DEVELOPING A HOMELESSNESS PREDICTION MODEL

by

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A thesis submitted to the University of Plymouth
in partial fulfilment for the degree of

DOCTOR OF PHILOSOPHY

School of Law and Social Science
Faculty of Social Science and Business

November 2008

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The purpose of this research was to produce a model to predict levels of homelessness within a local authority area. The research considered data on a wide range of issues embedded in theory and supported by the literature as being common precedents to homelessness. Areas of investigation included housing, migration, poverty, deinstitutionalisation, ethnicity, poor health, drug abuse, sex and age, relationship breakdown as well as general variables profiling the area. Data was compared both to the numbers of homeless decisions made within a local authority area as well as the numbers of those decisions that resulted in the full homeless duty being accepted. Multiple regression techniques and factor analysis were used to determine the issues most strongly correlated with levels of homeless decisions and therefore useful for the production of a prediction model. Models were produced for different types of council (e.g. borough councils, district councils, city councils etc) using different variables. A number of independent variables were identified as being reliable predictors for numbers of homeless decisions for two to three years into the future. These variables were the number of people experiencing limiting long-term illness; the number of people separated but not divorced; the number of under 18 conceptions; the number of people in receipt of income based job seekers allowance and the number of people of mixed race. In addition to these individual issues, a 'social disadvantage factor' combining all of these issues generally proved to be the most accurate and reliable variable for use in a regression model for predicting numbers of homeless decisions. Previous research in this area has been predominantly qualitative in nature. This study provides a new step towards a useable quantitative tool for prediction purposes. The models provide a level of objectivity to prediction and therefore have important implications for local government policy.

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Acknowledgements

Homelessness is not an easy or profitable business. It is hard to quantify and harder to deal with. The current support system is not adequate to fully respond to the issues and many people fail to receive the assistance they need due, predominantly, to resource constraints. A strong desire to improve this situation was the primary reason for undertaking this research. Local Authorities are swamped with demand and can struggle to respond effectively to the task in hand. There is very little time or money available to investigate possible ways to improve things. Homelessness is not generally an area that attracts interest or funding from industry and homeless people themselves have sufficient challenges to face each day without getting involved in potential improvements to the system. Even when there is a desire to improve things, the experience, knowledge or skill to move things forward is often lacking. I am in the privileged position of having extensive front line experience of working with homeless people and Local Authorities as well as research skills and experience. I have sufficient knowledge of the issues to be able to understand where some of the difficulties lie and I have a strong desire to improve the system for the benefit of both homeless people and Local Authority homelessness workers. I am therefore well placed to undertake such research which otherwise may not be undertaken.

This research would not however have been possible without the support from many individuals and organisations.

Firstly, I want to thank Plymouth University for the financial support given to me in the form of a university studentship and use of University resources. The research would not have been possible without their support. I would also like to thank Devon County Council for their support in the form of a disabled student allowance.

Secondly, I want to sincerely thank my two supervisors, Professor Malcolm Williams and Carole Sutton of Plymouth University. They have been very encouraging throughout this research. They have provided me with excellent guidance and advice and have spent many, many hours supporting me through the research. They have also been extremely patient and understanding about the personal challenges I have met on this journey. I am very grateful to them for their expertise, tolerance, humanity and humour.

I am also very grateful to the following Local Authorities who kindly took the time and effort to respond to my early questionnaire or provided comments on the summary findings of this research: Adur, Allerdale, Ashford, Aylesbury Vale, Barnet, Barnsley, Bath and North East Somerset, Blackpool, Blyth Valley, Boston, Braintree, Brent, Bridgnorth, Brighton & Hove, Bristol, Burnley, Bury, Camden, Caradon, Castle Morpeth, Charnwood, Chelmsford, Cherwell, Chester, Chesterfield, Chester-Le-Street, Chiltern, Chorley, Christchurch, Colchester, Cotswold, Coventry, Crawley, Darlington, Dartford, Derbyshire Dales, Durham, Eastbourne, East Cambridgeshire, East Hampshire, East Hertfordshire, East Staffordshire Borough Council, Eden, Enfield, Epsom and Ewell, Exeter, Forest of Dean, Gateshead, Great Yarmouth, Greenwich, Guildford, Halton, Hambleton, Harrogate, Hart, Hartlepool, Hastings, Hinckley & Bosworth, Horsham, Hounslow, Hunts, Hyndburn, Ipswich, Isles of Scilly, Kettering, Kirklees, Lancaster, Litchfield, Maldon, Manchester, Mansfield, Mendip, Mid Bedfordshire, Middlesbrough, Mid Suffolk, Mid Sussex, Milton Keynes, Mole Valley, Newcastle, North Dorset, Northampton, North Hertfordshire, North Norfolk, North East Derbyshire, North Warwickshire, North West Leicestershire, Norwich, Nuneaton and Bedworth, Oadby and Wigston, Pendle, Penwith, Poole, Purbeck, Redditch, Reigate and Banstead, Rochdale, Rotherham, Kingston upon Thames, Rugby, Rushmoor, Ryedale, Salisbury, Sedgefield, Sefton, Selby, Sheffield, Shrewsbury, Solihull, South Bedfordshire, South Cambridgeshire, South Hams, South Holland, South Norfolk, South Northamptonshire, South Oxfordshire, South Ribble, South Somerset, South Staffordshire, South Tyneside, Spelthorne, Stafford, Staffordshire Moorlands, St Albans, Stevenage, St Helens, Stockton, Stoke, Stroud, Suffolk Coastal, Sunderland, Swale, Swindon, Tamworth, Tandridge, Taunton Deane, Tendering, Tewkesbury, Thanet, Three rivers, Tonbridge and Malling Borough Council, Tower Hamlets, Trafford, Walsall, Warwick, Waverley, Wear Valley, Wellingborough, Welwyn Hatfield, West Lindsey, Westminster, West Norfolk, Weymouth, Whitehorse, Wigan, Wokingham, Worcester, Worthing, Wychavon. This research is richer and more relevant to homeless services as a result of the comments provided by the staff with in these Authorities.

Thanks also go to my previous colleagues at Shelter, who have provided me with copies of numerous research reports. They have also provided informed comments on issues raised throughout this research and I am grateful for their encouragement.

I also need to thank Alison Green and Professor Richard Wiggins who made valuable comments and suggested helpful amendments which have been incorporated into the finished document.

I would also like to thank Alison Forty for proof reading this research for me as well as my lovely family and friends who have provided much need practical support and encouragement throughout this research

Most of all I would like to thank my wonderful husband, Jim, who has supported me in so many ways; through this research and through some very dark days. Without his love, support and encouragement this research simply would not have happened. Finally, I would like to thank my beautiful daughter, Honey who, at the grand age of one, inspires me to try to make the world a better place.

AUTHOR'S DECLARATION

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Graduate Committee.

This study was financed with the aid of a studentship from the University of Plymouth.

Word count of main body of thesis: 97,690

Signed..

Dated... 28th November 2008

Chapter 1: An overview and introduction to the various perceptions of Homelessness

1.0 Introduction

The purpose of this research was to see if it was possible to predict with accuracy likely future levels of homelessness within a Local Authority area by approaching the problem from a broader perspective than simple housing need. In the author's experience, the homelessness services provided by Local Authorities across the country are often overwhelmed with requests for assistance from people in severe housing need. As a consequence, housing staff are often unable to provide an appropriate or effective level of assistance to all those approaching them for help. It would seem that this is due, at least in part, to a substantial mismatch between the level of severe housing need in a particular area and the resources allocated to deal with the problem. It is almost impossible to plan and fund services to deal with a problem effectively if the size and nature of the problem are unknown. The nature of homelessness is such that it is often hidden and has blurred boundaries. Further, the homeless are far from being a homogeneous group with similar needs, beyond the obvious need for improved accommodation. The homeless population are often excluded from society in other ways and cannot easily be identified from other lists such as the electoral roll or the council tax registers. Apart from the Council's own records of how many homeless households they have assisted in the past, which are themselves limiting, there are no reliable, valid and readily available assessments of the size of the homeless population. Homelessness can still carry a stigma of fecklessness and this can cause people to avoid engaging with support systems (Widdowfield, 1999; Pleace, 2000). These issues, among others, have made it extremely difficult for Local Authorities to accurately identify current levels of homelessness within a council's boundaries, let alone predict future levels of homelessness, secure appropriate resources to meet their statutory duties and effectively respond to the problem. There are many issues that are commonly considered as being associated with homelessness or as being causes of homelessness. These include individual characteristics such as poor mental health (e.g. Watson, 1999; Bhugra, 1996), or age (e.g. Lemos and Goodby, 1999, Somerville, 1998), as well as various social issues such as levels of poverty or deprivation in an area (Bruegal and Smith 1999; Birch, 1999; Foord, Palmer and Simpson, 1998). These associated issues are often better documented than homelessness itself and statistics can be readily available for the various subject areas. The hypothesis behind this research is then that it might be possible to predict likely levels of future homeless in an area by using available data on different personal and social factors which are often viewed as being associated with, or precursors to, the main issue of homelessness. The aim of this research is therefore to try to provide a tool for predicting need, for use by Local Authorities in the strategic planning of their services for homeless people. The objectives of the research will be:

- To provide some element of standardisation in the strategic approach to quantifying likely future levels of homelessness across the country.
- To facilitate resource management and planning around the issue of homelessness in each Local Authority area by providing a reliable, valid predictive tool to act as a keystone on which to build future plans.

- To provide a starting point for Local Authorities who may have difficulties in assessing and predicting need in this area due to lack of expertise, resources or political will by providing a simple formula to aid in the prediction process.
- To provide Local Authorities with a straightforward and easy to use independent measure which they can use to help explain or justify resource requirements or expenditure to funders, Central Government or other stakeholders.
- To improve services for homeless people across the country by enabling Local Authorities to take a more positive and strategic approach to the issue with a view to reducing social exclusion.

The research will examine available data on topic areas within Local Authority areas, comparing levels of homelessness in each Local Authority area with other key influencing factors [such as levels of poverty (Phelps and Carter, 2003; Randall and Brown, 1999), poor health (crisis, 1997; Dean and Craig, 1999) or educational attainment (Anderson, Kemp and Quilgars, 1993)] – both structural and individual, to determine whether there are any significant correlations or patterns that can be identified. Multivariate analysis will be used to explore relationships between factors and levels of homelessness. Statistical modelling will be employed and models will be tested for validity and reliability against historic information from Local Authority areas in the sample.

In order to investigate the above hypothesis, several matters need consideration. The remainder of this chapter therefore briefly considers the phenomena of homelessness; what the causes could be and how the public perception of homelessness can frame the response to the issue. The chapter suggests that homelessness is likely to persist and probably increase in the near future and that the cost of this to society is substantial. The chapter looks at the general definitions of homelessness and focuses specifically on who the Local Authority councils should be considering as homeless as detailed in the Homelessness Act 2002, together with the extent of their responsibilities to individuals depending on how they are classified. Some of the challenges to quantification and measurement are raised and discussed. The chapter then concludes that homelessness of varying degrees can affect a significant proportion of the population. Therefore, a wide and inclusive definition and response is likely to be the most effective in addressing the issue.

1.1 Homelessness

1.1.1 Overview

Homelessness is an ongoing phenomena in the United Kingdom as it is in other parts of the developed and developing world. Whilst in some circumstances, such as economic migration in developing countries, it can be perceived by its population as a chosen positive step towards a better life (Speak, 2004), in a developed society it is very rarely experienced as a state derived from positive choice. Throughout the developed world, there are wide differences in the responses to homelessness. This leads to each country quantifying the issues differently (Brousse, 2005). Indeed, at the extreme, in Malta for example, there is no official recognition of homelessness, no definition and therefore no social policies to deal with the issue (Vakili-Zad, 2006). In the United Kingdom, some individuals do view a nomadic or unencumbered existence as their preferred lifestyle, and such people do not choose to engage with services or safety nets designed to provide more permanent housing. The large majority of homeless individuals do however need or want varying degrees of assistance to help change their housing situation and their lives generally. Although the popular perception has been that people often choose to be homeless, this infers a positive move when in fact, the choice of homelessness is often the lesser of two evils. If the physical and emotional traumas and challenges of being homeless are perceived as the best choice available for an individual surely it is important to consider what the alternative choices might have been before society declines any responsibility to help. Our society is accustomed to seeing people living rough, literally having nowhere to go and having to sleep on the streets (Rough Sleepers Unit, 1999 & 2001), The fact that many people live in overcrowded, insecure accommodation which is unsuitable for their needs seems to be an accepted part of everyday life. It remains however a concerning fact that a significant proportion of the population seem to be unable to access or sustain appropriate accommodation despite there often being many empty properties in the urban areas of the country.

There is a growing awareness that homelessness needs to be viewed in its widest context if solutions are to be found. There is some belief that existing approaches to understanding and responding to homelessness actually do not explain very much at all and that there are, in reality, no universal truths relating to homelessness (Neale, 1997). Pleace (1998) acknowledges this view and goes further arguing that homelessness should not be regarded as a discrete problem or phenomenon in itself that must have causes, but rather as a symptom of the much wider issue of social exclusion. He suggests that homelessness can be understood as a set of consequences that arise when social exclusion occurs in a context within which little or no assistance is given to those who experience it (Pleace, 1998). The argument that homelessness is not a single definable issue but is instead a symptom of other social problems suggests that the homeless are not a group of individuals sharing the same circumstances and characteristics but are instead people in many different housing situations, experiencing different and often wide ranging problems or difficulties. There is no one set path to becoming homeless and experiences that may cause homelessness for one person may not do so for another. (Williams and Cheal, 2001). Homelessness can be seen as a label of convenience attached to a collection of symptoms of the failure of social systems. This suggests that homelessness is not the problem that needs addressing.

There is support for such a view in social theory. Burchardt, Le Grand and Piachaud (2002) accept that cultural factors do influence life choices. However they highlight that choices are made in the context of how much financial capital (financial assets or liabilities), physical capital (ownership of housing or land) and human capital (e.g. childhood circumstances, family, health, poverty, education and training) an individual may have at the time. They also suggest that choices are made in the context of the circumstances that surround individuals; their individual and family circumstances, the circumstances of the community in which they live as well as national and global circumstances. Burchardt et al argue that all these issues need to be combined to provide a full explanation of poverty and social exclusion. This idea equally applies to providing an explanation of homelessness, considered as a symptom or manifestation of social exclusion. It follows then that eradication of issues such as homelessness would require a comprehensive, wide reaching approach to stand a chance of success.

Whilst this wider contextual platform for homelessness does provide a more realistic base from which to progress, to dismiss homelessness as a symptom rather than a problem in itself that needs addressing is simply not practical in the short to medium term. To suggest that homelessness is not a real phenomena could be seen as an academic debate which ignores the harsh realities of a lack of a home. Whilst this argument may in fact be a reality, such compartmentalism is arguably necessary as a starting point to tackle the complexity of social problems.

Although it is acknowledged that the solution to homelessness is likely to lie in a fundamental shift of societal attitudes and beliefs, this somewhat utopian picture may take generations to achieve and does not provide an adequate response to homelessness in this decade and the next. What can be taken from such insights is that perhaps a more positive response to homelessness could be achieved if it is considered within the context of the wider issues of current society.

1.1.2 Definition and legislative context

Definitions of homelessness cover a wide spectrum of situations from rooflessness to those who may have accommodation which is unsuitable or inadequate in some way. Some definitions include those who may be overcrowded or have limited security of tenure in their accommodation (Bramley, 1988). Indeed, the whole issue of who is defined as homeless and who isn't remains contentious. This is emphasised by Springer who states that there are as many classifications and definitions of homelessness as there are different points of view (Springer, 2000, p.479). Minnery and Greenhalgh agree that effective policies addressing homelessness need to be based on a clear definition but that policy approaches across Europe, the United States and Australia are extremely varied. However, this research is concerned with English Local Authority practice in relation to homelessness so it makes sense to work with the definition which is relevant to them. This is the legal definition together with the associated guidance. The legal definition is contained in part VII of the Housing Act 1996 as amended by the Homelessness Act 2002. The current statutory definition is very specific and defines who should be considered as homeless by the Local Authority and exactly what levels of assistance have to be provided by the authority to the homeless person seeking assistance. The main definition of homelessness is contained in section 175 (1) of the Housing Act 1996 which states that a person is homeless if he has no accommodation available for his occupation, in the United Kingdom or elsewhere which he is entitled to occupy by virtue of an interest in it, a licence to occupy it or he occupies by virtue of a rule of law. The legislation goes on to define this statement further and say that accommodation will not be considered as being available for occupation if a person can't secure entry to the accommodation or if it's a moveable structure and he has no-one to place it. Finally, the law states that a person shall not be treated as having accommodation unless it is accommodation which it would be reasonable for him to continue to occupy. This section of the definition is perhaps the most subjective area as opinion will inevitably vary about when it is considered reasonable to occupy accommodation. The detail of the legislation is contained in Appendix 5. The individuals who can satisfy the legal definition of homelessness are considered as 'statutory homeless' and people who fall outside of this specific definition are generally termed as being 'non-statutory' or 'hidden homeless' and have very limited rights to assistance. The situation is further complicated by the fact that the law goes on to define what mandatory responses the Local Authority must provide to people who satisfy the definition and this obviously has resource implications. A person seeking assistance under the legal provisions for homelessness must satisfy a number of criteria before securing aid in the form of housing from the Local Authority. In particular, before they can qualify for permanent housing they have to satisfy the Local Authority that they are eligible for assistance, in a priority need category and not intentionally homeless. If these factors can be proven, the Local Authorities have to provide temporary accommodation as an emergency response if necessary and then permanently rehouse those individuals or households who can fully satisfy the criteria. This can be a costly venture. For those people who satisfy the statutory definition of homelessness but who the Local Authority consider are not in a priority need group, very little help is available. Whilst these individuals are entitled to receive advice and assistance from the Local Authority this often manifests as the simple provision of a list of local private sector landlords despite these individuals being in dire housing need and often roofless. Although Local Authorities do have the discretionary power to provide housing to this group, pressure on available resources often prevents this from happening. The priority need groups were extended by the Homelessness (priority need for accommodation) (England) Order 2002 which came into force on 31st July 2002. However, even if priority need can be established, if the Local Authority consider that an individual is homeless as a result of their own action or inaction, the Council's responsibility is only to provide temporary accommodation for a reasonable period of time (usually 28 days) and the legal responsibility toward them can then usually be discharged. As the legislation is open to interpretation, guidance has been issued by Central Government on how the specific provisions relating to homelessness should be interpreted but this guidance is just that, and is not enforceable. Whilst the law does try to bring clarity to the situation, there is still room for wide interpretation by Local Authorities and this can lead to different practice across the country and a disparity in who is counted as homeless and who isn't and perhaps more importantly, what level of assistance is provided.

In addition to nationwide legislation defining homelessness there have been extensive policy initiatives from Central Government to encourage Local Authorities to be more proactive and consistent in their approach to dealing with homelessness. The Rough Sleepers Initiative (1990–2002) and the more recent Coming in From The Cold (1998-2002) and Bed and Breakfast initiatives (2001-2004) are probably among the most notable, with such initiatives often being driven by financial incentives or penalties for the Local Authority. One of the more recent attempts to effectively tackle the problem has been through extending the priority need categories under the Housing Act 1996 and by directing Local Authorities to take a more strategic look at the problem with the introduction of the Homelessness Act 2002. The legislative framework for homelessness was substantially revised by The Homelessness Act 2002 which received Royal Assent on 26th February 2002. This legislation requires Local Authorities to provide advice and assistance to a wider range of people than ever before. It also directs Local Authorities to carry out a homelessness review for their district (section 1(1)(a) of the act) and to formulate and publish a homelessness strategy based on the results of that review (Section 1(1)(b) of the Act). Additionally, Local Authorities are required to review and revise this strategy at least every five years. Section 2 (1)(a) of the Act specifically states that the levels, and likely future levels of homelessness in the district need to be considered in the review. The purpose of this requirement is detailed in section 2(1)(2) of the Act and is to prevent homelessness in the district, to secure that accommodation is or will be available for people who are or may become homeless and to provide support for people in the district who are or may become homeless or who have been homeless and need support to prevent them becoming homeless again. This change to the legislation has arguably substantially widened the definition of homelessness with which Local Authorities have to work and is more in line with the United Nations definition of homelessness which includes adequate protection from the elements, access to safe water and sanitation, affordable prices, secure tenure and personal safety as well as accessibility to employment, education and health care (United Nations, 1984).

Whilst campaigning voluntary sector agencies such as Crisis, Centrepoint and Shelter are accustomed to working to wider definitions, such as those that include individuals who may be staying with friends or relatives on a temporary basis as well as those who have very limited security of tenure such as lodgers or tied workers, this approach is alien to Local Authorities who have historically been bound to the narrower definition contained in the legislation. Consequently, Local Authorities are now having to make a fundamental shift in their culture to embrace the wider perspective encouraged by the current thinking of Central Government, statutory framework and guidance. In the analysis of responses to consultation on proposals for a national homeless strategy, there was a recognition that a wider definition needs to be adopted if Local Authorities are to be able to effectively respond to the problem. There was also a call for greater consistency in the definition of homelessness between authorities. The issue of determining the size of the problem of homelessness is hampered from the outset by differing interpretations of what situations are considered to be 'homeless' and definitions being widened. Until there is an agreed consensus of definition which remains stable over time, agreement on the overall size of the homelessness problem is likely to continue to be problematic.

1.1.3 Government guidance

Guidance for identifying people at risk of homelessness (Rough Sleepers Unit, 2001) identifies trigger factors – situations that might lead to homelessness such as relationship breakdown or eviction; welfare factors – personal issues that might increase the risk of homelessness such as mental ill health or lack of coping skills; and protecting factors – the extent of links within the local community which could help prevent homelessness, such as support from family and friends or links with supportive organisations. Trigger, welfare and protecting factors are highlighted as indicators of potential risk of homelessness, with guidance stating that each of these factors need to be balanced to determine the risk. The guidance does not however provide detail on how to quantify or balance these issues. Indeed, in a report for Shelter Local Authority views about the usefulness of guidance produced by the ODPM were mixed (Dudleston, Alty & Henthorne, 2004). Central Government guidance to the recent changes (DTLR, 2002b) states that Local Authorities' own records of its activity under the homelessness legislation "will provide a baseline for assessing the number of people who are likely to become homeless and seek help directly from the Housing Authority". These 'own records' generally refer to the P1E returns which are official figures used by Central Government for monitoring purposes and are considered in the chapter three. As a starting point this is fine; however it is well recognised that these statistics provide at best, a partial picture of homelessness in contemporary society (Cloke et al, 2000b). Further, Crisis highlights that "official statistics are not a reliable measure of the problem of single homelessness" (Kenway & Palmer, 2003) due to numerous problems of methodology and accuracy, more fully detailed by Widdowfield (1998) and discussed earlier.

The guidance goes on to list other "useful sources of data" on homelessness including rough sleeping records, estimates of people staying with friends, court records on possessions, records of eviction from registered social landlords, local advice service records, hospital records of people homeless on discharge, armed forces records of those homeless on discharge, prison / probation service records of ex-prisoners homeless on discharge, social services records of homeless families with children, social services records of young people leaving care and children in need requiring accommodation and records available from hostels and refuges. The guidance acknowledges that some groups of people are likely to be at more risk of homelessness than others and states that "all these factors will need to be taken into account when assessing likely future levels of homelessness in the district". Whilst the Rough Sleepers Unit report seems to acknowledge that the report is just a starting point (RSU, 2001), it neither contains nor points to any specific guidance about *how* figures on these issues should be taken into account.

The guidance from the Rough Sleepers Unit (2001) is undoubtedly rooted in a body of what is predominantly qualitative research. The idea of triggers has been mooted previously by Crane (1997, 1999), Randall and Brown (1999) and Connolly (1994) and there is a glut of research on the various issues commonly associated with homelessness; health (Dean and Craig, 1999; Gill et al, 1996), poverty (Birch, 1999, Brandon, 1974) de-institutionalisation (Hutson & Liddiard, 1994; Van der Ploeg & Scholte, 1997: DTLR, 2003) as well as ethnicity (Allard et al, 1995*)*, drug abuse (RSU, 2001; O'Leary, 1997) and a general lack of support or connection with society (Dant & Deacon, 1989; Shinn, 1997; Giddens, 1994; May, 2000). Local Authorities do seem to be taking these ideas on board to some extent, for example, as part of their review of homelessness in their area, Great Yarmouth analysed homeless applications and applications to direct access hostels and were able to identify trigger factors which included mental health, low income, substance misuse, crime, low educational attainment, lack of social skills and factors such as youth, gender and physical disability Great Yarmouth Borough Council, 2002). However how such information translates into useable figures that can inform local planning is still very muddy waters. Research in America by Shinn et al (1998) also identifies several possible predictor variables for homelessness, many of which echo those highlighted in the UK. In particular, domestic violence in adulthood, family disruption in childhood, mental illness, youth, education, work history, having been a teen mother, substance abuse, imprisonment, health problems, housing supply issues and overcrowded housing conditions all were shown to reliably contribute to the prediction of homelessness (Shinn et al 1998). This body of research has undoubtedly increased awareness of the issues surrounding homelessness and informed policy and practice within the field. It has also informed the development of legislation (Homelessness Act 2002) as well as guidance to the legislation (Office of the Deputy Prime Minister, 2002a).

1.1.4 Causes of homelessness

The causes of homelessness in developed countries have been much debated over the last three decades (Pleace, 2000) and the issue of causality remains disputed. Opinion has historically been spilt between predominantly 'structural' explanations which essentially suggest that homelessness is a result of a breakdown of support systems and structures within society (May, 2000, Drake et al, 1981, Avramov, 1995, 1996), 'individual' explanations that suggest homelessness is a result of some individual vulnerability or inadequacy, perhaps leading to unhelpful lifestyle choices, such as drug use (Carlen, 1996; Daly, 1996a) or issues around relationship breakdown (Burrows, 1998, Barter, 1996), or alternatively, 'political' explanations which point to a lack of willingness to address the issue (Shinn, 1997). Research by Bassuk & Rosenburg (1988) and Goodman (1991) comparing homeless people with low-income, housed people failed to find differences between individuals' education levels, mental health states and support networks. In contrast, research in the early 1990's highlighted that alcohol abuse problems are more severe among homeless than marginally housed individuals (Welte & Barnes, 1992). Such individualistic arguments fail to explain issues such as episodic homelessness. Caton goes further by suggesting that individual pathologies lead to a predisposition to be affected by structural factors (Caton, 1990) but these attempts to explain homelessness in relatively simplistic terms have led on to a realisation that homelessness is in fact a very complex issue which is inherently difficult to define, explain, quantify and deal with (Neale, 1997, Burrows et al., 1997; Pleace, 2000, Giddens, 1984, Fitzpatrick, 2005). Research in America has tried to clarify and conceptualise the interactions between individual issues, circumstances and availability of resources and how they contribute to a situation of homelessness yet there remains a "*fair amount of mystery concerning the life course of the chronically homeless adult*" (Sosin, 2003). There is however reason to believe that the reasons for homelessness in America and Britain may be different, due to real differences in the nature of homelessness and the social and economic systems in the two countries (Fitzpatrick, 2006). In Britain, there does now appear to be a general acceptance that the explanation of homelessness lies in Britain's social, economic and housing market structures. This is of course with the acknowledgement that structural circumstances also influence the micro-level, creating individual pressures and constraining individuals' ability to change or resolve difficult housing situations. (Anderson & Christian, 2003; Pleace et al, 2008).

1.1.5 The issue of cause and effect

In order to establish causality there needs to be a non-spurious relationship between variables and evidence that the cause precedes the effect. The argument as to whether the associated social issues lead to the homelessness or whether homelessness leads to the compounding debilitating circumstances is impossible to answer in the absence of longitudinal research spanning periods before, during and after the homelessness. Such an approach in itself is recognised to be particularly problematic when dealing with the issue of homelessness and the specific difficulties with access and continuity of contact (Sosin et al, 1990; Conover et al, 1997; Hutson, 1997). It has been suggested that an alternative approach would be to undertake research using the accurate recall of the participants to investigate the causal factors. Again, this is not without its problems, with accurate recall often being hampered by a lack of time frame markers for participants who have been homeless for long periods, together with a lack of willingness to disclose or recall traumatic events or genuine memory loss experienced due to a history of drug or alcohol dependency or mental health problems (May, 2000).

Researchers have attempted to distinguish between cause and effect with little success. Bines (1994), for example, confirms a strong relationship between homelessness and ill health but clearly highlights that cause and effect are difficult to disentangle. Whilst some research clearly points to mental ill health as being a preceding factor to homelessness (Hartman, 1984, Weller and Weller 1986), other research indicates that high levels of psychiatric symptoms were the result of, rather than the cause of, homelessness (Westlake and George 1994). In addition, there will of course always be a number of extraneous factors to consider that may have contributed to the situation of homelessness, again Bines' research (1994) highlights that a high proportion of single homeless people who had been in a psychiatric hospital had also spent time in other institutions, particularly prison or remand centres. The measurement problems are further compounded by the need to disentangle the effects of the particular issue, say drug abuse, from those of related life-style issues or from life events that may have led to the substance abuse. Further, any one combination of factors that might have led to homelessness for one individual would not necessarily have the same affect for another (Akiyu, 1992; Watson & Austerberry, 1986).

The issue of cause and effect also has to be considered in the wider context of the debate of social theory and the extent to which the structures of society are considered responsible for the situation of the individual. Marxists for example see society as resting on an economic base and see human behaviour as essentially being determined by the control and structure within society. They tend to view poverty and social exclusion (and therefore homelessness) as inevitable consequences of capitalism which won't be removed without transformation of the structures of society (Marx and Engels (1950, first published 1848). Such a conflict perspective considers that it is the failure of society to allocate resources and provide opportunities fairly that explains the problems of poverty and social exclusion (Haralambos and Holborn, 2004) and therefore would provide the explanation for homelessness; a manifestation of social exclusion. The views of Marx are reiterated to some extent by contemporary sociologists. Barry (2002) highlights that although the choices of individuals can influence the degree to which they are excluded, the existence of inequality tends to provide systematic patterns of social exclusion. In a capitalist society goods and services are allocated through the market place and those who cannot afford them will tend to become socially excluded. In this context, capitalism can therefore be seen as the underlying cause of homelessness. In his writings on the rules of sociological method Durkheim argued that society has a reality of its own over and above the individuals who comprise it and dysfunction of society (manifesting in such symptoms as homelessness) arises when the moral obligations that constrain individuals and regulate their behaviour are not strong enough to function effectively (Durkheim, 1938, first published 1894). In this context, homelessness would therefore be seen as a consequence of the collective consciousness being insufficiently cohesive to oblige individuals to work together for the benefit of the whole. The cause of homelessness would not be seen to be the fault of the entity of society, but rather the result of the cummulative actions of the populous that contributed to that society. Murray takes this argument further suggesting that there is an underclass within Britain that is actively undermining the fabric of British society. He considers that there is a growing trend amongst the poor to adopt a way of life including dependency on state benefits, crime, unemployment and illegitimacy and it is this anti-social attitude that is at the root of societies problems (Murray 1989). From this perspective, the cause of homelessness would lie clearly with the attitudes and behaviours of the poor. This view does however receive extensive criticism (Walker, 1990; Heath, 1990, Deakin, 1990). In light of the above, it seems that determining the cause of homelessness depends not only on the qualitative evidence that supports associations with other social issues but also on the sociological perspective adopted. The debate about cause and effect would therefore appear to be inconclusive.

1.1.6 Past research

Research into the issue of homelessness has been overwhelmingly qualitative in nature (eg. Cloke, Milbourne and Widdowfield, 2001; Lemos and Goodby, 1999; Crane, 1999, Anderson, Kemp and Quilgars,1993). It is also noted that there is a serious lack of statistically robust quantitative studies in published research (Anderson & Tulloch, 2000). The extensive and predominantly qualitative research has historically focussed on profiling the homeless population leading to the identification of common characteristics of homeless people (Kemp, 1997; Goering et al, 2002; Burrows, 1997; Anderson 1994; Pleace & Quilgars, 1999) consequences of homelessness for society and the individual (Hutson and Clapham, 1999; Avramov, 1999) and an awareness of some of the circumstances that can precede homelessness (Anderson and Christian, 2003; Clapham, 2003, Mojtabai, 2005; Ji ,2006). However there is an acknowledgement that there is often little analysis of the wider social, political and economic contexts within which homelessness is created and sustained (Anderson, Kemp & Quilgars 1993). Research has tended to be dominated primarily by a single disciplinary focus (Christian, 2003), with research in the UK and Europe focusing on a predominantly housing studies perspective (Klinker and Fitzpatrick, 2000), influenced by the work of sociologists (Jacobs et al, 1999) and research in the US being focused on a clinical psychological perspective (Shinn, 1997) again, being complemented by some sociological input (Shlay and Rossi, 1992; Sosin, 1992). To some extent, research in America has focussed on the individualist approach to defining homelessness whilst research in Europe has been more focussed on structural factors (Christian, 2003).

The research that has been conducted has led to the identification of risk factors, trigger factors and some of the safety nets that can help to prevent homelessness. This approach of focussing on a combination of issues around homelessness rather than a narrow, more stereotypical framing has been useful for directing policy and practice (Randall and Brown, 1999) and has helped to place homelessness in the wider context of social exclusion. However, this still has not resulted in the ending of homelessness and the problem continues to prevail.

1.1.7 Political will and Local Authorities' perception of the causes of homelessness

The causes of, and responses to, homelessness are, in part, undoubtedly framed by the political climate of the time. Homelessness is a politically sensitive issue. To acknowledge homelessness, where housing is seen as a basic right of citizenship, is to suggest a failure of the Government to support citizens or that the social system is failing (Jacobs, Kemeny and Manzi, 1999). In the 1980's, under a Conservative government that promoted a market economy, emphasis was on the agency of undeserving or feckless individuals being the cause of their homelessness, rather than a failure in the housing system to accommodate the circumstances of people becoming homeless (Anderson & Christian, 2003; Cloke, Milbourne & Widdowfield, 2001). This shifted towards the end of the 1990's under a Labour Government and a broadly structural explanation of homelessness became predominant (Third and Yanetta, 2000).

In the homeless reviews and strategies produced by Local Authorities in July 2003, the most common reasons recorded for applicants becoming homeless are stated as being relationship breakdown of some sort and the ending of an assured shorthold or other private sector tenancies. The breakdown of relationships as a major cause of homelessness is also widely recognised by the research community (Kennedy & Fitzpatrick, 2001; Bruegal, 1999; Burrows, 1998) Whilst there is widespread recognition that these reasons may be the presenting causes after a long chain of difficulties, historically there appears to have been little attempt made by Local Authorities to record or look further beyond these preceding difficulties with a view to using the information to improve service provision. Central Government have acknowledged that this is the case and admit that they "know relatively little about the personal, social and economic circumstances of homeless families and other vulnerable people accepted by Local Authorities for housing" (DTLR, 2002a). It is recognised that this blinkered approach will need to be addressed in the longer term if strategies to tackle homelessness are to be successful. Indeed, Central Government's homeless strategy does attempt to 'tackle the wider symptoms and causes of homelessness including action on health, employment, relationship breakdown, services for children and other associated issues' (ODPM, 2005b, c & d).

1.1.8 The wider context

These issues are not new, nor are they specific to the United Kingdom. In looking at the situation across Europe, Fitzpatrick draws on the definition of homelessness employed by FEANTSA and highlights how homelessness in the European Union is normally attributed to the changing nature of housing markets, poverty and unemployment, the increasing individualisation of society, migration, and the deinstitutionalisation of psychiatric institutions. Although the varying emphasis placed on structural and individual factors in explaining homelessness in different member states is noted (Fitzpatrick, 1998). This call for a wider perspective is echoed by Polakow and Guillean (eds), who look at homelessness around the world. While they comment on the fact that homelessness in its various forms is obviously a housing issue and requires a response in terms of housing, they suggest that a rethink of the philosophy underlying several interrelated areas of public policy, namely work, housing and demography will be necessary before unmet housing needs and difficulties can be dealt with effectively in the longer term (Polakow and Guillean, 2001).

1.1.9 Economic factors

Unquestionably, national and global economic factors have generated major structural changes within society (Edgar, Doherty and Meert, 2002a; Steering Committee on Social Policy, 1993), including the collapse of the British manufacturing industry for example. Inevitably, these national and global issues impact on levels of public spending and have led to a weakening of the welfare support systems (Foord, Palmer and Simpson, 1998). The consequences being that there is a new and increased risk of poverty and homelessness for the mass of the population (Speak, 2004; Kennett and Marsh, 1999). If the proportion of homeless people within society rises, it is reasonable to look to the support structures within that society for an explanation of the rise rather than attribute the rise to the individual characteristics of those within the population who are homeless (Wright Mills, 1959). In the United Kingdom, not only have the support systems been reduced but the remaining services are often financially stretched and unable to provide the help that is needed. In fact, the way that resources are apportioned and distributed within existing social systems may actually be causing some incidents of homelessness. For example, housing provision for the young is geared to those leaving home for positive reasons, therefore arguably, young people who leave home for more negative reasons will be at greatest risk of homelessness (Jones, 1993). Crane and Warnes also suggest the causes of homelessness to be a result of a failure of the welfare state and, specifically, its safety nets (Crane an Warnes, 1999).

This idea is supported by the Pan-London Providers Group (2004) among others, which highlight how homelessness is caused or exacerbated by the inefficient housing benefit system. In particular, housing benefit capping of benefit levels for those under 25 and systems delays can result in rent arrears and lead to homelessness. This issue is evidenced to the House of Commons by Thames Reach Bondway (2004) who view the delay in the processing of housing benefit claims as the clear cause of homelessness in some cases.

1.1.10. Ineffective service provision and the placing of homelessness within societal systems.

Support agencies that fail to actively co-operate with other agencies and departments or narrowly define their boundaries in respect of clients with dual diagnosis may also be contributing to homelessness among the most vulnerable in our society. A lack of resource availability in social services departments may be contributing to the over-representation of care leavers amongst the homeless population. A report by Munn (1996) highlights how stays in different types of institutions can contribute to homelessness and how this might be prevented through improvement in service provision. Another concern is institutionalised racism in homeless departments. That is the existence of systematic policies and practices within an institution that have the effect of disadvantaging certain racial or ethnic groups (Macpherson, 1999). Such policies and practice can contribute to black and minority ethnic homelessness. In some areas this is exacerbated by very short notice periods by agencies such as NASS, and together, such issues can lead to disproportionate levels of homelessness amongst people with leave to remain in the UK.

There is some evidence to suggest that homelessness can arise as a result of multiple difficulties; not necessarily due to the difficulties themselves, but as a consequence of the problems that those experiencing this issues have with accessing services effectively. With different agencies being unwilling or unable to accept responsibility for assisting the individual, referring them on to other agencies, resulting in them often falling through society's support net (Goldfinger et al, 1999; Zlotnick, Robertson & Lahiff, 1998, Watson, 1999). Often, if an individual has multiple issues to deal with and is in contact with a number of agencies for support, a lack of joined up working between those agencies can exacerbate the difficulties faced by that individual, particularly if they are unable to juggle the contact and actions required. This has shown to be a particular issue with ex-offenders who also have mental health problems. In a pilot project by St Giles Trust, homelessness was often prevented if someone was able to take on a co-ordination role on behalf of the person experiencing difficulties (Currie et al, 1997). In fact, research tends to support the view that 'consistent associations between experience, characteristics and structural factors and entering homeless have not been demonstrated' (Pleace, 2000, p592).

The issue of societal systems actually causing or contributing to homelessness is not a new phenomena. In 1971, Glastonbury identified the ineffectiveness of Case Co-ordinating Committees working with homeless people as being due to inter-professional distrust and an unwillingness to share information (Glastonbury, 1971). Lemos also points to the inadequacy of the social housing system, with its exclusionary policies and inequities as a contributory factor in sustaining homelessness (Lemos, 1999). A report for Crisis stated that social security policy – designed to provide a financial safety net – has time after time undermined efforts to provide solutions for single homeless people. It then goes further, to say that social security policy was a major driver of the upward trend in homelessness in the mid and late 1980s and was likely to be so again in the late 1990s (Foord, Palmer and Simpson, 1998). Perhaps ironically, an alternative position heralded by right wing strategists such as Charles Murray and Lawrence Mead agrees that the social support systems are perpetuating homelessness, not by their inefficiency or restrictive practices but instead as a result of their mere existence and, essentially, the unconditional support they offer to homeless people (Humphreys, 1999). However it is difficult to see how such arguments can hold true when in places such as South America and Africa for example, where social support systems do not exist or only exist in a very minimal form, people still become and remain homeless. Whilst it is arguably difficult to include such issues in a statistical model, addressing these service issues could potentially significantly reduce the levels of homelessness. Central Government acknowledge that homelessness crosses departmental and institutional boundaries. In April 2001 took steps to change the way such services are funded by creating a single pot for capital finance at local government level, to allow greater opportunity to mobilise resources to tackle cross-service issues (King, 2001). Later fundamental reforms of Local Authority finance have also gone some way to promoting a more joined up approach to public and social policy; however interagency and interdepartmental collaboration on complex issues such as homelessness remains a challenge to the majority of Local Authorities (Dudlestone, Alty and Henthorne, 2004).

1.1.11. Desire for change

Whatever the causes may be, homelessness is seen as a problem which needs to be resolved. There is a recognisable desire across society to deal with the problem – for various reasons, not all of which are positive. Although thinking has arguably moved on from the seventies when Conservative MP Hugh Rossi referred to homeless people as scroungers and scrimshankers, the idea of homeless people as being undesirable is still apparent. In the 1990's a Conservative Minister (Sir George Young) famously referred to homeless people as the people you step over coming out of the Opera House. In what is considered to be a developed society, having people sleeping on the streets is, at best, sometimes viewed as an embarrassment which we are often reluctant to acknowledge and in the words of previous Prime Minister, Tony Blair, "*can blight areas and damage business and tourism*" (Social Exclusion Unit, 1998). A more positive response from society stems from a desire to raise standards across the whole of society or comes from a moral position that homelessness is simply unacceptable. Amongst other things, such thinking has promoted the growth of national charitable organisations such as Crisis www.cris.org.uk, Centrepoint www.centrepoint.org.uk, and Shelter www.shelter.org.uk who work towards finding solutions to homelessness by providing front line aid to homeless people as well as improving knowledge of the issue and the people affected by it and lobbying government for change.

1.1.12 Financial implications

One key reason for wanting to put an end to homelessness is financial. Since 2002 Central Government have invested more than £400 million in trying to tackle to the issue (Department for Communities and Local Government, 2006a;

Pawson et al, 2007). There is a recognition that it is costly to society for an individual to become or remain homeless and that money could be saved and better spent elsewhere if homelessness could be prevented or dealt with efficiently when it occurs. This idea that the desire to eradicate homeless is predominantly driven by economics rather than a moral benchmark for society is well established (O'Flaherty, 1998). In 1998 the audit commission estimated that each tenancy failure could cost a Local Authority £2000, including unrecoverable arrears, legal costs, lost rent on an empty property and the cost of dealing with the subsequent homeless application. The Audit Commission estimated that it cost approximately £5000 to resettle someone with mental health problems into social housing after a tenancy crisis and hospitalisation (Audit Commission, 1998). Youth Offending Teams estimate that over 8000 young people receive custodial sentences because their housing is unsuitable, at a cost of £16 million (Youth Justice Board, 2005). In their review in 2002, Bexley Council estimated that homelessness would cost the council an additional £1million in 2006/7 if they were unable to reduce the demand and increase the supply of both permanent and temporary accommodation (Bexley Review 2002). Another example of financially driven solutions is in Brighton and Hove, where the Local Authority employed four support workers to prevent homelessness in their district. The annual wages of these workers were recovered in full within six months by the money saved by Local Authority homelessness service as a result of the efforts of the support workers (RSU, 2001). Other costs that need to be considered are the financial costs to society in terms of benefit payments, the cost to the health service in dealing with this high need group and the increased financial burden on social care services. In their report for Crisis, Kenway and Palmer made a number of assessments of the estimated cost of differing homeless scenarios, the lowest cost of a homeless situation being estimated at £4,500 and the highest cost for a single incidence of homelessness being costed at £83,000 (Kenway and Palmer, 2003). Such figures did not try to encompass the cost of the impact of homelessness on the individual which could potentially be enormous. Not only is the opportunity cost unquantifiable but the potential long term physical or emotional damage and trauma to the individual, together with the challenges involved in reintegrating into mainstream society, are very difficult to ignore. While there may be plenty of debate around the causes of homelessness, what does not seem to be in dispute is that it appears to be in everyone's interest to resolve the problem of homelessness whether it is for the benefit of the homeless individual, society as a whole, or particular individuals or groups within that society.

1.1.13 Future outlook

In 2001 government measures indicated that homelessness was continuing to rise and Central Government expected homelessness to continue to increase over the following years (DTLR, 2002a). This proved to be the case as demonstrated by the Local Authority homelessness reviews published in July 2003 as well as by written evidence provided to the House of Commons by numerous Local Authorities (Calisle, Southampton, South Ribble, Wycombe, Yorkshire and Humberside, Bury, Salford, Kensington and Chelsea, Lewisham, Bolton, Gateshead, Crewe and Nantwich, Haringey, Norwich, Brighton and Hove, York), and organisations such as the National Probation Service, Shelter, The National Rent Deposit Forum, The Disability Rights Commission, The Salvation Army, Housing Justice, (ODPM, 2004f) and other written statements by Central Government (ODPM, 2003c; ODPM, 2004g). Since 2004, Central Government report a consistent and continuous fall in the numbers of homeless applications to Local Authorities (Department for Communities and Local Government, 2006a, b, & c, 2007b & c) although whether this is reflective of a general downturn in homelessness or a change of approach in the management and recording of people who approach Local Authorities for help with housing crisis is an issue for debate. Even the Governments own figures recognise that rough sleeping has not been significantly reduced since 2003 (Department for Communities and Local Government, 2007b & d). By June 2008 the 'credit crunch' had caused tens of thousands of homeowners to fall into a situation of negative equity with no sign of a reprieve. The credit crisis had pushed up the cost of mortgages and first time buyers needed to find increasingly large deposits to obtain a mortgage (Wallop, 2008). These issues add further pressure to the housing situation in England and are likely to contribute to increased levels of homelessness in the future.

The Barker Review of Housing Supply acknowledged that the demand for housing was increasing over time, driven primarily by demographic trends and rising incomes, yet construction of new homes in the UK in 2001 fell to its lowest level since the second world war (Barker, 2004). The increase in house prices in the UK is estimated by Barker to be 2.7% per annum, far in excess of house price rises in Europe which Barker estimates to be 1.1%. Barker suggests that to redress the imbalance between supply and demand for housing and bring the UK real house price trend in line with the rest of Europe, an additional 120,000 homes per annum over and above those already planned, would be required. Whilst such a statement implies that a large increase in new build would essentially address the problem of homelessness in this country it does oversimplify the situation. There are areas in the north of the country that have high levels of empty homes whilst at the same time high levels of homelessness and housing need. Barker however does not consider the wider issues associated with homelessness and, at best, additional new build could only assist at a macro level by pushing down house purchase and rental costs by increasing supply. This however assumes a perfect market where differences would level out and, in such circumstances, any affordable housing would be unlikely to remain affordable.

The Government acknowledged the need for more housing and in particular more affordable homes but only committed themselves to building an extra 10,000 social homes a year until 2008 (Department of Communities and Local Government, 2006b). Based on the projections of insufficient housing supply and increasing demand for the period up to 2021, the UK is inevitably going to experience an increasing volume of unmet housing need and homelessness. Whilst the obvious issue of supply and demand for housing cannot be seen as synonymous with homelessness, the availability and cost of housing must be seen as a factor in the homelessness debate. Without significant additional action taking the form of proactive and realistic attempts to address the issue of homelessness and unmet housing need, there will inevitably be an increasing number of households who are insecurely or inadequately housed and who would therefore fall under the various definitions of homelessness. The phenomena of homelessness shows no sign of being eradicated and could indeed be on the increase if Barker's projections hold true, despite the best endeavours of well meaning individuals, organisations and Central Government.

However measures to address the situation are severely hampered by the many problems involved in defining, quantifying and measuring homelessness.

1.2 Challenges of quantification and measurement

1.2.1 Official figures

Whilst much research has been conducted into the nature and needs of single homeless people, what is missing is an accurate assessment of the extent of the problem (ODPM, 2001b). Even with clear definition, determining accurate levels of homelessness, particularly single homelessness, in an area is recognised as being notoriously difficult to quantify and there is widespread agreement that there are no valid figures of 'unofficially' homeless persons (Crane and Warnes, 2001;). Even the figures on 'official' homeless persons – those meeting the criteria of being statutory homeless, are widely acknowledged as being unreliable. These official figures are the figures used by Central Government for monitoring purposes and are known as P1E returns. However it is recognised that "*official homelessness statistics provide at best, a partial picture of homelessness in contemporary society*" (Cloke et al, 2001) and are not, on their own, sufficient to comprehend the nature of homelessness (Greve et al, 1996). Further, Crisis highlights that "*official statistics are not a reliable measure of the problem of single homelessness*" (Kenway & Palmer, 2003) due to numerous problems of methodology and accuracy, more fully detailed by Widdowfield (1998) and discussed later, but essentially due to a wide disparity in interpretation of the legislation and recording practices across the country. The problems of measurement were also stressed in the responses to consultation on proposals for a national homeless strategy which highlighted that problems with enumerating the extent of homelessness were thought to stem from the lack of a coherent definition for non-statutory homelessness (ODPM, 2000). The problem is even acknowledged by Central Government who recognise that official statistics remain inadequate and that there is a paucity of reliable data (House of Commons Committee of Public Accounts, 2005)

1.2.2 Political agendas

The quantification issue is further exacerbated by political agendas of both statutory and non-statutory agencies working in the field of homelessness, with definitions being honed or restricted for political or resource purposes (see Hutson and Liddiard, 1994; Hutson & Clapham, 1999 and Williams, 2005 for a full discussion of these issues). These problems of definition and quantification aren't limited to the United Kingdom – the problems of definition and measurement are also documented throughout Europe (Avramov, 1999) where "*few national or local governments keep any usable or consistent statistics on the national level of homelessness*" (Harvey,1999), America (Quigley, Raphael & Smolensky, 2001) and Australia (Chamberlain, 1999) to name but a few. Perhaps as a result of these difficulties, there has been very little quantitative work on estimating the size of a homeless population in a given area (Williams and Cheal, 2001). The predicament therefore remains that it is difficult to urge governments to meet the needs of homeless people if the parameters of the homeless population are unclear (Chamberlain and Mackenzie, 1992). However, to focus on debates of definition and quantification would be to accept a discursive stalemate which is unacceptable given the injustices of homelessness (Cloke, Milbourne and Widdowfield, 2001). Instead, a focus on improving understanding would seem to be a more helpful approach to the difficulties.

1.2.3 Estimation of the size of the problem

Whilst it is generally believed that, depending on the definitions used, homelessness only directly affects a very small percentage of the population, there is evidence that it could affect 4% of the UK population (Burrows, 1997) and figures for homelessness in America that suggests the figure could be as high as 14% (Phelan and Link, 1999). In their report for Crisis, one estimate by Kenway and Palmer suggested that a rough estimate for the magnitude of single homelessness within England was 2.5% of the population in London, 1% in the rest of the South and 1.5% across the Midlands and the North. Estimates based on use of emergency shelters in the United States are in general accord with these figures, suggesting that homelessness can affect up to 2.1% of the overall population (Metraux et al, 2001). The research in the UK suggests that even in small authorities, there will be a significant number of single homeless people, for example, in the low hundreds even in small rural districts (Kenway and Palmer, 2003, p44). These estimates for single homelessness are of course only part of the picture and consequently, Kenway and Palmer recommend that *"Local Authorities must ensure that they are gearing themselves up to operate on a scale that will allow then to tackle the full extent of the homelessness problem"* (Kenway and Palmer, 2003, p44).

1.3 Conclusion

Homelessness affects many populations around the world. The causes of homelessness are varied and complex and can vary from country to country and from individual to individual, resulting in a lack of consensus amongst academics and practitioners about the issue itself and how best to respond to the problem. There is a vast amount of research on the issue, profiling homeless people, looking at causes and consequences, as well as monitoring the success or failure of various interventions. This body of research is however predominantly qualitative in nature and quantitative research to determine the size of problem is very thin on the ground in comparison. This is probably due in part to the problems of defining the concept of homelessness and where the line is to be drawn between the homeless and those in housing need. The size of the problem will of course depend on definition. This is widely contested, with voluntary sector agencies tending to advocate for a wide and inclusive definition and statutory agencies, who have the legal duty to deal with the issue and pick up the bill, preferring to keep the numbers as small as possible. What is clear is that Local Authorities are likely to have to deal with increasing numbers of homeless people in the coming years, due amongst other things, to the insufficient new-build plan, changes in household composition and a widening safety net imposed by changes in the homelessness legislation. Another certainty is that homelessness is expensive, both in terms of responding to the issue as well as the opportunity cost to the individual and to society.

There is a wide variation across society in general and Local Authorities in particular, of how best to define, measure and predict levels of homelessness with a Local Authority area. The legislation defines who the Local Authorities have to help and to what extent but this legal definition can be interpreted differently and variations in interpretation between different councils lead to inconsistency in service provision across the country. How strictly the legislation is interpreted will, to some extent, be framed by local politics, local budgets and subjective judgements about who is deserving and who is undeserving. How the concept of homelessness is defined and perceived will inevitably direct how it is quantified and explained as well as how society responds to the phemonena (Pleace, 2000). Whether it is considered primarily as the fault of the individual or primarily the fault of society, will affect how it is managed. As highlighted by Clapham (2003), adopting either a minimalist or maximalist discourse of homelessness will inevitably frame the policy responses to the issue. The law and guidance from Central Government encourage Local Authorities to adopt a wider interpretation of homelessness and this is supported by social theory. There remains however a wide variation in practice and a lack of consensus on how best to approach the issue. The legal definition of homelessness needs to be interpreted in its widest sense if appropriate resources are to be allocated to the issue. Even if there is a clear definition without ambiguity and subjectivity, reliable and valid measurement techniques will still be required before accurate estimates can be obtained for effective strategic planning. Whilst there is a common perception that homelessness only affects a very small minority of the population, it would appear that the reality could be significantly different. What is perceived to be a very small issue is likely to attract a very small budget. Central Government acknowledge that, despite the aims of the Homelessness Act 2002, it appears that many Local Authorities still display a lack of strategic thinking when dealing with homeless people (House of Commons, Office of the Deputy Prime Minister, 2005). Until Local Authorities are able to accurately predict likely levels of future homelessness in their area, strategic planning of services for homeless people is likely to be severely hampered, to the detriment of homeless people as well as society in general.

Chapter 2: Key influences on the risks associated with becoming homeless

2.0 Introduction

This chapter looks at the evidence supporting correlations and links between homelessness and other social phenomena. Research which examines the profile of homeless people clearly highlights that certain factors are over represented in homeless populations. Whilst it cannot necessarily be said that particular issues are the causes of homelessness there are clear indications that certain precedent conditions can potentially significantly increase the likelihood of becoming homeless. This view is supported by Kisor & Kendal-Wilson whose research revealed no definitive path to homelessness but identified patterns that could inform policy responses (Kisor & Kendal- Wilson 2002). This opens the possibility that it might be feasible to use statistics held on these commonly precedent factors to predict likely levels of homelessness. This chapter discusses why it might be appropriate or useful to try to quantify and predict homelessness by looking at other issues which have traditionally been associated with the risk of becoming homeless. The chapter reviews the evidence supporting links between homelessness and other social issues that could potentially be included in a predictive model and tries to identify whether the associated issue could be said to precede homelessness rather than be caused by it. The issue of migration and how it relates to homelessness is also considered. The subject areas discussed are all of the issues commonly highlighted in the literature on homelessness. It is acknowledged that, whilst the subject areas covered are wide reaching, the evidence presented in the literature may be incomplete and, as a consequence, pertinent issues may be omitted from analysis and subsequently from the development of a prediction model. The chapter concludes that there does appear to be sufficient evidence to support the idea of a predictive model.

2.1 General demographics

In addition to the general issues highlighted in the literature and detailed further below it is possible that the general characteristics of an area will, to some extent have an affect on levels of homelessness. The fact that an area may have a high population may be an indicator pointing to higher numbers of homeless people. If homelessness affects a minimum of 1% of the population (see chapter 1) then figures for homeless people in the area should arguably increase as the population increases. This will of course be affected by other issues such as the levels of, and opportunities for, development of housing within the area. If an area has limited space available and a high population for example, there is likely to be increased pressure on housing supply, more competition and possibly higher levels of homelessness.

2.2 Housing issues

Not surprisingly, there has been extensive research relating to homelessness undertaken in this area as, by definition, homelessness is directly related to housing need. The research includes both quantitative and qualitative studies (Klinker and Fitzpatrick, 2000; Quigley, Raphael and Smolenksy, 2001; O'Flaherty, 1996) and looks at assessments of the housing market, access to housing, evictions, affordability, isolation and resettlement needs and how these issues relate or contribute to homelessness. The national charity, Shelter, believe that housing is the main structural issue in relation to the causes of homelessness (Shelter, 2004). This view is supported by some sociologists who suggest that homelessness is the obvious result of the planning policies in Britain preventing people from building a home where or how they can (Spicker, 1988). Research in America also suggests that a weakening of housing codes to increase the availability of inexpensive, low-quality rental housing would help to reduce the size of the homeless problem (Early, 1999). However if the housing was of low quality it is questionable whether such action would resolve homelessness in its widest sense.

Research by Randall and Brown (1999) highlighted that 37% of the rough sleepers surveyed had held Council or Housing Association tenancies at some stage and lost them. This would suggest that the concept of homelessness encompasses a lot more than simply not having access to suitable accommodation. Whilst eviction can be a contributory cause of extended homelessness, there is debate over whether it is a primary issue. Some authorities suggest that eviction per se plays a relatively minor role in causing homelessness (Crane and Warnes, 2000a), arguing that issues such as retirement or redundancy, death of the last surviving parent, widowhood and marital breakdown, the increase in severity of a mental illness and coping difficulties can all provide a significant contribution to eviction and ultimately to homelessness. They highlighted risk factors which included issues such as a defective housing benefit or other benefit claim as well as living alone. These findings support other research which points to issues such as poverty and lack of support rather than eviction itself as being the more relevant causes of homelessness. However, Central Government still hold the view that eviction and housing pressures are some of the main causes of homelessness both in

England and the rest of Europe (Department for Communities and Local Government, 2006a).

There is some evidence that the closure of casual accommodation and resettlement units in the 1980's, with only slow replacement of those direct access beds lost, has been a major cause of homelessness (Foord, Palmer and Simpson, 1998). Bhugra (1996) echos these findings, identifying such issues as having international relevance. Recent research in Ontario, Canada also highlights that discharge from psychiatric wards direct to shelters or to the streets is still a regular occurrence (Forchuk et al, 2006). There is little disagreement that changes in the supply of, and the demand for, housing as well as changes in the structural systems of housing can affect homelessness levels (Jacobs et al, 1999, Crane and Warnes, 1999; Anderson, 1994) and that these causes of homelessness are widely acknowledged across Europe (Avramov, 1995 &1996) and America (Sosin, 2003.). Indeed, some authorities consider the lack of affordable accommodation to be the fundamental cause of all homelessness (Fisher and Collins, 1993; Drake et al, 1981). High rents for the lowest level of housing has been put forward as a key cause of homelessness in America (Early, 2005) but such a structuralist view has been challenged by others who instead encourage a more individualistic explanation (Main, 1996). Certainly, the lack of affordable, adequate accommodation was highlighted as the central reason for youth homelessness in a report for Shelter (Dibblin, 1991) but it was not the only reason, with child abuse also being found to be a major factor. Abuse was also found to be a direct cause of young women's homelessness by Hendessi (1992). Further, whilst the Chief Executive of Crisis agrees that homelessness may have historically been a supply side problem 20 years ago, she states that this is now misleading and is an oversimplification of the reality of current homelessness (in foreward to 'A Future Foretold', Lemos and Goodby, 1999). Indeed, in Lemos and Goodby's research, only 8% of the reasons given for becoming homeless were housing related (Lemos and Goodby, 1999). Further, Lemos points out that by considering homelessness as simply having nowhere to live suggests that the overriding need is only to provide somewhere to live (Lemos, 1999). The evidence of many homeless people alongside many unlettable vacant properties within social housing stock in towns and cities in the North of England dispels this myth and as Lemos states, homelessness should instead be considered rather as a metaphor for many other problems. This suggestion that there should be less of a focus on housing issues when considering homelessness is supported by research by Hampton, Heller-Dixon and Langham (2002) which failed to demonstrate a predictive influence of house prices, interest rates or rents on homelessness figures. In December 2000 the European Council approved a European Social Agenda which included the implementation of National Action Plans to combat social exclusion. For the first time, these action plans included a housing dimension by making explicit reference to the need to establish the right of access to decent, affordable housing. In 2002 FEANTSA reviewed these plans and concluded that by simply focussing on quantity and quality of housing supply, nations had failed to recognise that an effective policy requires an integrated approach across all different levels (prevention, emergency response, integration), spheres (housing, jobs, mental, physical and psychological health etc), groups (young people, women, men, immigrants, drug and alcohol abusers etc) and their respective needs (FEANTSA, 2002, p3). In FEANTSA's view then, a predominant focus on housing does not provide an effective way forward for addressing homelessness. Whilst then housing must be considered as a potential indictor it should by no means be the predominant factor in a model to indicate homelessness.

2.3 Poor health

Homelessness has historically been associated with mental health problems, with the perception that a large proportion of the homeless population have either refused to engage with appropriate mental health services or have been abandoned or erroneously discharged from mental health service provision. In particular, as discussed above, the closure of large mental health hospitals is often blamed for the increase in homelessness over the past couple of decades. However research in England as well as the United States challenges such arguments (Pickard, Proudfoot and Wolfson, 1992; Abdul-Hamid, 1999; Sosin, 2003), suggesting that those individuals with chronic mental illness are likely to have been accommodated elsewhere and it is more likely to be people who are on the fringes of mental health assistance, who have not had long stays in mental health hospitals, that fall into homelessness and whose mental health difficulties subsequently escalate (Dean and Craig, 1999). This view is supported by Crisis who suggest that only 1-2% of those released from long stay mental health institutions go on to sleep rough (Crisis, 1997) as well as research by the Department of Health which provides the figure of one in five of the homeless people surveyed having spent six months or more in hospital (Craig, et al, 1995). There is certainly evidence which suggests homeless people experience more mental and physical health problems than comparable, housed populations (Bines, 1994; Bhugra, 1996; Pleace and Quilgars, 1996) and that the proportion of the homeless population experiencing these difficulties is high. This link is recognised by the Audit Commission who make reference to effective liaison with strategic health authorities and primary care trusts in their checklist for preventing homelessness (Audit Commission, 2003). A study of homeless service users across metropolitan France found that the proportion of the population of homeless people experiencing mental health problems was high with almost a third of the population studied having spent at least one night in hospital during the year (Insee 2002). This high proportion of the sampled homeless population experiencing mental health problems is supported by research by Gill et al (1996). However, conversely there is also research which challenges the assumption that young homeless people were more likely to experience mental health problems than those living in disadvantaged communities (Commander et al, 1998). Whilst homelessness clearly cannot be defined by mental health concerns alone, there is a compelling large body of research that points to a high incidence of mental health difficulties amongst the homeless population (for example: Fisher and Colins, 1993, Watson, 1999; O'Leary, 1997, Baker, 1997; Gill et al, 1996). Randall and Brown (1999) suggest that as many as 60% of rough sleepers may have mental health problems. There is also a large body of evidence which highlights the high incidence of poor physical health amongst this population (Bines, 1994; Citron, Southern and Dixon, 1995; Connelly and Crown, 1994; Crane and Warnes, 1997; Grenier, 1996; North, Moore and Owens, 1996; Pleace and Quilgars, 1996; Walley, 1994). Evidence suggests that single homeless people face a higher risk of death and disease than comparable housed people (Connelly and Crown, 1994), it is more difficult for homeless people to access health service and that problems of continuity of care can make long term treatment challenging (Collins, 1997; Fisher and Collins, 1993, Grenier, 1996). A study by Reid and Klee of young homeless people and service provision (1999) highlights that although GP registration was relatively high (78%), registration had generally been made as a child and the GP practice was often in a different area of the city than where the young person was currently living. These issues may lead to health problems amongst the homeless population going undiagnosed, untreated or becoming compounded or entrenched. This may in part, explain why there is a prevalence of health difficulties amongst this population in comparison to the general population who may experience comparable challenges but are more likely or more able to access health services, treatment, convalescence opportunities and care.

The fact that both physical and mental health are likely to suffer when someone experiences homelessness is not disputed (Knight, 1994;) and a study by Blaire and Wrate (1997) found a significant correlation between the duration of homelessness, a history of depression and a history of suicide attempts. Whether it is the lack of a home that causes the health difficulties or the health problems that lead to the homelessness can be difficult to disentangle, however there is some clear evidence that poor health, particularly mental health, can be a contributory factor on the road to homelessness. Kisor and Kendal-Wilson (2002) found, amongst other things, that mental health problems were a precursor to homelessness. Further, in a report of a working party of the Royal College of Physicians, it was noted that the effects of mental illness in combination with social and economic problems, can trigger housing crises that may lead to homelessness (Connelly, 1994). Central Government has also acknowledged that mental ill health can lead to homelessness (DTLR, 2002a).

Research in Australia clearly demonstrates that, in the population of homeless mental ill people, the mental health difficulties precede the homelessness in the majority of cases (Taylor, 2008). Whilst it is acknowledged that there are many people with poor health who manage to sustain accommodation and avoid homelessness, Crisis argue that community mental health teams have a poor record in identifying housing problems as a priority issue and this shortfall in failing to spot housing problems at an early stage, can quickly lead to homelessness if left unrectified (Dean and Craig, 1999). Central Government also recognise the fact that a lack of awareness or knowledge amongst the care team when a person is admitted into hospital can actually cause homelessness. People can slip through the net as a result of an uncoordinated or ill-informed discharge plan or as a result of illegal eviction action by private sector landlords whilst an individual is in hospital (Crockett and Spicker, 1994; ODPM, 2005c & d). This is particularly the case for short term admissions to hospital where staff can have very limited incentive and very little time to get a full picture of someone's housing, instead concentrating resources on their field of expertise (which often doesn't encompass housing) and the immediate health needs of the patient (Franklin,1998).

2.4 Ethnicity

It is widely acknowledged and accepted at central and local government level that black and minority ethnic households are over-represented among England's homeless population and that rates of homelessness are disproportionately high among the black and minority ethnic population (ODPM, 2005b & e). This is also the case in America (Osterberg & Barr, 2007). People from minority ethnic communities have long experienced social exclusion in relation to housing (Sim, 2000). Daly argues that the link between immigration and homelessness is essentially through poverty and xenophobia (Daly, 1996). This view is supported by European research which suggests that, in comparison with the indigenous population, immigrants to the European Union are more likely to occupy poorer housing and pay a disproportionate share of their incomes to acquire it (Edgar, Doherty and Meert, 2004). This situation seems to be getting worse rather than improving. Shelter reports that in the six years between 1997 and 2004 total homelessness acceptances by English Local Authorities increased by 34% but the figure for non-white, black and minority ethnic households rose by 77% (over twice as fast). The research also noted that there was a particularly sharp increase in homelessness amongst black African / Caribbean households (Shelter, 2004e). The fact that this issue has been highlighted by the Government's official figures is a particular cause for concern, given that it is acknowledged that such figures cannot provide a comprehensive picture and consequently underestimate the size of the homeless problem. Research suggests that a black head of household is three times more likely to have experienced homelessness than a white head of household and attributes this to structural and demographic forces, racialised practices and events as well as household strategies, preferences and constraints (Harrison, 1999). Central Government also recognise that people from ethnic minority populations are three times more likely to become statutorily homeless (ODPM, 2005b). Other research confirms the overrepresentation of black and minority ethnic groups within the homeless population. In looking at the plight of homeless children and young people, Allard et al (1995) conclude that people from ethnic minorities suffer disproportionately from homelessness and wait longer to be rehoused. Further, in a study of black and minority ethnic homelessness in London, this group formed a disproportionate number of those found homeless in London boroughs (Carter, 1998). The issue is not confined to England. African Americans were overrepresented in the sample of older homeless women in America and were considered to be more vulnerable to homelessness than their caucasian counterparts (Kisor & Kendal-Wilson, 2002). This is supported by Early (2004) who argues that the race of the household head is an important determinant of whether a household is homeless.

The causes of homelessness among black people have been found to be similar to those for white people (Julienne, 1998) however the reasons for the disproportionate levels of homelessness amongst these communities are not as obvious. There is some suggestion that the problems experienced by black and minority ethnic groups are compounded by the location of households in over-crowded inner-city areas with housing stress and higher unemployment rates (Julienne, 1998). This idea is supported by Central Government who have stated that black and minority ethnic households are at least seven times more likely to live in overcrowded conditions than white households (ODPM, 2000 & 2001a & b). A number of other factors that might be contributory have also been mooted; black and minority ethnic households are more likely to be socially excluded (Shelter, 2004e), they are more likely to be unemployed (ONS, 2002), have a low income (ONS, 2004), and more likely to live in poor housing conditions (ODPM, 2001a & b). In addition, racial harassment is likely to be a major cause of black and minority ethnic homelessness and racial discrimination within the housing and homelessness system is also viewed as contributory to the problem (Shelter, 2004e).

The way in which homelessness is currently enumerated also provides a distorted picture of homelessness amongst people from the black and minority ethnic communities. For example, research shows that people from this group are less likely than their caucasion counterparts to sleep rough (Davies et al, 1996; Webb, 1994). This group are therefore likely to be underrepresented in rough sleeper counts which can heavily influence homeless policy and resource distribution in a particular area. This undercounting of the size of the problem of homelessness amongst those from black and minority ethnic groups points to there being an even greater disproportional representation of such communities in the homeless population across the Country than is currently evidenced by official figures.

There is some support for the view that disproportionate levels of black and minority ethnic homelessness may be in part due to the fact that the National Asylum Support Service (NASS) are only required to provide a week's notice to leave once people have been granted refugee status or leave to remain in the UK. This is often not enough time to secure alternative accommodation and consequently people end up applying for assistance under the homelessness legislation (Shelter, 2004e). The immigration procedures also appear to contribute to homelessness by generating a clandestine population that are classed as illegal immigrants and are forced to live outside the law and the protection it offers against unscrupulous employers and property owners (Edgar, Doherty and Meert, 2004).

2.5 Poverty

Many profiles included in the research of homeless people highlight the fact that they are a population of low income (Insee, 2002;). By definition, this situation is likely to have been existed prior to the homelessness. If money was not an issue for these individuals it is likely that they would have been able to buy a new home or rent alternative accommodation when their homelessness arose. It is widely accepted that poverty is the single most common characteristic of homeless people (Anderson & Christian, 2003; Niner, 1989; O'Callaghan et al, 1996; Anderson, Kemp & Quilgars, 1993). 26% of people surveyed in research by Randall and Brown highlighted money problems as a reason why they first slept rough (Randall and Brown, 1999). Research by Early (1999) suggests that males with low incomes and high levels of depression are more likely to become homeless. A similar theme is echoed by Mojtabai (2005) who suggests that most homelessness is a direct result of insufficient income, unemployment and a lack of suitable housing and that structural solutions of increased availability of low-cost housing and income support would reduce the risk of homelessness. Central Government guidance to social landlords on using eviction orders as a last resort highlights that over 26,000 social housing tenants are evicted annually, mainly because of rent arrears (ODPM, 2005a). The Citizens Advice Bureau reported that rent arrears were the main reason for eviction, accounting for as much as 95% of all evictions in England and Wales (Phelps and Carter, 2003). This is supported by research for Shelter that identifies a range of circumstances which may lead to homelessness including mortgage problems, rent arrears, housing benefit delays, making the transition from prison or care and domestic violence (Birch, 1999). Experiencing difficulties with paying a mortgage or paying rent could obviously lead to loss of accommodation and Central Government clearly link these issues with a likely increase in homelessness (DTLR, 2002a). However, these circumstances usually arise as a consequence of poverty or debt and it is therefore a low income rather than accruing housing costs which could arguably be said to be the cause of homelessness in such incidents. This view is reiterated in a study in the United States which clearly identifies poverty as the key determinant of homelessness (Ji, 2006). Going one step further, in a review of the literature surrounding exits from and returns to homelessness, Wong notes that being in receipt of income maintenance benefits and subsidised housing appear to be the most consistent predictors of homelessness (Wong, 1997). Foord, Palmer and Simpson go further still and suggest that it is in fact social security policy that is the underlying cause of homelessness. They suggest that social security policy drove the increase in homelessness in the mid to late 1980s and argue that housing benefit changes of 1996 and 1997 had a similar effect (Foord, Palmer, and Simpson,1998). These systems are designed for, and accessed by, people who are struggling financially to meet their basic needs, people experiencing poverty. Changes in these support systems are then, by definition, inevitably going to affect the poor within society and arguably could lead to homelessness.

Additionally, Crisis identifies the relationship between homelessness and employment as being particularly important (Kenway and Palmer, 2003) and highlights that unemployment has been identified as one of the key structural factors in the growth of youth homelessness, due to young people experiencing severe disadvantages in the labour market. The consequential economic difficulties young people face are exacerbated by a lower national minimum wage, restrictions in benefit entitlement and the fact that many young people have not had the opportunity to acquire savings to cover such things as deposits and rent in advance (Shelter, 2005). This view, that unemployment is a key factor and potential cause of homelessness, is also strongly advocated by Hudson (1998) and Burrows (1997). It is also a position which is emphasised by May in his research exploring the pathways into homelessness. May found that almost all the homeless men in his research had experienced numerous episodes of homelessness throughout their lives and had simultaneously been either long-term or permanently unemployed (May, 2000). Long term unemployment and general deprivation were also highlighted as significant issues by Bruegal who found that young homeless people were more likely to come from poor backgrounds, broken homes and excluded from school (Bruegal, 1999). Arguably, this would also support the idea that homelessness can stem from structural decline in the economy.

2.6 Relationship breakdown

Central Government consider family and relationship breakdown to be the biggest cause of homelessness in England (ODPM, 2003c). Whilst this statement is likely to be based on the information provided by the P1E returns and is therefore in part, a result of how the statistics are collected, the literature does support the view that relationship breakdown can be a key factor in the run up to homelessness. Butler (1993) highlights that relationship problems are a primary reason why women become homeless. This is supported by Kisor & Kendal (2002) in their study of older homeless women in America. Their research also highlights that single people generally are more susceptible to homelessness as they have no-one to help them sustain accommodation when financial difficulties arise. The idea that an increase in homelessness can be attributed to social trends such as high divorce rates, separation, family conflict and break up is echoed by sociologists (Blakemore, 2003, Murray, 1989) and adds support to Durkheim's theory of social integration. Unlike many of the other issues discussed in this section, relationship breakdown is much more easily seen as a cause or at least a precursor to homelessness and has found to be the main cause of homelessness in a number of studies (Burrows, 1998; Davies, 1996; Emmaus, 1998). Indeed, research in Greater Manchester, found disputes with parents or partners to be the most common cause of homelessness, totalling a half of all reasons (Carlisle, 1993). The idea of relationship breakdown being a major cause of homelessness has been further evidenced in recent research for the Department for Communities and Local Government by Pleace et al (2008).

The term 'relationship breakdown' covers a wide variety of situations, from disagreements with parents, relationship difficulties with partners and even death of a family member or friend. Disputes with parents and step parents were highlighted as a reason for sleeping rough by 33% of homeless people in research by Randall and Brown (1999) and family breakdown due to abuse or violence was even more common, with 40% of homeless young people giving this as a reason for their rough sleeping (Randall and Brown, 1999). Perhaps a better term would be 'breakdown of the family home' as put forward by Crane (1999) who suggests that breakdown of the family home, mental illness, vulnerability interacting with stress as well traumatic and stressful events can all lead to homelessness, particularly later in life. Further research by Crane and Warnes adds weight to this view, highlighting that the ending of important relationships, whether through death or relationship breakdown, can also be a forerunner to homelessness amongst older people if dependency is high. They highlight that the relationship does not necessarily have to be with a spouse or partner but could equally be with a co-resident parent (Crane and Warnes, 2000b; Warnes & Crane, 2006). Hawes also finds the most common cause of home loss in later life to be related to relationship breakdown, adding the issue of intergenerational family disputes to the debate, highlighting that disputes with adult co-resident family members can sometimes involve domestic violence and can also be a cause of homelessness for the older person (Hawes, 1997). This issue of problems with other co-residents as a cause of homelessness amongst older people is supported by Rota-Bartelink and Lipmann (2007) and Crane et al (2005).

There is some limited evidence that the absence of important relationships can also extend to whether someone has a relationship with a god, in relation to their risk of becoming homeless. This may be because an individual feels the support of greater forces than their own inner resources and this provides additional hope and resilience through challenging times (Lindsey and Williams, 2005). This issue has links with Durkheim's theories regarding social solidarity and the role of religion in industrialised society. (Durkheim, 1961). According to Durkheim, religion was the basis for the collective conscience – the shared moral beliefs and values of a society. He also believed that in an industrialised society with a highly specialised division of labour, religion would lose some of its importance as a force for integrating society and that a specialised division of labour could encourage excessive individualisation (Durkheim, 1947). It follows then that, if religion does not have a strong influence within society due to being sidelined by other social structures, and social solidarity is not being sufficiently sustained through labour structures due to excessive individualisation, society will start to crumble. From this perspective, the link between the lack of a belief in a god and homelessness may not be so surprising. However, this hypothesised link between homelessness and no belief in a god may also simply be due to the lack of additional practical support one can potentially obtain from a religious community. Alternatively, the link may be due to unknown extraneous factors; we can of course only speculate as to the reasons for the connection. There is however surprisingly little research looking specifically at the connection between homelessness and having a religious belief and this hypothesised link is therefore currently limited in its usefulness in terms of model development.

A more spurious issue connected to the idea of relationship breakdown is the apparent absence of a positive relationship between a homeless applicant and council homelessness staff. If there is tension between the applicant and the council the applicant may come to believe that the council is either unwilling or unable to help. This perception that the system cannot or will not help with someone's homelessness may be enough in itself to perpetuate feelings of hopelessness and ultimately homelessness. Indeed, there is some support for this position in research into the links between homelessness and suicide where it was evidenced that indifferent and poor treatment when applying for housing and social security can cause great distress (Baker, 1997). There is also evidence to support the idea that a breakdown of welfare systems and support services can be a direct cause of homelessness, particularly for older people (Warnes and Crane, 2006; Crane et al, 2005). There is some evidence in medicine and theological literature which points to hope being a positive force for change (Buchholz, 1990; Carson et al, 1988) and there are many documented incidences demonstrating that a positive belief can affect outcome, the placebo effect being the most obvious (Fulder, 1996; Frank and Frank, 1991; Ogden, 2000). In "Head First – the Biology of Hope", Cousins states that patients will tend to move along the path of their expectations (Cousins, 1989). Whilst this is in the context of recovery from ill health, the concept is transferable to other areas of an individual's life, including their housing situation. If staff attitudes and systems within a local authority homelessness department can convey hope and positivism to an individual applying for assistance, this might in itself bring about positive change in the applicants life. There is some academic support for this idea in the field of homelessness (Partis, 2003). Conversely, if the applicant has no faith that the system will help resolve the homelessness, the lack of faith might actually prove to be an obstacle to the resolution of the homelessness.

Relationship breakdown is also seen as a common cause of youth homelessness, and research by Caskie notes that an underlying cause of youth homelessness is a young person leaving home when family support networks breakdown. Family breakdown is also considered both a risk factor and trigger in making a young person homeless in research by Kenway and Palmer (2003). It is arguably of no surprise that homelessness can affect young people as they may not have the support, resources, experience or knowledge to enable them to solve their housing difficulties independently. Youth homelessness is often attributed to relationship breakdown or lifestyle choices. In a study by Smith et al (1996) it was estimated that in British cities, 1 in 20 young people will present to agencies as homeless. The crisis point of a young person leaving the family home is often due to parental conflict and sometimes due to unacceptable behaviour by the young person (Taylor-Seehafer, 2001); however research by Smith, Gilford and O'Sullivan suggests that whatever the case, young people do not usually walk away from the family home but feel forced out (Smith, Gilford and O'Sullivan, 1998). This view is supported in research for the Children Society which states that problems in the family are the main reason for young people running away, with abuse being an important factor (Safe in the Streets Research Team, 1999). In Smith, Gilford and O'Sullivan's research (1998) two-fifths of young homeless people reported either long-term abuse from within their families or violence in the household. Childhood abuse or neglect are commonly cited in the literature as precursors to homelessness (Hyde, 2005; Tyler, 2006, Yoder et al, 2001; Robert, 2005;) Randall and Brown (1999) add weight in support of these issues as precedents to homelessness, as do Bruegel and Smith (1999) who cite household friction as the reason for a young person leaving home. This is again a common theme in the literature (Robert, 2005; Keys et al, 2005; Rosenthal et al, 2006) and is recognised be Central Government who have recently been promoting the idea of 'buddy' mentors and family mediation for young people experiencing personal difficulties or family breakdown (Department for Communities and Local Government, 2007e & f & 2008). Caskie also highlights that while family breakdown may be the trigger into homelessness, issues of youth poverty, lack of affordable housing opportunities as well as support needs due to a lack of personal resources and experience compound the difficulties and prevent swift resolution to the homelessness (Caskie, 1993). Evans also draws attention to the many social policies and structures that can exacerbate youth homelessness (Evans, 1996).

Disruption of family life in childhood can also disrupt education, particularly if difficult behaviour results in exclusion from school. There is evidence that only 38% of people sleeping rough have any qualifications compared to 66% of people in the general population (Anderson, Kemp and Quilgars, 1993). Research by Randall and Brown supports the idea that exclusion from school heightens the risk of homelessness, finding that 28% of their sample had experienced such exclusion. (Randall and Brown 1999). Further, Jones points to the specific issue of housing provision for young people being geared towards those who leave home for 'positive' reasons rather than as an 'escape' and consequently, those young people who are perceived as running away from something face the greatest risk of homelessness (Jones, 1993).

Relationship breakdown manifesting as domestic violence is also noted as a key cause of both initial homelessness and repeat incidents of homelessness. Research by Shelter reported that 40% of homeless women stated that domestic violence was a contributor to their homelessness. Domestic violence was actually cited as the single most quoted reason for becoming homeless. (Shelter, 2002). In other research in Scotland, a study of repeat homelessness found that relationship breakdown involving domestic violence was seen as the key cause of repeat homelessness (Scottish Homes, 2001). Domestic violence and family breakdown have also been highlighted as the major causes of women's homelessness in the west by Charles (1994) and Hague, Malos and Dear (1995). In research by Lemos and Goodby (1999) over half of their respondents ascribed their homelessness at least in part to the breakdown of a relationship or to losing a partner. They often walked away from their home due to being unable to cope. Under the current legislation, their actions would usually cause them to be defined as intentionally homeless and they would therefore experience problems accessing social housing in the future.

2.7 Sex and age

Quantifying homelessness and rough sleeping in particular is often on the basis of service use. Nationally there are nine hostel places for males for every one female place. This inevitably results in the greatest number of homeless being identified in areas and among groups (usually males) for whom provision is already made. With limited provision, women tend to adopt alternative strategies for dealing with their homelessness such as staying with friends, staying in abusive relationships or even prostitution (Cloke, Milbourne and Widdowfield, 2001). If young women are homelessness and feel they have little choice but to prostitute themselves to obtain shelter, it should be no surprise that teenage pregnancy rates are high amongst this population. There is however a common perception that young women get pregnant deliberately to jump the housing queue although the evidence does not in any way substantiate this claim. The reality is that teenage pregnancies are more likely to arise as a result of irresponsibility or a lack of awareness, support or maturity. Indeed, the DTLR have recognised that teenage pregnancy can often both be a cause and consequence of homelessness (DTLR, 2002b). However, in contrast to this view, research by Smith, Gilford and O'Sullivan (1998) suggests that young women do not become homeless due to pregnancy but often leave home because of their relationships with older men.

The issue of women's homelessness being linked to their relationships with men is not new. Traditionally, men have usually held the economic power in a relationship and women's pathways into homelessness are often marked by their dependence on others to provide housing, coupled with residential instability and abusive relationships, even when there are no children involved (Jones, 1999). This view is supported by Somerville (1998) who suggests that women and young people are at greater risk of homelessness and social exclusion generally due to limitations of opportunity within, as well as access to, the labour market. Research in America by Culhane, Lee and Wachter (1996) also identified that rates of shelter admission were strongly related (inter alia) to an area's rates of female-headed households, especially those with preschool children. Research by Anderson and Rayens (2004) highlights that a lack of support, a lack of intimacy together with high levels of conflict in a woman's life seem to increase the risk of homelessness for women and other studies reinforce how the complexities of women's intimate relationships can be key determinants of their housing situation or homelessness (Wesely and Wright, 2005; Tessler et al 2001). This idea that women's homelessness is not a homogeneous issue that can elicit a standardised response is also recognised by May et al (2007). In summary, it is reasonable to suggest that official figures fail to provide an accurate picture of women's homelessness and tend to underestimate the prevalence of female homelessness, particularly amongst women without children.

Young people do appear to be disproportionately represented in the homeless population (Lemos and Goodby, 1999; Anderson, Kemp and Quilgars, 1993). This may indeed be partly due to limited opportunities available to them in the labour market as suggested by Somerville (1998). They are however also subject to restrictions in the housing market, often excluded from social housing either directly or indirectly due to assessments of priority or allocation policies, and from private sector housing due to cost or the perception by landlords that their lifestyle or age may cause difficulties with rent or neighbours. There has also been a cultural shift in the last two or three decades away from young people living at home until they got married, towards young people moving out of the family home in search of independence at a younger age (Rosenthal et al, 2006; Hyde, 2005). Young single people may not be able to find work due to lack of qualifications, experience and benefit payments for living expenses and housing costs being restricted for the under 25's. Lack of qualifications has been acknowledged as a risk factor in relation to homelessness (Randall and Brown, 1999) and Central Government have been making attempts to try to address the issues with initiatives such as 'Safe Moves' which include informal skills training as well as peer mentoring and mediation (Department for Communities and Local Government, 2007e & f). This lack of qualifications does not necessarily point to intelligence levels but rather the opportunity to attend school and have a stable education. This is of course linked to the ideas of relationship breakdown highlighted above. If a young person runs away from home they are likely to abandon their schooling as well. Young people diagnosed with depression or psychological disorders also appear to be at greater risk, with research pointing to a causal relationship with homelessness (Martijn and Sharpe, 2006; Bond et al, 2008). Further, if a family does not have stable housing and is forced to move from place to place when tenancies come to an end, this can not only disrupt schooling but also lead to a lack of continuity of education, resulting in poor education attainment for the young person. With diminishing social housing stock due to right to buy legislation and stock transfer initiatives, the lack of secure accommodation increasingly affects those families in poverty who are unable to buy their own homes, so again, there appears to be significant interplay between these social issues. Research suggests that young homeless people often come from a poorer background (Smith, J et al, 1998; Bruegal and Smith 1999) and therefore may not have family to turn to if things get difficult financially (Bond et al, 2008). Young people in search of independence or a better quality of life can often therefore find themselves in a situation of poverty without the life and budgeting skills to manage challenging situations and sometimes this can lead to homelessness. As for younger children, there is certainly little dissent that extreme poverty and abuse are the main causes of child homelessness, both in this country and around the world in developed and developing countries alike (Speak, 2004; Lajoie, 1998; Lusk, 1992). Childhood maltreatment is also noted as a common factor in homeless youth in the Netherlands (Gwadz et al, 2007).

2.8 Drug abuse

The causal direction of the relationship between drug abuse and homelessness is also difficult to clearly ascertain. As with some of the other issues here, the truth is probably that for some people drug use leads to homelessness and for others, the converse. There is clear evidence that drug abuse is high amongst the homeless population, particularly the street homeless population (Reid and Klee, 1998; Flemen, 1997; Klee and Reid, 1998). A study by Randall and Brown (1999) highlighted that between a third and a half of people sleeping rough had alcohol or drug problems and a study by the Big Issue showed that 70% of their vendors used drugs not prescribed to them (The Big Issue in the North Trust, 1998). Further, research looking at the population of people in bed and breakfast accommodation, supports the view that homelessness can arise from drug addiction, alcohol abuse, poor mental health, leaving the care system or prison or experiencing the challenges of being a refugee. Research highlights that people from all these groups were over-represented in the population studied (Carter, 1997).

Research does point to drug and alcohol difficulties as being a cause of homelessness with the abuse of drugs or alcohol leading to socially unacceptable behaviour which then causes a loss of accommodation – either through eviction or detention or through family and friends no longer being able or willing to tolerate the behaviour and forcing the individual to move on (Lemos and Goodby, 1999; Orwin et al, 2005; Early, 2005; Munoz et al, 2005; Odell, 2000). The drug or alcohol difficulties do however often appear to stem from a personal crisis such as bereavement or abuse (Lemos and Goodby, 1999) so it must be considered whether it is appropriate to focus on what could be viewed as a consequence and not a root cause.

Government guidance acknowledges that tackling substance misuse can help prevent homelessness (DTLR, 2002b) and therefore must consider that drug abuse can cause homelessness. Again, this issue is not limited to the United Kingdom. Drug abuse was found to be a major cause of homelessness in America (Breakey, Fischer, Kramer et al, 1989).

2.9 De-institutionalisation

Research by Burt and Cohen (1989) and Shlay and Rossi (1992) found that three quarters of the homeless people they sampled had been institutionalised; and research by Bines (1994) confirms a high proportion of single homeless people who had been in a psychiatric hospital had also spent time in other institutions, particularly prison or remand centres. Research by Riley et al (2007) highlights a strong association between recent incarceration and homelessness and this is echoed by Caton et al (2005) which cites an arrest history as increasing the risk of homelessness. There is a common understanding amongst front line workers that homeless people are often perceived as mad, bad or sad and need to conform or change in some way before they can be accepted once again under society's protective wing. This idea is probably rooted in the idea that many homeless people have spent time in an institution of some description. However, the need for change should arguably be directed at the institutions rather than the individuals if homelessness is seen as a direct result of being accommodated in such places. Long stays in care, prison, mental health institutions and the armed forces can all lead to a situation of institutionalisation, and long periods of rough sleeping can have the same effect. It is well documented that rough sleepers often find it very difficult to move away from the individuals and support networks they have established whilst sleeping rough (Alexander and Ruggieri, 1998; Klee and Reid, 1998). The concepts of co-dependency, familiarity and lack of social responsibility are recognised barriers to reintegration back into mainstream society (Dane, 1998; Thames Reach, 1998). These themes are perhaps more commonly associated with long stays in recognised social institutions but nonetheless arguably apply equally to the 'institution' of rough sleeping.

2.9.1 Leaving Social Services care

In the Audit and Assessment of Leaving Care Services in London, the National Children's Bureau highlights the high incidence of homelessness amongst young care leavers (Vernon, 2000) and suggests that rather than institutionalisation in itself being the problem, the difficulties may lie in the lack of resources available to assist young people leaving care, both in terms of being able to equip them with the necessary basic living skills and after care support. Young people are often discharged without the necessary skills to live independently, into accommodation which is often poor quality and they can feel abandoned with no-one to turn to when things go wrong (Vernon, 2000). Without support systems to sort things out when problems arise homelessness would be a likely outcome. Indeed, some research suggests that between one quarter and one half of homeless young people have a background of social work care (Caskie, 1992, Randall and Brown, 1999). The issue of a care background often being a precursor to homelessness has also been recognised by researchers (Banister et al, 1993; Van der Ploeg & Scholte, 1997; Biehal et al 1995; Hutson & Liddiard, 1994) and Central Government alike (DTLR, 2002a). Albeit not specifically referring to a care background, Craig and Hodson add support to the view that childhood adversity (as measured by the Childhood Experience of Care and Abuse, Bifulco et al, 1994) will increase the likelihood of homelessness in early adulthood, although the relationship of such experience and its link with homelessness is interwoven with the experience of early mental health problems and low educational attainment (Craig and Hodson, 1994). In research into begging in Scotland by Kennedy and Fitzpatrick, 94% of their sample had some history of rough sleeping and almost half of their sample had previously been in Local Authority care (Kennedy and Fitzpatrick, 2001).

2.9.2 Leaving prison

A third of people leaving prison leave with nowhere to go (Revolving Doors Agency, 2002). This is partly due to the fact that people serving sentences of less than 12 months do not have the support of a probation officer and cannot therefore access emergency accommodation ring-fenced for ex-prisoners and managed by the probation service. Also, 40% of those entering prison with a tenancy lose it (SEU, 2002). This is partly because of the housing benefit rule that stops housing benefit if someone is expected to spend longer than 13 weeks in prison. Homelessness as a result of deinstitutionalisation is therefore partly due to the administrative systems that exist within the housing benefit and probation systems and not completely due to the belief that coping abilities are reduced for people who have been in an institution for a significant period. The view that homelessness can rise from imprisonment is supported by Carlisle (1996) in research that looked at the needs of ex-prisoners. Research by Randall and Brown also supports the view that homelessness can often follow a stay in prison, suggesting that around half of people sleeping rough have been in prison, a young offenders institution or have had repeated contact with the police and the courts (Randall and Brown, 1999).

The issue of homelessness being associated with crime and leaving prison perpetuates the negative perception of homeless people as criminals. Whilst there is some evidence to support this link; (Crisis states that 85% of people sleeping rough have committed offences while on the street (Lemos & Goodby, 1999)), research by Carlen (1996) suggests that crimes by homeless people are punished out of proportion of their wrongdoing and jail sentences are often imposed albeit for short periods, where they would be unlikely to be imposed if the defendant were housed. The perception of homeless people being criminals stems in part from the early vagrancy laws. Every country in Europe has passed laws against vagrancy and in Belgium and France people were still being imprisoned in the 1990s just because they had no home. In England, prison sentences have been replaced by fines but vagrancy is still a criminal offence (Steering Committee on Social Policy, 1993). It is also suggested that the criminal justice system may actually be contributing to the levels of homelessness due to the difficulties faced on discharge by those who have served short sentences, as discussed above. Indeed, Carlen's research also highlights that homeless people are regularly the victims of unpunished crimes and suggests that the criminal justice system does not pursue such matters with equal vigour. Crisis suggests that almost four out of five people sleeping rough have been the victims of crime (Lemos & Goodby, 1999). The idea that people at the sharp end of the continuum of housing need can experience disproportionate crime levels is supported by further research for Crisis by Newburn and Rock (2005) which highlights that levels of crimes against homeless people are far, far higher than the general population. This is not limited to rough sleepers. Research by Murie shows that households in council tenure with the highest levels of poverty, were five times more likely to be victims of crime (burglary) than households of other tenure (Murie, 1997).

2.9.3 Leaving mental health care

The conservative government policy of closing large psychiatric hospitals in the late 1980s and early 1990s was perceived to be responsible for the visible increase in homelessness (Bhugra, 1996). The explanation for the increase in homelessness over this time is probably much more complex and is arguably equally attributable to other social, economic, and political changes taking place in the United Kingdom at that time. Indeed, there is dissent on the view that closure of psychiatric institutions is a primary cause of homelessness, suggesting instead that the cause lies with housing shortages, unemployment and under-spending on health and community services (Abdul-Hamid, 1999) and this has already been detailed above (see **2.3**). There does however appear to be support for the view that there is a strong correlation between time spent as an in-patient in a psychiatric hospital and becoming homeless (see above). What isn't clear is whether this might be due to having spent time in the institution or due to underlying mental health difficulties that led to the admission in the first place. A study in Scotland does provide some limited evidence of homelessness being a direct result of insufficient or failed discharge care plan arrangements (Crockett and Spicker, 1994) but again, this does not necessarily indicate issues of institutionalisation, rather just a need for greater support on discharge. Dean and Craig (1999) suggest that the high levels of homeless people with mental health problems are a result of lack of housing awareness and expertise within the community mental health teams rather than institutionalisation issues. Gill et al (1996) go further and suggest that it is not institutionalisation that leads to homelessness but social isolation due to mental disorders, either self imposed or generated by general society, that causes high numbers of people with mental ill health within the homeless community. There is, nevertheless, some limited support that institutionalisation is a direct cause of homelessness and that appropriate through-care processes could contribute to the prevention of homelessness (Munn, 1996).

2.9.4 Leaving the armed forces

The percentage of homeless people that have served in the armed forces is also high – thought to be between 20% and 30% - and research shows that this group are more likely to sleep rough and are more likely to have been homeless for a long time (Gunner and Knott, 1997; Randall and Brown, 1994). This overrepresentation of ex-service personnel in the homeless population is a pattern that is repeated in America (Time South Pacific, 2007). Whether this is as a result of institutionalisation is hard to say as research indicates that many of ex-service personnel (more than 30%) report relationship problems as the reason for their homelessness and 20% reported accommodation related reasons. There was also a high incidence (12-15%) of drink problems demonstrated amongst this sub group. Whilst there is some evidence to support the fact that ex-service personnel may cope with street homelessness better than people who have not been in the armed forces possibly due to their survival training, this does not make the situation any more acceptable. Indeed, this may contribute to a marked unwillingness of this sub-group to ask for support together with a tendency to be more comfortable with a less settled lifestyle (Randall and Brown, 1994). In addition, Randall and Brown's research shows that a large percentage (41%) of this sub-group have also been in prison and 23% had been treated in psychiatric units. Whilst this may support the argument of deinstitutionalisation as being a cause of homelessness, it might again be that it is the individuals' challenges and difficulties that have led them to institutions in the first place and it is these challenges and difficulties that are resurfacing once the institutional support is withdrawn that cause or sustain homelessness. The link between homelessness and deinstitutionalisation is recognised by the Audit Commission in their checklist for preventing homelessness which encourages the availability of housing advice to prisoners and those leaving custody (Audit Commission, 2003).

2.10 Migration

There is a belief amongst some Local Authorities that if they provide adequate or decent services for homeless people, such services or provision will attract homeless people from outside their Local Authority area and there will be a resultant drain on already stretched resources, with local people suffering as a result. This "magnet" effect is highlighted by May (2003) who specifically mentions Bristol, Manchester and Brighton and Hove as areas that are perceived as being comparatively rich in resources for homeless people after having received substantial funding under the Rough Sleepers Initiative. The idea of this magnet effect is not a new one (Whynes, 1991) and the idea of homeless people being transient or mobile goes back to the 16th Century (Hopper, 1991) with the phrase "men of the road" still being used today. However, this traditional view of mobility has to some extent been replaced by a younger homeless population living on the fringes of the New Age Traveller movement apparently moving between places that are believed to have a high level of services, together with opportunities for street earning and access to a ready supply of drugs (May 2003). There is however, some evidence to support a contrary position regarding the mobility of homeless people with a drug dependency. Tompkins et al (2003) found that there was significantly less mobility away from their place of birth amongst this sub-group of homeless people and hypothesised that this might be due to a necessity to be near known suppliers for their drug needs. Further, there is other research that suggests that most homeless people stay close to their area of origin and that they, in fact, display a narrow scope of geographical migration (Lindquist et al, 1999). This idea of staying close to home is also recognised by Lemos (1999) who evidences the issue of homeless people feeling the need to be near to family. Lemos points to the fact that people sometimes have the opportunity to resolve their housing difficulties by moving away but choose instead to remain homeless because they feel unable to move away from their place of origin or the support of their family. This can be a particular issue in rural areas where housing opportunities may be more restricted (Cloke et al, 2003). Research in Belgium provides further evidence of this trend for homeless people to stay close to friends and familiar social networks such as employment opportunities and housing markets during episodes of housing need (Meert & Bougeois, 2005). Indeed, there is some evidence to support the view that migration of homeless people away from their place of origin may actually be a step towards trying to find love and support not accommodation (Richardson & Corbishley, 1999).

The fact that homeless people sometimes feel that they have to move, in order to work towards resolving their difficulties, is well documented (Bramley, 1993; Novas Ouvertures Group, 1998, Bhugra, 1996; Egan, 1994, Cloke et al, 2003). A person escaping violence for example may feel the need to move far away from the perpetrator in order to feel safe. In such circumstances, the resulting homelessness may arguably be seen as a symptom of other difficulties. Further, the necessity for movement from rural areas to urban centres to access services and opportunities is an established and accepted phenomena (Ford et al, 1997; Cloke et al, 2000a). In the late 70s and 1980s there was clear evidence that unemployment caused a job-seekers migration from depressed areas in the North of the Country to London and the South (Foord, Palmer and Simpson, 1998). It is also recognised that some people migrate to more urban areas to escape stigma or for a sense of anonymity in dealing with their homelessness (Cloke et al 2000b). Importantly however, it seems that whether a location offers hostel accommodation exerts very little influence on the mobility of homeless men (May, 2003). That said, there does however appear to be some evidence that Central London, the South coast and regional capitals tend to have a higher inward migration of homeless people than other areas of the Country (ODPM, 2000)

The issue of general migration to particular areas affects the local house prices as well as the availability and price of accommodation to rent. Areas that are viewed as attractive places to live such as Cornwall, or coastal localities along the South coast in particular have attracted homeowners from outside the areas, reducing supply, pushing accommodation prices up and arguably having a knock on effect on the levels of homeless in the areas concerned (Kennedy, 1993). This is an issue that is recognised across Europe. Fitzpatrick draws on the definition of homelessness employed by FEANTSA and highlights that homelessness in the European Union is normally attributed to the changing nature of housing markets, poverty and unemployment, the increasing individualisation of society, migration, and the deinstitutionalisation of psychiatric institutions. However, this is tempered by an acknowledgement that varying emphasis is placed on structural and individual factors in explaining homelessness in different member states (Fitzpatrick, 1998).

The issue of migration in relation to homelessness is further complicated by migration into the country of refugees and asylum seekers. Although NASS purportedly deals with their immediate homelessness, once granted leave to remain, they will often need to rely on government assistance under the homeless legislation to meet their housing needs and some Local Authorities will therefore have an additional call on their resources.

With freedom of movement around the country and across Europe it is therefore inevitable that some Local Authorities will have to respond to the housing needs of people who are not local to their area. Sometimes this may place an increased burden on the homelessness resources for the area; however, the homelessness legislation recognises this issue by only requiring Local Authorities to help with the long term housing needs of those with a local connection to their area. Once it is acknowledged that the applicant satisfies the criteria to be rehoused under the homeless legislation, the Local Authority does not have to rehouse the 'foreign' applicant but can instead refer the duty to rehouse to a Local Authority with whom the applicant does have a local connection. Further, the argument that some areas may be particularly attractive to 'outsiders' would apply equally to non-homeless people as it does to homeless people. Some areas around the country will undoubtedly experience higher numbers of homeless people than other areas but there will also be different levels of visibility, with homelessness being much less visible in rural areas than in urban centres (Cloke, Milbourne and Widdowfield, 1999). This may be due to the fact that the area is an urban centre or because the area is perceived to be an attractive location but whatever the reason it is likely to apply to both the homeless and non-homeless population. Areas that offer a wide range of services and facilities will also arguably attract households who are not homeless. Whilst homeless people migrating to an area may be perceived as an additional drain on local resources, people who are not homeless who also migrate to more urban or coastal areas for work and leisure purposes or as a lifestyle choice could be perceived as injecting money into the local economy via local taxes and the use of local services. If demand for local housing consequently increases as a result of the inward migration and supply is limited, it will push up house prices and the cost of renting accommodation which could then have an impact on the levels of homelessness within the area. Indeed, in the government's report 'More than a roof', it is acknowledged that, by and large, levels of homelessness tend to be greatest in areas of high housing demand, where supply constraints are greatest (DTLR, 2002). Arguably then, house prices and rental figures could be more helpful indicators of the likely demand for homelessness services rather than the 'magnet' debate detailed above. In conclusion then, while the literature on the causes of homelessness does not point to migration as being a key issue, migration does appear to be an influential factor that needs considering in working towards a model for determining levels of homelessness.

2.11 Conclusion

It would certainly seem that there is a wealth of evidence to support links between the issues highlighted and homelessness. In particular, there is evidence of correlations between areas other than housing, where the focus has historically been held. It would also appear that there is support for the idea that the issues discussed above often precede homelessness, although they of course, could also present during homelessness. Issues such as ethnicity, poverty, poor health, institutionalisation and sex have all been demonstrated to put individuals at greater risk of homelessness than people for whom these factors are not an issue. There also appears to be evidence that a combination of these factors is often the trigger for homelessness. In research by Randall and Brown (1999), 36% of their sample gave an indication of having multiple problems, particularly the combination of mental health and drug and alcohol problems. The idea that the risk of homelessness increases as the number of associated issues present increase appears to be acknowledged and accepted by Central Government (RSU, 2001) as well as voluntary sector agencies working in the field (Shelter, 2005; Citizen's Advice Bureaux, 2004; Randall and Brown, 1999) The idea that considering a combination of issues which appear highly correlated with homelessness and are clear precedents could help to identify and thereby reduce incidents of homelessness is not a contested theory. This allows for the possibility that information on the extent that these issues exist within a Local Authority area at a particular point in time, could potentially contribute to predicting future levels of homelessness within that area at a later point in time. If appropriate indicators for these issues were available, a predictive model could potentially be constructed. The issue of what indicators are available and appropriate is discussed in chapter 4.

Chapter 3: How Local Authorities currently try to estimate future need for Homelessness services

3.0 Introduction

This chapter looks at how Local Authorities currently try to gauge likely future demand on their homelessness services. It looks at some of the problems the councils face, the methods employed and the available evidence to support the use of those methods. In order to further clarify how Local Authorities currently estimate future demand levels for homelessness services a short self completion questionnaire was sent by email to 349 Local Authorities in England asking them to state what methods they used, how regularly those methods were used and how adequate they considered the methods to be. More details of this method can be found at 4.1 and the questionnaire together with associated correspondence can be seen in Appendix one. The questionnaire also asked Local Housing Authorities to comment on the level of key influences on resource allocation within their department. This chapter provides details of the results of this survey and discusses the availability and adequacy of the methods currently being used to forecast future need. In addition to the questionnaire, the homeless reviews and strategies for all Local Authority areas in England were also considered in order to mitigate the risk of response bias and to avoid missing any working practices that were not highlighted by the responses to the questionnaire. The survey results and the additional information obtained from the reviews and strategies are discussed in relation to relevant literature. The chapter suggests that because homelessness is such a nebulous, often intangible concept to define and manage, Local Authorities have a propensity to avoid the challenges of getting to grips with the reality of homelessness by considering the wider perspective, instead choosing to rely on a much more simplistic but familiar framework of the statistical reports they have to make to Central Government to inform their decisions about future planning requirements. It concludes that the existing methods being used are highly subjective and variable and that there does not appear to be any standard, objective, reliable and valid method for predicting levels of homelessness being used by all Local Authorities across the Country.

3.1 Responding to homelessness

3.1.1 Who is responsible

The day-to-day interpretation and implementation of the homelessness legislation throughout England is the responsibility of Local Government in over 350 areas of the country. Local Authorities are funded by a combination of local taxation, charging for some of their services and Central Government funding with some Council areas receiving additional funds from Europe for specific projects. Whilst Councils are accountable to Central Government and ultimately to the electorate, the day-to-day decisions about homelessness are made by staff who have varying levels of skill and limited resources at their disposal.

3.1.2 Variation in practice

Although the statutory definition of homelessness and required responses does provide a reasonable starting position and some level of clarity for Local Authorities, this is contentious in itself. Varying interpretation of the legislation and reporting differences are wide spread amongst Local Authorities (Evans and Duncan, 1988; Hoggart, 1995) and there is a plethora of case law available on the various aspects and definitions that lead to varying levels of assistance being provided by Local Housing Authorities as defined by the homeless legislation. As previously detailed, homeless applications and acceptances for each Local Authority are recorded and monitored by Central Government in the form of P1E returns. The proportion of acceptances across the Country can vary between about 20% and 60% of applications. Some authorities, who have plenty of social housing stock or hard to let property available, have the opportunity to take a more inclusive approach with their interpretation whilst other Councils in areas where housing is in short supply may feel they need to be more restrictive. Such wide variation suggests that whether or not a household is accepted as homeless is as dependent on where they apply, as on their housing circumstances (Widdowfield, 1999). This issue is recognised by the House of Commons who suspect that acceptances may indeed be used as a gatekeeping method to keep numbers down in some parts of the country (House of Commons, Committee of Public Accounts, 2005) The sceptical view is that rather than provide an accurate picture of homelessness, official figures record "the willingness of councils to investigate and respond to housing insufficiency, in a highly subjective decision environment" (Hoggart, 1995). This highly subjective decision environment is demonstrated in evidence provided to the House of Commons by the Citizen's Advice Bureaux (who dealt with approximately 85,000 cases of threatened or actual homelessness in 2002-3) which highlights that some councils actually direct homeless applicants to make an application to go on to the housing register rather than accept a homeless application from them in order to avoid responsibilities under the homelessness legislation (CAB, 2004). As an example, Daventry District Council openly acknowledge that they actively discourage people from making a homeless application if it seems on the face of things that the Council would not have a full duty to rehouse the applicant (Daventry District Council, 2004). Homelessness charities have challenged the suggestion of Central Government that homelessness is falling, suggesting instead that homeless people are being turned away from housing departments (Stothart, 2005). Such practices result in under-representation of the size of the homeless problem and do nothing to contribute to a clearer understanding of the size and nature of the wider homeless problem in a particular area.

3.1.3 Increasing demands

Recent changes to legislation and policy have widened the scope of the definition of homelessness and this could potentially lead to an even greater disparity in interpretation of legal terms and housing circumstances between authorities. Central Government guidance has encouraged Local Authorities to adopt a more inclusive approach to dealing with homelessness beyond the priority need groups identified by the legislation (ODPM, 2005b & d). However, there is some evidence to suggest that as housing supply has been reduced and legislation has widened the net in respect of who is entitled to assistance, Local Authorities have interpreted the legislation in an increasingly narrower fashion (Anderson & Morgan, 1997; Valios, 2005) in an attempt to make limited resources stretch across the statutory obligations. Finances and staff are finite and essentially this means that homeless people have to compete for services with other high need groups. Ultimately this can lead to an inability of services to respond to identified need (Crane and Warnes, 2001). This can often be due in part to the limited knowledge and ability of homelessness staff to properly apply the law and make the right decision on a homeless application. Staff are not always adequately trained or experienced enough to apply the law correctly and this in itself can generate additional pressures on resources from consequential applications for reviews of decisions which could have been avoided if the law had been applied correctly from the outset (CAB, 2004). This concern about staff shortages and under-skilling is widely recognised, particularly by the voluntary sector (St Mungo's, 2004). Homelessness staff within the Local Authorities inevitably concentrate limited resources on the mandatory requirements of the legislation. This leaves little or no resources free for further training of staff or for the exercising of their discretionary powers. Indeed, there is often insufficient availability of resources to meet the mandatory requirements and this can lead to very restrictive decisions being made. This is a problem that is also recognised in the United States, with many cities turning away people seeking assistance (American City & County, 2008). In England, the Housing Law Practitioners Association, (HLPA), believes that decision makers have been forced into a culture of adverse decision-making as a consequence of the pressure created by the lack of housing resources. They believe that adverse decisions are not made because the applicants in question are undeserving but because the authority does not believe it can cope with the numbers of homeless people (HLPA, 2004). This reluctance to engage with homelessness was evidenced by particularly draconian practices in Westminster Council where access to health care and benefits for rough sleepers was withdrawn and in Stoke-on-Trent where 24 hour music was piped into an area of the town to deter rough sleepers from congregating (Jerrom, 2003). As stated by Arden and Hunter, being "harder" in decision making can in fact be an escape route from a statutory duty (Arden and Hunter, 2004). This concern is echoed by Shelter, who highlight that the number of applicants found to be intentionally homeless, and therefore owed no long term duty to rehouse by the Local Authority, more than doubled from 1997/8 to 2003/4 (Shelter, 2004b). Further, the percentage of decisions concluding that an applicant is intentionally homeless has consistently risen between 2001 and 2007, from 2% to 7% (Department for Communities and Local Government, 2008). Concerns about the increase in intentionality decisions are also held by Homeless Link (2004). It is even acknowledged by Central Government that the tests for vulnerability and intentional homelessness do not appear to be being fairly or consistently applied by all Local Authorities (House of Commons, Committee of Public Accounts, 2005). Indeed, a Select Committee found it extraordinary that some councils accept half of all applications while others grant as few as 9% (Kenny, 2005). The literature also points to a disparity in response in rural areas and highlights that local relations between government and advocacy workers can have a significant affect on the response (Cloke et al, 2007). The situation is further exacerbated by the 2002 changes in the legislation which directs Local Authorities to also take into consideration those to whom they have the power to assist, for example those not in priority need but not intentionally homeless (section 5 of the 2002 Act). In any case, there is an underlying duty of every housing authority to ensure that advice and information on homelessness is available free of charge to anyone in their district (section 179 of the Housing Act 1996). It is recognised that including in the definition of who is entitled to assistance, anyone who potentially might become homeless, or who might need advice about homelessness, is a wide net to cast. However, if Local Authorities are to be successful with the prevention of, and positive action on, homelessness, it will be necessary for them to adopt such a broad perspective on the issue and such an approach is actively encouraged by

Central Government (ODPM 2002a) as well as national organisations working in the field of homelessness (Crisis, 2002; Shelter, 2004b).

3.1.4 Lack of support

Whilst there is now a legal requirement on Local Authorities to consider levels and likely future levels of homelessness in their district, guidance is both unspecific and unscientific about how these matters should be considered and how the information should be interpreted to assist in determining future levels of homelessness and therefore future resource requirements and allocation.

3.2 How Local Authorities currently try to estimate future demand

How Local Authorities currently try to estimate future demand is not well documented. Although the legislation now requires Local Authorities to address future levels of homelessness within their area, only a little over half of authorities had explored this in their strategies with only a third tackling the issue fully (ODPM, 2004d). Whilst Authorities acknowledged that the DTLR handbook (Homelessness Strategies: a good practice handbook, 2002) contained many useful ideas on identifying the scale of current and future needs, Authorities said that often the information was not available in practice (ODPM, 2004d). It was therefore important to try to find out more about current methods used by local authorities in order to establish whether a prediction model might be utilised and helpful. The following sections discuss the results of the questionnaire sent to local authorities to investigate this issue. Each method used by local authorities is considered below: Firstly in terms of how extensively it is used and how effective it is perceived to be by local authorities and secondly, in terms the general reliability of method and any evidence in the literature to support or reject its use. The main findings suggest that future planning decisions in relation to homelessness are generally based on past levels of service delivery, subjective consultation processes and assumptions about the relationship between homelessness and the housing market. In the main, the methods used are devoid of theoretical underpinning and appear to be inadequate for reliable forecasting of future need.

3.3 Survey responses

168 Local Authorities returned a completed questionnaire. This represented a response rate of approximately 48%. As part of the analysis, Local Authorities were grouped into council type according to their designation, namely; city (large towns strictly speaking with a cathedral), district (a part of a county often incorporating urban and rural areas), borough (towns or areas represented in the House of Commons), unitary (areas who have amalgamated their administration with the next tier up of Local Government), London (inner and outer) (discrete administrative areas within the capital city) and metropolitan boroughs (major cities). The level of response by council type is shown in **Figure 1**. London and unitary authorities had the lowest response rates to the questionnaire with approximately 25% and 28% respectively. There was no significant difference in response rate between inner and outer London authorities. The response rates for the remaining groups of authorities ranged between approximately 47% and 53%. An additional follow up email was sent to London and unitary authorities to try to improve response but failed to generate a significant improvement. The overview of the reviews and strategies failed to highlight any additional or innovative methods for quantification or prediction beyond those reported in the responses to the questionnaire.

All Local Authorities who responded to the questionnaire used a combination of methods to estimate future demand for homelessness services in their Local Authority area. The awareness and frequency of use of the various methods employed is shown in **Figure 2**. The use of methods was crosstabulated with their perceived adequacy and the frequencies are shown in **Figure 3**.

3.3.1 Use of P1E returns

3.3.1.1 Survey results

All of the authorities who responded to the survey used past experience and P1E returns either regularly or occasionally as an indicator of future need. This method stood out as the one regularly used more than any other. The vast majority (94%) of Local Authorities responding said that they regularly use this method with the remaining authorities (6%) using this method occasionally. Whilst this is not in any way surprising, what is more interesting is the perception of Local Authorities of the adequacy of this method. Of those authorities that used this method regularly only 24% felt that it was perfectly adequate. 71% felt it was reasonably adequate and 4% felt it was inadequate.

3.3.1.2 Discussion

Looking at the reviews and strategies of the Local Authorities, together with the questionnaire results, it would appear that analysis of P1E returns is the predominant tool used for estimating future demand for homeless services. Authorities generally seem to undertake varying levels of analysis of the profile of applicants that are accepted as being owed a duty under the homelessness provisions as well as the reasons behind their homelessness. Trends are identified and these trends are generally projected a year or two into the future. These figures are then used as the predominant informants to policy and strategic responses to homelessness and as key indicators for how resources should be allocated. The major problem with such an approach is that these figures exclude whole sectors of the homeless population. Namely, households who do not approach the council for assistance, those considered ineligible for assistance or not homeless and those considered not to be in a priority need group. The Office of the Deputy Prime Minister, (ODPM), recognises that an analysis of P1E figures to develop understanding of the local homeless situation is a limited approach which could exclude many sectors of the homeless population. Indeed, approximately 20% of authorities missed out whole groups of homeless people from their analysis in their reviews and strategies, with black and ethnic minority groups, single homeless people, rough sleepers, ex-service personnel, former asylum seekers and refugees and gypsies and travellers being the most common groups omitted (ODPM, 2004d). Additionally, the P1E figures count numbers of applications, not household size; so one application could for example, potentially refer to a family of six homeless people. There is also evidence of Local Authorities aggregating data which essentially hides some of the reasons for homelessness. This makes comparison across authorities difficult and can prevent relevant issues from being seen and explored (ODPM, 2004d). The figures therefore fall far short of providing a comprehensive picture of homelessness within a particular area and, at best, can only give some idea of past levels of statutory homelessness. Lack of awareness of legal rights, negative media stereotyping or a reluctance to undergo the humiliation often associated with making a homeless enquiry, may deter many people from presenting or even seeing themselves as homeless (Widdowfield, 1999). Additionally, in the late 1990's, Government policy changed, and councils no longer had to report on the numbers of homeless applications they received, just the assessments and decisions that they made. Given that there is evidence to suggest that a significant proportion of applicants drop out of the process before a decision is reached (O'Callaghan, Dominian, et al, 1996) official figures will inevitably be under-reporting the size of the problem. Consequently any resource requirement justified using these figures will only ever be enough to respond to the proportion of individuals who manage to access and navigate the system successfully.

Research indicates that homelessness is commonly a result of de-institutionalisation, poor mental health and poverty (Daly, 1996; Jencks, 1994; Randall & Brown, 1994 & 1999; Dean & Craig, 1999; Anderson, Kemp & Quilgars 1993; Craig & Hodson, 1998; Anderson & Christian 2003). These categories seem however to constitute only a very small percentage of acceptances as shown by the P1E returns. Furthermore, the Local Authority reviews of need and service provision across the country consistently refer to the need for increased resources to be made available for vulnerable single homeless people with multiple needs. This is often evidenced by results from consultation with other local agencies but not reflected in the P1E figures. One possible explanation could be that budgetary restrictions inevitably lead to Councils having to prioritise resources towards clear cases of where the full duty to assist is inescapable. If there is, in any way, a culture of accepting a duty to assist only where reason to exclude cannot be evidenced, the figures are inevitably going to reflect this by showing high numbers of homelessness where it is arguably far harder to dispute or to apportion blame (e.g. family breakdown or formal notice to end tenancy) with less homelessness acceptances being due to vulnerability, for example, which can be more open to subjective judgements. Additionally, there is some limited evidence that suggests that some councils may be discouraging homeless applications either under the guise of preventing homelessness or in an attempt to reduce their figures for use of bed and breakfast accommodation (Hawkey, 2004), an expectation of Central Government policy. This lack of comprehensive coverage in the figures is further compounded by the fact that many homeless people assume that they will not receive assistance from the Local Authority and consequently self exclude themselves from the service provided, not even making an initial approach to the Local Authority (Widdowfield, 1999). Some small scale local research projects support this theory. A survey undertaken in Bournemouth in 94/95 estimated that twelve times as many non-priority single homeless people approached voluntary organisations as they did Local Authorities. Further, a homelessness survey in Ashfield in 95, 96 and 97 highlighted that only 15% of people who approached agencies during the survey had approached the Council for assistance (Evans, Zimmick, Hutson & Smith, 2001). A focus on use of analysis of past P1E returns to estimate future levels of homelessness is therefore of some concern given the flaws in this data, as detailed above, and the acknowledgement that official statistics do not give an indication of the extent of non-statutory homelessness (Anderson, Kemp & Quilgars, 1993). Given that the recent legislation has expanded the remit of Local Authorities in an attempt to try and deal with the homeless problem, previous P1E figures cannot be considered as an accurate guide to the likely levels of statutory homeless in the future.

3.3.2. Consultation

3.3.2.1 Survey results

Consultation with local agencies showed up as the method used most frequently after analysis of P1E returns, with just over 74% consulting regularly and a further 23% using the method occasionally. Again, when the perception of adequacy of this method is considered, the results mirror the use of P1E returns, with only 24% of regular users considering that this method is perfectly adequate and 71% considering it a reasonably adequate method of determining future need. Again, 5% of authorities considered this method as inadequate. The method of consultation, sometimes referred to as targeted census, has its own difficulties. It usually refers to aggregated estimates using data from various primary data sources such as different agencies working with homeless people in a particular area. (Jencks, 1994; Crisis, 2003; Shinn, Baumohl and Hopper 2001). To use the word 'census' is arguably misleading as it is not always possible for all agencies working with homeless people to be identified or included in the aggregation. Consultation with, and information from local agencies appears to form a key role within Local Authorities policy and practice around quantifying the homeless problem. Indeed it is actively encouraged by guidance (ODPM, 2002a & d; Evans, Zimmick, Hutson & Smith, 2001), however survey responses and an overview of authorities reviews and strategies seem to suggest that information from this source appears inconsistent in quality and quantity.

3.3.2.2 Discussion

Different agendas and monitoring systems as well as issues of confidentiality make data transfer difficult. Further, response rates from those agencies that are included are often poor, usually due to limited resources being available to dedicate to the task of providing the information. Services in this sector are often working with very limited resources and may be ill-equipped to participate in information gathering exercises (Harvey, 1999 p59). Individuals and agencies polled may also be uninterested in the process due to anticipating no improvement as a result of their participation. Even when responses are provided, the statistics are often far from reliable as there are often no safeguards against issues such as double counting either within the agencies or between the agencies contacted. If data isn't obtained from every agency involved with homelessness within a particular area it will not be a true census. The problem of the lack of active participation within such exercises is not however limited to agencies working in the voluntary sector. Indeed, a report for the Office of the Deputy Prime Minister (ODPM) evaluating the Local Authority reviews and strategies highlights that "...involvement of Social Services at a strategic level was disappointing... and other statutory agencies such as Health and Probation were also hard to engage" (ODPM, 2004d). Unless full participation of voluntary and statutory sector agencies can be achieved, statistics based on such methods of data collection will be incomplete and therefore of questionable value as a tool for estimating future need. There has been some work done on improving this methodology to reduce issues such as double counting (Shelley and Fitzgerald, 2000), but even when the methodological challenges are reduced, such a method can only estimate past numbers of homeless people. It does not provide reliable indicators for likely future numbers. The difficulties of data collection and estimating future need have been recognised as the main problems experienced by Local Authorities in the preparation of their homeless reviews and strategies (ODPM, 2004d).

This has led, inter alia, to the recommendation that common monitoring systems be introduced and encouraged across agencies and that further guidance be issued on collecting appropriate data for predicting future homelessness trends.

There are notable exceptions to the problems of multi-agency working, for example, Southampton, Exeter, Kennet, Bury and Tamworth where common monitoring systems reduce some of the methodological concerns such as double counting. Whilst some authorities have or are working towards common monitoring systems with other agencies in the Local Authority area, some Local Authorities appear slow to embrace this concept. For example, in 2003 Cheltenham's review highlighted that they were, for the first time, only then looking to consider figures held by their statutory and voluntary sector partners in their assessment of and response to the homeless problem in the district by introducing a common monitoring system (Cheltenham Borough Council, 2002). In the Government's review of the Homelessness Strategies, they found that only approximately one third of authorities proposed to develop a common monitoring system (ODPM, 2004d). Only approximately 10% of authorities who responded to the survey, said they already undertook joint monitoring with other agencies in their area, including voluntary sector agencies working with homeless people. This was more than simply consulting with other agencies and often included regular recording and monitoring of individual approaches of both statutory and non-statutory homeless people to the various agencies involved. One authority, working in partnership with local voluntary sector agencies, undertook a snapshot survey of all approaches for housing advice or support over a short period of time and asked all respondents whether they expected to become homeless within the next three, six or twelve months. They found data from this survey so informative that they now repeat the exercise on a yearly basis. Whilst such a response to quantifying future need is an admirable one, it is a costly approach in terms of the resources required to collect, process and use the information gathered. Further, whilst it may be workable in a smaller or more rural authority, it is simply not practical in larger authorities where approaches to statutory and voluntary agencies run into thousands. Additionally, data that relies on self reporting of anticipated behaviour or circumstances has been shown to not be particularly reliable (Shanks, 1981). Not only do peoples' situations change over time but there is always the possibility that respondents will report anticipated homelessness when that might not be the reality, with the hope or expectation that such a response will invoke positive action from the Local Authority.

In addition to consultation with other agencies, some Local Authorities have tried, to some extent, to engage with homeless people in an attempt to improve their ability to deal with homelessness in the future. However, these attempts to engage have essentially been limited to surveying existing service users or ex-service users that have been accepted as homeless or rehoused though the homelessness service. Further, the attempts are often limited to monitoring the quality of service of the homeless department (ODPM, 2004b) rather than assessing the size of the homeless problem. In any case, the response rates to such surveys have generally been low and, due to the lack of adequate sampling methods, such surveys are not likely to be representative or reliable. There is some evidence in the literature supporting respondent-driven sampling as an effective technique for the assessment of hidden populations such as homelessness (Heckathorn, 2002; Salganik and Heckathorn, 2004). Analysing biases within this sampling method can lead to redesign of the sampling process to reduce bias and produce reliable estimates (Heckathorn, 2002). Unfortunately, the efforts of Local Authorities to engage with homeless people to date stop short of being defined as respondent-driven sampling where samples can be expanded by using chain-referral or snowballing techniques. This appears to be a missed opportunity to attain valuable information about those individuals who have not been assisted by the Local Authority. The current consultation efforts can therefore add little contribution to quantifying or understanding future homelessness.

Clapham suggests that a housing pathway approach is one way to enable structural and personal factors to be considered together to promote a better understanding of homelessness (Clapham, 2003). This approach involves collecting a detailed history of the circumstances of individual homeless people. This can involve documenting their whole life history across all aspects of their lives, not just their housing histories. This history is sometimes plotted against a time line showing important social, economic or political change. The approach is helpful in increasing understanding of homelessness by flagging up issues that have led up to the incidence of homeless. However, by its very nature, such a humanistic approach provides few conclusions that can be generalised to the population of homeless people and offers no useful volume indicators for use in the strategic planning of services. Whilst detailed and often complex, the knowledge attained through the use of a pathways approach is more suited to providing a solution to the individual's difficulties and is difficult to translate into predictive values of likely numbers of homeless people.

Common sense and recommendations for general consultation with other statutory and non-statutory agencies have been used with varying degrees of accuracy and success (ODPM, 2003e). It is obviously useful for planning purposes to have advance information on issues that could affect levels of homelessness in an area, such as changes in the benefit system, new build plans of housing providers and impending factory closures, but co-operation with other individuals and organisations is often limited due to different agendas. It is recognised that partnership working around homelessness may be particularly helpful to Local Authorities in the short term, assisting in the identification of current trends and concerns; however, there is currently little evidence to suggest that it is a particularly useful tool for the medium to long term future planning of homelessness services. A Local Authority may have the flexibility within its resource allocation practices to react in the short term to local issues within a fiscal period but without "*hard, irrefutable evidence for their funding and effectiveness*" (Evans, Zimmick, Hutson & Smith, 2001) Local Authorities can struggle to justify longer term resource implications of initiatives or general service provision to Central Government and can consequently fail to attract sufficient funding for continued provision in the medium or long term. The recurring issue of the quality of data obtained from different agencies is undoubtedly a problem that needs addressing. Even when Local Authorities are willing and able to consult widely in the local community, information obtained is not always translated into usable figures (ODPM, 2004d). While such methods are often employed in the absence of more sophisticated or valid tools, such an approach will also lead to inconsistency amongst Local Authorities with authorities employing staff with differing levels of skill and experience. Staff may also experience varying degrees of political and economic pressure to adopt a particular approach in their decision making processes and this could affect the reliability and validity of figures produced.

One attempt to mitigate the methodological problems of gathering information from different sources is that of aggregated estimates. This is similar to targeted census but does not pretend to be a comprehensive or accurate assessment. What it does try to do is to fill in the gaps where there is no information available, often using weighting techniques (Stolzenberg, 2004). Aggregated estimates can provide a more comprehensive assessment of the current situation but are also fraught with the methodological problems of undercounting and double counting. Aggregated statistics are often collected in different ways and for different purposes and will therefore be scientifically imperfect though not necessarily without value (Kisor & Kendal-Wilson, 2002). At a macro level, FEANTSA (European Federation of National Organisations Working with the Homeless) used aggregated estimates to try to begin to fill gaps in information on levels of homelessness across Europe, taking steps to mitigate the common problems of undercounting and double counting. Aggregated estimates have also been used with some success by voluntary sector and statutory agencies working with homelessness in England (Kenway & Palmer, 2003; ODPM, 2004d), in France (Ardilly and Le Blanc, 2001) in America (Burt and Cohen, 1989), the Netherlands (Health Council of the Netherlands, 1995) and in Australia (Chamberlain, 1999) to name but a few. While such estimates may not stand up to rigorous scientific scrutiny, in the absence of anything else, they arguably provided a starting point for defining appropriate policy and the type of resources necessary to try to tackle the problem. Again where such estimates fall short is to offer any guidance or indications for estimating likely future levels of need. On a more philosophical level, the issue of the existence of homelessness agencies will also have an affect on the figures. When agencies are present in an area a more comprehensive assessment of the problem of homelessness may be possible, however the mere existence of those agencies may be lowering the number of homeless people who have to approach the Local Authority for help (Bogard, 2001). However, if agency funding runs out, closure can have a drastic affect on the number of homeless people subsequently seeking help from the Council.

3.3.3 Use of Census and other demographic data

3.3.3.1 Survey results

The other methods highlighted by Local Authorities in their questionnaire responses were used far less frequently than the first two, with census or population data being used regularly by only 27% of respondents. Of the regular users of this method, only 10% considered it to be perfectly adequate. Although 81% of regular users felt it to be reasonably adequate, 8% felt that the method was either inadequate or very inadequate. Use of census data tended to be limited to obtaining a demographic profile of the area and was not used to look specifically at the prevalence or likelihood of homelessness through analysis of the Sampled Anonymised Records System (SARS) for example, where details of individual anonymised households within an area can be traced over time.

A further 56% of responding Local Authorities used census data occasionally. Of the occasional users only 4% regarded it as perfectly adequate and a further

62% felt it was a reasonably adequate method. The remaining occasional users (34%) felt that it was either an adequate or very inadequate method for estimating future demand. Additionally, it is interesting to note that of the 13% of Local Authorities who had heard of this method but didn't employ it, almost a quarter felt that it was either a perfectly adequate or reasonably adequate method. Although census data quickly becomes out of date, Local Authorities' reviews and strategies do appear to recognise that it can provide a useful starting point for demographic profiling within an area. However only limited further statistical analysis has been undertaken and projections to specifically look at the potential need for homeless services were very few in number.

3.3.3.2 Discussion

This apparent unwillingness to actively engage with anything more than a basic level of statistical analysis may be due in part to a lack of skill base within the homelessness departments. This has been recognised as an issue in the Government's evaluation of homelessness strategies where concern was expressed about the changing role of homelessness staff who did not necessarily have the right skills to develop strategies. It may also be due to an inherent mistrust of statistics or a perception of statistics as a political tool that can be manipulated to suit a particular agenda. Statistics have nevertheless become the language of politics and persuasion (Dorling and Simpson, 1999) and have increasingly been required to justify resource requirements and shape future service provision.

3.3.4. Street Counts

3.3.4.1 Survey responses

Only 15% of respondent Councils said that they regularly used street counts as a way of estimating future demand for homeless services with just 14% of these considering it as perfectly adequate and 59% considering it as reasonably adequate. A further 41% of respondents used this method occasionally. 40% of the remaining respondents were aware of this method but chose not to use it, 62% of them considering it to be either an inadequate or very inadequate method of estimating future demand for homeless services. Street counts involve counting the visible presentation of street homelessness, with counts being limited to specific defined areas – usually urban, varying in scale, scope and timespan (George & Westlake, 1991; Australian Bureau of Statistics, 1999; DETR & Shelter, 1997). Exactly how such counts are conducted also varies widely, depending on access issues, definition problems, how well informed local services are about where rough sleepers may be, health and safety concerns, as well as the availability of counters and their agendas. This method is fraught with methodological problems. The perception of inadequacy of this method amongst Local Authorities is interesting to note. This method of assessing the size of a rough sleeping problem in a particular district was strongly advocated by Shelter and the Rough Sleepers Unit in the late nineties who tried to introduce a level of standardisation to street counting by setting out a strict methodology (DETR, 1996; SEU, 1998). Local Authorities had to adhere to the definitions and methods detailed if they wanted to be considered for additional Central Government funding to deal with any problem of rough sleeping that was highlighted, with a high count proving to be a main tool for attracting substantial funds from the Rough Sleepers Initiative to deal with the problem. However such restrictions on the method of counting inevitably led to an underestimation of the size of the problem with the obvious knock-on effects of difficulties obtaining funding and support in general to deal with what could be perceived as a small problem. Indeed, counting rough sleeping in this manner led to widespread cynicism and controversy around Central Government's claim that rough sleeping fell sharply in the three years from 1999 to 2002 (Winchester, 2002). These challenges have consequently led many organisations and Local Authorities to discard the practice of regular street counts.

3.3.4.2 Discussion

It is widely agreed that periodic street counts can only ever provide a very limited snap shot of a particular group of the homeless population, namely rough sleepers, at a specific point in time. Raw data obtained from such counts is recognised as inevitably being an underestimate of the size of the rough sleeping problem. The issues involved in counting rough sleepers are examined closely by Cloke et al (2001) and the research highlights many flaws in the method of street counts. The methodological difficulties of undercounting, overcounting and inconsistency regarding recording practices are the main failings of this method and the extent of underestimation is suggested as being as high as a factor of ten (Kenway and Palmer, 2003). This method would appear to be particularly inadequate for quantifying levels of homelessness in rural areas. More than 14 million people live in 145 rural Local Authority areas in England, representing more than one quarter of the country's total population (Countryside Agency, 2002). Research undertaken in North Lincolnshire using a different, but methodologically more sound, method of quantifying rough sleeping revealed over half of the 91 people counted as homeless during the period of the study had a recent or ongoing experience of rough sleeping, in a Local Authority district that, officially, had no problem with rough sleeping (Robinson, 2003). Although the inadequacy of street counts for determining homelessness levels at any one point in time is well recognised, it is also acknowledged that such methods are of limited value for ongoing policy and planning purposes (O'Connell, 2003). Nonetheless, Central Government still relies on this method for measuring the size of the rough sleeping problem (Department for Communities and Local Government, 2007).

3.3.5. Capture / recapture methods

3.3.5.1 Survey results

Given the improvement in the quality of the information obtained by such methods, it is a surprise to note that only 5% of responding authorities use this method regularly for future planning, with a further 13% stating occasional use. Almost 59% of responding authorities had not heard of this method before. Of the regular users 29% regarded the method as perfectly adequate, 43% regarded it as reasonably adequate and 29% felt it was inadequate. Of the 17% of respondents who had heard of the method but didn't use it, two thirds regarded the method as either inadequate or very inadequate.

3.3.5.2 Discussion

Capture/ recapture models offer a marked improvement on the traditional method of street counts for estimating the numbers of rough sleepers in a specific area and have proved to be a relatively successful way of quantifying the size of the current street homeless problem in an area (Shaw, Bloor, Cormack & Williamson, 1996; Williams & Cheal, 2002). The method is a reliable and valid one for assessment of the size of hidden populations and is increasingly being used to estimate the current size of street homeless populations. It has been used to provide estimates of the size of the street homeless population in Budapest (David, 2002), reliable estimates of the street homeless population in Toronto in Canada (Brent, 2007) as well as in Adelaide in Australia where the method produced estimates three or four times those produced by the Australian Bureau of Statistics census (D'Onise, 2007). This method uses at least two independent samples of homeless individuals in a particular area with the level of duplication of individuals in each sample then providing a multiplier to estimate the size of the total population of homeless individuals in the area (Shaw, Bloor, Cormack & Williamson, 1996, Williams & Cheal, 2001 & 2002). However, whilst this method has provided reliable, valid estimates of current levels of rough sleeping within Local Authority areas (Williams & Cheal 2001 & 2002), to date its use has not been extended to quantify the wider spectrum of homelessness as defined by the legislation and the method is designed to provide current numbers, not predict future levels. It is therefore only moderately helpful in providing useful statistics to local government for future planning. The method also has additional limitations in that it requires a level of skill and rigour to administer and to produce robust results. The survey results may be indicative of an underlying reluctance of Local Authority homeless departments to engage with any method perceived as technical or requiring specialist knowledge. Smaller Local Authorities may not feel that the benefits of using such a method, namely the increased accuracy in determining current levels of rough sleepers, outweigh the resource implications for carrying out such research. This may in part be due to a lack of understanding about the method and the erroneous close association with conducting street counts. In addition, some authorities may simply be reluctant to carry out such research if they feel unable or unwilling to deal with the results. Further, whilst it is acknowledged that this method is a more reliable and valid measuring tool, there is also an acknowledgement amongst practitioners that a more sophisticated approach to the study of the numbers of homeless people and the causes of homelessness is required due to the heterogeneousity of the conditions that are antecedent to homelessness (Williams and Cheal, 2001).

3.3.6. Predictive Statistical models

3.3.6.1 Survey results

Predictive statistical models also proved to be one of the least used of the suggested methods with only 6% of respondents using the method regularly and 13% stating occasional use. All of the regular users felt that such methods were either perfectly or reasonably adequate. A further 55% of responding authorities were aware of such methods but did not use them in estimating future demand for homeless services despite 61% of them regarding such methods as perfectly (11%) or reasonably (50%) adequate. 22% of responding authorities were not aware of and had not used such methods.

3.3.6.2 Discussion

This is not surprising. Statistical models where factors such as housing market trends are used to predict changes in the rate of homelessness (Quigley, Raphael & Smolensky, 2001) or figures are weighted to estimate total populations (Ardilly & Le Blanc, 2001), have been proposed as an effective way of predicting changes in the homeless population (Hudson, 1998; Quigley, Raphael & Smolensky, 2001). However such methods have not been widely tested in the field and are apparently not well known or used amongst Local Authority officers. Unfortunately, research to date has tended to concentrate on specific areas of potential influence such as house prices (Hampton, Heller-Dixon & Langham, 2002) or employment (Hudson, 1998) rather than attempting to incorporate all major influences and consequently, a comprehensive, valid model has yet to be produced for mainstream application. Reinking and Reijerse (2002) have attempted to use estimators to estimate the potential number of homeless people attending a particular health service, however only the frequency of visits was used in the analysis and a number of assumptions must hold for the estimates to be valid. As some baseline population size information is required for such analysis, this method adds little to the debate about predicting the size of the homeless population. Estimators are also suggested as a way forward when using structural equation modelling (Ullman and Bentler, 2004) to predict behaviour of the homeless population (Ullman, 2006). Again, whilst such a method may have its usefulness, a baseline population is required as a starting point and this is the eludiary issue when considering the problem of homelessness across the country. Although predictive tools are available in other fields, few if any appear to have been successfully adapted, tested or proven valid over time in relation to the field of homelessness. This is likely to be due in part to the lack of concensus in defining homelessness and the fact that relevant indicators of the issue are diverse, disputed and often nebulous. Nevertheless, there has been some helpful work done with predictive statistical modelling in relation to levels of homelessness. The small number of attempts that have been made vary in their conclusions.

Research by Hampton, Heller-Dixon and Langman (2002) used a time series approach to look at whether issues such as interest rates and house prices could predict homelessness levels but this research concluded that the elasticities were too wide to be used as accurate predictors. Research by O'Flaherty suggests that a model of housing markets, when combined with increasing income inequality, provides insight into the changing incidence of homelessness. The model suggests that homelessness arises when available property is expensive and of poor quality and argues that homelessness is therefore a result of decision making under extreme income constraints (O'Flaherty, 1996). However, this model is an attempt to explain homelessness rather than predict anticipated levels in the future and does not purport to provide a comprehensive explanation. Models produced by Quigley, Raphael and Smolensky however also found that moderate increases in housing vacancies and moderate decreases in market rents were sufficient to generate substantial declines in homelessness. Their research supports O'Flaherty's proposal that small changes in the housing market conditions can drastically affect those for whom housing costs consume a large share of their low incomes (Quigley, Raphael and Smolenksy, 2001).

Notably, the Scottish Executive Central Research Unit (Kemp, Lynch & Mackay, 2001) has produced some encouraging work on the correlation of structural and individual factors with homelessness but has stopped short of providing a workable model for use in estimating future need. This research analysed the trends in homeless applications across Scotland for the 1980s and 1990s and found support for a structural explanation of homeless. The research, which involved regression analysis, time series analysis and elasticities, showed a long-run statistical relationship between homelessness and the housing market, affordability, the unemployment rate, the level of employment in manufacturing as well as homelessness and a proxy measure of deinstitutionalisation. They concluded that the trend in homelessness and the variation in homelessness between authorities in Scotland can, to a significant extent, be explained by structural factors. (Scottish Executive Central Research Unit, 2001).

Sosin (1992) reported that future utilization of services and indeed homelessness itself was predicted by level of interaction with social services institutions as opposed to personal characteristics influencing participation. However this approach is limited in its usefulness for forward strategic planning of services for homeless people as the study population are those already homeless and this does not account for those individuals who are yet to become homeless. Ajzen (1991) has also attempted to provide a predictive model utilising a 'theory of planned behaviour' (TPB) which essentially uses a questionnaire to ask people's current intentions and then assesses the strength of those intentions. Within the field of homelessness there is some history of successfully using TPB as a base for hierarchical regression analysis to predict homeless people's service utilization (Christian and Armitage, 2002; Christian et al, 2003 & 2007). Likewise, research conducted in America concluded that the best multivariate model for predicting homelessness for individual families in the American welfare system would need to include ten predictors to reliably contribute to the prediction of homelessness. Even then, the model would only be successful at predicting 66% of homelessness amongst those families on welfare – the model also had a false alarm rate (type 2 error) of 10% (Shinn et al, 1998). This research was conducted with a view to predicting homelessness within particular families who were already linked in to the welfare system for support. It was not designed to predict estimates of homelessness within a geographical area and appears to have only limited potential to do so.

In a study by Craig and Hodson multivariate analysis suggests that childhood adversity, low educational attainment and the prior presence of psychiatric disorder all independently increase the likelihood of homelessness in a youthful population (Craig and Hodson, 1998) There has also been some important work undertaken in this area looking at homelessness in America by Hudson (1998). This research tested the hypothesis that to the extent that the capabilities of an area's workforce is mismatched with the structure of available job opportunities, and there are minimal and declining levels of primary and secondary institutional supports, that housing will become unaffordable for many and the progressively accumulating societal and individual failures result in high rates of homelessness. This research used structural equation modelling and found that individual disabilities of homeless people, such as mental health problems, had a much less important impact on homelessness levels than indicators such as urbanisation and racial minority status. The research also showed indicators of employment and unemployment to have almost no impact on homelessness levels. Deindustrialisation proved to have only a nominal impact on homeless levels and whilst the research did support the hypothesis that housing availability and affordability are important in explaining contemporary homelessness, it was not nearly to the extent that was expected (Hudson, 1998).

In addition to the lack of availability of effective models there appears to be a lack of expertise in this area available within Local Authorities housing departments. Proper use of predictive statistical methods often requires statistical knowledge or experience in research and this is likely to be limited within the department, particularly in the smaller Local Authorities. This issue is highlighted in a report for Shelter which states that "many officers responsible for producing the review and strategy did not have the necessary research and data analysis skills" (Dudleston, Alty & Henthorne, 2004).

3.3.7. Other indicators

3.3.7.1 Survey results

In the responses to the survey, a number of Local Authorities (approximately 10%) did recognise a link between fluctuations in the property market and levels of homelessness although no specific levels of correlation appeared to have been identified. Additionally, a smaller number of authorities (between 5% and 6%) said that they used analysis of what they considered to be the main drivers of homelessness (poverty and economic trends including interest rate changes and unemployment levels) to assist them in estimating future demand for homeless services in their area. Some Local Authorities considered that high teenage pregnancy rates would have an impact on future levels of homelessness but failed to translate these figures into anything more than a general conclusion that homelessness was likely to increase if teenage pregnancies were high. Other methods highlighted by responding authorities included monitoring use of temporary accommodation together with housing register waiting lists and the flow of available properties (approximately 10%) as well as the use of housing needs surveys (approximately 13%). A very small number of authorities contracted external providers to make an assessment of future demand and these tended to use demographic profiling as the basis for their projections. Approximately 4% of responding authorities said that their forward planning was based on monitoring current trends in approaches and 7% of authorities commented that estimating future demand was either extremely or very difficult. A small number of authorities (2%) confessed to not making future predictions at all!

3.3.7.2 Discussion

Relying on housing needs surveys to inform future planning of services for homeless people is not a very valid method. Housing needs surveys usually take a stratified sample of households within a Local Authority area and send them a questionnaire asking about the make up of their household, any existing housing need and any anticipated future need. The results of the survey are then analysed and extrapolated to the population as a whole within that Local Authority area. Whilst providing a general overview of housing need in the area, it is questionable whether such studies offer a meaningful contribution to informing the Council about homelessness in particular let alone future need for homelessness services. Housing need surveys can often only reach existing householders and often have a relatively low response rate. It is difficult for such surveys to reach those who are already homeless but who may have failed to engage with the Local Authority. Further, completion of the questionnaire is normally undertaken by the head of household rather than any households who may be hidden within the host household at the address and there are many reasons why such hidden homelessness, or possible future homelessness, may fail to be disclosed (for example, domestic violence or abuse, benefit implications or concerns over stigmatisation or discrimination).

There is some support in the literature for an approach that comes at the problem from a different perspective than housing supply and demand indicators. Fielder, for example, highlighted that immigrants in Vancouver were over represented in the homeless figures and identified that they tended to live in inner suburban locations. He therefore suggested that hidden homelessness was likely to be high in such areas and policy should respond accordingly (Fielder, 2006). Further, Sumner et al (2001) suggest that homelessness would be better assessed over a fixed period and then the figures weighted to account for the intermittent nature of homelessness. However, as they recognise, this raises methodological concerns over the calculation of appropriate weights.

One reason for the apparent lack of focus on future need may be the current system of government funding which relies on an annual bidding system and short term allocation of funds. Local Authorities submit an estimate of homelessness within their district to Central Government through the annual completion of the HIP Housing Strategy Statistical Appendix. It is on the basis of these submissions that national estimates are generated and resource allocation is determined and legitimised. This leads to uncertainty over future government funding and consequently severely restricts the capacity of Local Authorities to plan very far into the future even if they wanted to. This issue was recognised as a real difficulty for Local Authorities in the government's evaluation of Local Authorities homelessness strategies (ODPM, 2004d) and has started to be addressed by the Department for Communities and Local Government who have recently awarded a three year settlement for the first time, in order to facilitate longer term planning Department for Communities and Local Government, 2007d).

The Government's review of the Local Authority Homelessness Strategies showed a general failure of Local Authorities to identify the resources required to support their action plans, with only 30% managing to do so fully. Additionally, there seemed to be an acknowledgement by homelessness departments that they could not effectively tackle the homelessness problem on their own and that a wider strategic response was essential. However few considered funding opportunities outside their own budgets, funds from the homelessness directorate or the supporting people budget (ODPM, 2004d).

3.3.8. Interest in using other methods

3.3.8.1 Survey results

When the questionnaire asked whether the authority would be willing to consider other practical methods of estimating future demand, the overwhelming majority of responding authorities (83%) said yes. A further 14% of authorities were unsure – often quantifying this response with concerns over resource requirements for any new methods that were proposed and whether any such method would be recognised and endorsed by Central Government. Only 3% of authorities that responded to the survey said they wouldn't be willing to consider other methods.

3.3.8.2 Discussion

The Government's evaluation of the Local Authorities' Homelessness strategies highlighted that one in five authorities cited "difficulties over data availability and developing knowledge of all aspects of homelessness as significant weaknesses or gaps in their strategies, where further guidance from the Homelessness Directorate would be welcome". There was also a general recognition that assessing future levels of homelessness was difficult, that Local Authorities considered that there were no accurate predictors and that they would welcome more guidance on mapping future needs. (ODPM, 2004d).

The willingness to consider other methods of estimating need may well stem in part from the apparent inadequacy of existing methods as each of the methods highlighted above has their own difficulties and limitations. This view is echoed in the Consultation on Proposals for a National Homelessness Strategy: Analysis of Responses, where there was strong support for a revised methodology for collecting data on the extent of homelessness (ODPM, 2000) although it is interesting to note that only 24 Local Authorities responded to the proposals for a national homelessness strategy. The responses also highlighted a strong emphasis on the need to link homelessness policy with policies on benefits, health and crime and disorder strategies. Again, this desire for better strategic thinking appears to be overlooked by the majority of Local Authorities.

3.3.9. Influences on resource allocation

3.3.9.1 Survey results

When asked to what extent different factors influenced resource allocation within the homelessness departments, not surprisingly, 81% of Councils who responded stated that demand for services had a strong influence. Interestingly, approximately the same proportion of councils (80%) said that budget limitations also had a strong influence over resource allocation. When Local Authorities have a statutory duty to provide services to homeless people it is of some concern that budgetary limitations have such a strong influence on resource allocation. It adds weight to the hypothesis that budget limitations may be curtailing the statutory duties of Local Authorities, possibly forcing them to make restrictive interpretations of legislation and guidance detailed earlier in chapter one. Also of interest is that 25% of Councils highlighted that local councillors' attitudes and beliefs had a strong influence over resource allocation within their department, with a further 65% of Councils considering that Councillor attitudes and beliefs had some influence over resources. A slightly higher proportion (30%) of Councils stated that officer attitudes and beliefs had a strong influence on resource allocation within the department and perhaps of more concern is that 12% of Councils said that local public opinion had a strong influence over resource allocation within their department. Indeed, some authorities, recognised that, to effectively tackle the problem, it would be necessary to redefine homelessness and change public perception (Nuneaton & Bedworth Borough Council, 2003).

3.3.9.2 Discussion

Whilst Council Officers who are dealing with homelessness on a daily basis are likely to have a relatively clear understanding of homelessness within their Local Authority area, Local Councillors are perhaps less likely to be fully informed about the issues and may not be best placed to be influencing resource allocation to such a degree. With no consistent, objective method available for assessment of resource requirements and allocation, policies and practices will inevitably continue to be influenced by individual beliefs and attitudes. Further, whilst any individual or group of individuals have a significant influence over resource allocation, the system will be open to subjective judgements and potential prejudice and this is of particular concern where individuals come to the arena with a political agenda. This concern is echoed in some of the reviews and strategies. In Tunbridge Wells for example, the Council's final report highlights that there appears to be little political will within the Council to recognise the problems and address the issues around homelessness and that this is a serious concern (Tunbridge Wells Borough Council, 2003).

In addition to the highlighted influences, 8% of authorities who responded said that government monitoring in terms of performance indicators (including best value indicators) had a strong influence on resource allocation. This is perhaps not surprising given that Central Government funding is often dependent on how well Local Authorities meet their performance targets in various areas. When resources are already stretched, protecting existing funding levels may understandably be a priority over future requirements. Further, 7% of authorities pointed to what was happening outside of their control as having a strong influence on resource allocation. These issues included what resources were available, what issues had been given priority in other departments and organisations as well as what services were being provided by voluntary sector agencies in the area or neighbouring housing authorities. Social Services departments and supporting people funding were specifically mentioned as key influences, as was the effectiveness of existing services, policies and initiatives.

Whilst at a micro level, goals and objectives within different statutory and voluntary systems may be very different and potentially in conflict with one another, at a macro level, social policies and those working within the systems are attempting to improve the quality of life for the community as a whole and should mean that precious resources are not fought over by any particular department or agency to the detriment of those who need them. Central Government attempts to address this issue by requiring and encouraging partnership working at the strategic planning level. Indeed, section 1(5) & 1(6) of the Homelessness Act 2002 specifically state that the Local Housing Authority and the local Social Services Authority must take the homelessness strategies into account when exercising their functions. This refers to the Councils' general functions and not just to those directly concerning housing issues. The homelessness strategies must therefore link into other Council strategies, both at a district level and a county level. However this area seems to be given little more than lip service in the vast majority of Local Authority strategies with other Council strategies being listed alongside a non-specific statement that the homelessness strategy will either take account of or link in with the strategies of other departments within the Council. This lack of practical strategic interaction between departments is acknowledged with disappointment by the Government's review of the homelessness strategies (ODPM, 2004d). There is increasing pressure on councils' budgets with Central Government imposing limits on rises in local taxation. Areas of local government such as leisure and tourism, planning and environmental health, crime and community safety, affect a majority of the local population. Historically, homelessness affects a small minority of the population and consequently other services could be perceived as having a higher priority in the local community. Unlike other services within local government, homelessness does not bring revenue into the Local Authority and could be perceived as a drain on public funds. With departments competing for resources and the possibility of inter and intradepartmental conflict of objectives, there is the potential that homelessness will draw the short straw in terms of funding and policy priorities within the Local Authority. Indeed, some Local Authorities specifically referred in their strategies to an unwillingness of other departments and agencies to work together and share resources (e.g. Litchfield District Council, 2003). Further, the acknowledgement that changes in service provision within non-statutory sector agencies and even other Local Authority areas can impact on resource allocation within a Local Authority's homelessness department is arguably additional evidence to support the view that wider issues need to be factored in to the assessment of future demand. The perception of homelessness services as being predominantly a drain on public funds does not however consider the wider picture, where for example, resolving homelessness amongst offenders can have a positive effect on re-offending figures. Having stable accommodation reduced the risk of re-offending by one fifth (Social Exclusion Unit, 2002) thereby impacting on the crime and community safety of an area.

The financial costs of homelessness for a community have already been discussed (see 1.1.12 earlier).

3.4 Conclusion

Various methods have been employed to assist in quantifying the size of the homelessness problem. Some authorities rely predominantly on their past official returns to Central Government to inform the likelihood of future need, others tend to rely on information gained from consulting with other agencies within their district. These approaches are just a couple of examples of a number of methods used by Local Authorities to try to get to grips with the size of the problem in order that they can decide how best to respond. Assessment of the Local Authorities homelessness reviews and strategies clearly indicates that a significant amount of effort and resources, both locally and nationally, have been targeted at the issue of quantification of the population of homeless people. Whilst some degree of standardisation in measurement of part of this group was introduced by the Rough Sleepers Initiative measurement of homelessness in general is far from standardised. Attempts to try to establish a more realistic idea of the size of the problem at any one time have led to more sophisticated methods such as capture / recapture and common monitoring systems being used with varying degrees of success.

The methods employed by Local Authorities to try to predict future levels of homelessness are often unscientific, unreliable, invalid and vary from one Local Authority to the next, depending on the knowledge, experience and skills base of the homelessness officers in that Local Authority. Staff in the homelessness departments often do not appear to be aware that issues such as unemployment levels and interest rate changes can affect the number of people potentially needing help with housing. If there is awareness, departments still do not appear to have the tools to use this information in a sound methodological manner to estimate future homelessness. It would seem that it is challenging enough for Local Authorities to quantify and deal with the current homelessness problem and that they feel inadequately prepared and ill-equipped to consider future need. When this is attempted the methods used appear to provide unreliable and invalid information, often in a way that cannot be translated into hard figures and resource implications. Further, there seems to be no consensus of method across the country. Whilst there is some degree of consistency between Local Authorities in their approach to the problem of predicting future levels of homelessness, this consistency is based around the use of P1E returns, demographic profiling and collecting information from other agencies working in the area. Given the limitations of these methods discussed above, the fact that some consistency exists arguably does not contribute to the provision of a valid, objective assessment of likely future need. Any assessments of likely future levels of homelessness within a Local Authority area that are made remain nebulous and subjective and hence make comparison across the country and targeted responses difficult if not impossible. As long as different methods are being used by different Local Authorities across the country it will be extremely difficult for Central Government to compare Local Authorities with each other and apportion resources appropriately according to need.

While it is acknowledged that some satisfactory methods may exist for measuring current levels of rough sleeping, the quantification of the wider homeless population in a Local Authority area continues to pose significant challenges. Determining likely future levels of homelessness is far less chartered territory, with there apparently being no acceptable reliable or valid tools available for predicting likely future levels of homelessness. This may be partly due to the fact that until the recent changes in legislation there was no specific requirement on Local Authorities to take a longer term, strategic approach to their forward planning of homeless services. Consequently it appears that very few authorities have historically spent precious resources on this area. There is therefore currently no reliable and valid method of predicting levels of homelessness which all Local Authorities accept and can use as a standard starting point. Evidence suggests that statistical modelling may provide a useful way forward but, where such an approach has been explored in this field, it has focused on specific areas of social practice such as housing or unemployment rather than considering the wider picture of social, economic and demographic issues that may contribute to a situation of homelessness.

It would appear that there is a significant gap between the intention of government, both its legislation and guidance, and the practice of Local Authorities. Whilst Central Government has, quite rightly, directed Local Authorities to take a more strategic and inclusive approach to homelessness, it has apparently failed to ensure that they have the resources to do so in terms of expertise, tools and funding. This is despite Prime Minister, Tony Blair, specifically stating that his government would provide the tools (ODPM, 1999). The methods currently employed by Local Authorities to assess the existing and likely levels of homelessness in their area appear to be inadequate in that they do not provide a comprehensive assessment of the problem and are open to subjective judgements by various influential parties within the authority. Additionally, there is some evidence to suggest that budgetary limitations and other pressures from Central Government such as the requirement to end the use of bed and breakfast accommodation may be restricting or undermining Local Authorities in their attempts to be more realistic about the size of the problem. The government has also invested significant political capital in defending the gains it claims to have made through its policy approach to tackling homelessness and rough sleeping in particular and is therefore like to be resistant or discouraging to alternative methods that may undermine those claims and portray a more realistic picture (Robinson, 2003).

It is clear that the current systems within Local Authorities can only show one part of the picture and that it will be necessary for other agencies in the area to be included in the assessment and contribute if a clearer view of current and future levels of homelessness is to be achieved. Previous legislation and guidance appear to have generated a significant improvement in communication between agencies at a local level (Dudleston, Atley & Henthorne, 2001) in some areas of the country and this multi-agency liaison has undoubtedly been improved by the requirement on local councils to carry out a review of homelessness in their area. This in itself should be viewed as a positive step towards a more comprehensive understanding of current and future local homelessness. There remains however a large gap between being able to gather together the collective knowledge of the situation in a Local Authority area and being able to use this knowledge to effectively inform strategic planning and resource requirements. How to count a population that is hard to accurately define, often hidden and constantly altering presents a significant challenge in itself. This is without considering the added complications of trying to predict future levels when there are a vast number of factors, both personal and structural, that could influence the numbers. Government guidance falls short of providing detailed direction on producing helpful figures which Local Authorities can utilise in estimating future levels of homelessness. Whether this is by design or omission is debatable, given that numbers attract attention and provide a framework within which resources are allocated (Robinson, 2003). Few Local Authorities undertake detailed statistical analysis in an attempt to estimate future need. The tools currently available to Local Authorities are, generally speaking, tools for measuring current levels of homelessness, usually street homelessness. These tools are not designed or suitable for predicting future levels of homelessness. However in the absence of adequate, purpose-built tools Local Authorities are trying to use what is available to them as a basis for future planning. Given their inadequacies for this purpose many authorities seem to adopt a 'best guess' approach and some admit to not even attempting to estimate demand beyond the immediate few months if at all. What is lacking is effective tools for predicting likely future levels of homelessness which encompass the bigger picture and view homelessness as an integral part of a greater social picture rather than as an isolated housing issue, an inconvenience or a costly embarrassment. A statistical model which takes account of associated issues could arguably, not only provide a clearer picture of anticipated levels of homelessness but it could also provide additional evidence to support and direct multi-agency or interdepartmental collaboration on the issue. Whilst estimates continue to be ad hoc and statistically unreliable it is hard to see how an effective, longer term strategic response to the problem can be formulated and how the recent legislation can achieve its alleged intention of expecting Local Authorities to be effective in tackling homelessness. Ultimately, if agencies cannot quantify the problem they are seeking to address they cannot hope for resources to deal with the issues (Hutson and Liddiard, 1994).

Chapter 4 – Methods used for establishing current practise and methods used in the statistical analysis

4.0 Introduction

There is currently no standard, statistically reliable or valid method or model being used by Local Authorities in England for predicting future levels of homelessness. Further, there is very little evidence that research has been conducted to develop such a model, encompassing statistics beyond the narrow limitation of one or two social policy areas, such as housing statistics or unemployment statistics, despite continuing links with other issues being drawn from both quantitative and qualitative research in the field of homelessness. The purpose of this research was to explore whether it is possible to produce a forecasting or predictive model which does encompass the major issues that may be considered as precedents to homelessness. This chapter details how this was investigated and explains the steps taken to achieve a possible model. The chapter details the methods used to establish current practice, specifically the survey of Local Authorities already discussed at length in Chapter 3. The large remainder of the chapter describes the methods used for the exploratory statistical analysis. Initially, there is a description of the general design followed by a detailed overview of the sampling method including information on how the sample was sourced. There follows some general comment about the use of statistics as well as the criterion for data selection for the purposes of this research. There is an explanation of how the databases were constructed followed by a detailed description of how the predictor and outcome variables were selected. This includes an overview of the search to locate appropriate data for use in the analysis as well as the availability and suitability for data found for each category.

After outlining how the indicators were chosen, the chapter provides details of the statistical methods used for univariate, bivariate and multivariate exploratory analysis. The univariate analysis considers distribution of the data, reliability of the indicators, the possibility of subgroups and group distribution within these groups. The requirements for parametric testing are outlined and the methods used for transformation of the data are also detailed. Analysis of variance is also checked where possible. The chapter then describes the bivariate analysis undertaken, including distribution and correlation assessments. The issues of time lag (or the sleeper effect) and collinearity are addressed and the possibility of using factor analysis to reduce the collinearity within categories is also discussed. The chapter then highlights how partial correlation was used to check for spurious or intervening variables.

The remainder of the chapter looks at the methods used in the multivariate stage of the analysis, initially considering methods used in other research and how many predictor variables would be appropriate. The chapter details the methods used for multiple regression, how the issue of multicollinearity was managed and details of the methods used for factor analysis. The argument for simple regression is put forward towards the end of the chapter and there is also a brief discussion on the possible use of path analysis and modelling at different levels of the administrative hierarchy. The chapter then describes methods used for testing the model. The results of the various stages of the exploratory statistical testing undertaken detailed in this chapter are discussed step by step in the same order in Chapter 5. The results of testing the models obtained are discussed in Chapter 6.

4.1 Methods used to establish current practice

As discussed in chapter three, initially all Local Authorities in England were surveyed regarding current methods used to predict levels of homelessness in their areas. This was undertaken by sending them an emailed questionnaire. In order to try to accurately target the right people in each Local Authority area, each Local Authority was telephoned prior to the email questionnaire being sent out and asked who was in charge of strategic planning of homeless services for the authority. This telephone call often meant being passed from one person to another in the authority but often finally resulted in the provision of an email address for a named person within the authority. A database of this information was compiled and used as a contact list for correspondence. One main issue highlighted by this process was that decisions on expected need and future resource requirements within the homelessness sections of the Councils were made by staff in different roles, often at different levels depending on the authority. Sometimes it would be the homelessness manager, sometimes the housing manager, sometimes it would be a policy officer and sometimes it would be a member of staff specifically employed for the purpose of drafting the Homelessness Review and Strategy for the authority. Where the telephone call failed to generate a named individual, the Homelessness Review and / or Strategy document for the Local Authority was checked to see if it specifically referred to a particular member of staff as being responsible for this role and where such reference was made, the email was sent to them. In the absence of a named individual, the questionnaire was sent to the general email address of the homelessness section or the homelessness manager as detailed on the Councils' website information or obtained from the telephone call. There were 5 Councils who were not willing or able to receive the questionnaire by email and these were consequently not surveyed. There was also a covering memo sent with the questionnaire explaining the purpose of the research and asking the recipient to forward the questionnaire to a colleague if they felt someone else would be better placed to respond to the questions asked. Chaser emails were sent to try to increase response rates and a thank you email was sent to those authorities who responded. Once the results of the questionnaire had been analysed a summary of the findings was sent by email to all Local Authorities who had been contacted. Copies of the correspondence to the Local Authorities can be found in appendix one.

4.2 Methods used in exploratory statistical testing

4.2.1 General design

In order to explore whether it is possible to predict levels of homelessness from other associated social issues, it was decided that descriptive and analytical techniques would be employed. As it was the intention was to explore the effects of more than one independent variable (the associated social issues) on the dependent variable (homelessness), regression modelling was considered to be the most appropriate method. The reasoning behind this decision is more fully detailed in **4.2.12** below. Reasons for the analysis decisions used throughout the research process are more fully discussed throughout this chapter.

A potential forecasting model is normally constructed from pertinent data and available theory (Abraham and Ledolter, 1983). As discussed earlier, there is significant theory on what may cause homelessness or at least what issues may commonly precede homelessness. It is possible however that the theory may be incomplete. Additionally, historical data must be used to specify an appropriate model. Unfortunately, undertaking a study based on retrospective data causes methodological problems as practice and policy changes over time, both in homelessness and in the associated social policy areas; and there is therefore the potential that the research is evaluating outdated practice (Third, 2000). Ideally, any model and its parameters should stay constant during the forecasting period in order for a model to be stable. In terms of how this relates to homelessness and the associated issues, it would appear that these would essentially be relatively stable over the time periods considered. Whilst it is acknowledged that the causes of homelessness may have changed over time, for example due to economic fluctuations, bad harvests, disease and war (Humphreys, 1999) these changes in the macro key triggers of homelessness are arguably not relevant to current short term forecasting and the objectives of this study.

4.2.2 Sampling

The sample used in the statistical analysis consisted of 353 of the 354 Local Authority administrative areas in England. The sample of administrative areas used in this analysis was sourced from a Central Government website which provided an A to Z directory of all local Councils in Britain www.direct.gov.uk.

There were a number of issues to consider in relation to the size of the sample and the method of sampling used in the research. It is recognised that, up to a point, the larger the sample the greater the accuracy and that sampling error can therefore be reduced by increasing the sample size. Although a stratified sample of the different types of Local Authorities could have been used as a basis for this research, there is no guarantee that this would have been a representative sample. Whilst there were commonalities between different Local Authority areas such as size or council type, there were also a variety of differentiating factors, such as population density and location, which made it difficult to determine whether a stratified sample would be representative of the population of Local Authorities. Further, the benefit of greater accuracy offered by such a sampling method is arguably not relevant if the sample size is equal to or close to the size of the population. The intention was therefore for the sample to be as large as possible within the parameters of the population and any obvious time and resource constraints.

For legislative purposes, the United Kingdom is subdivided into four discrete areas; England, Scotland, Wales and Northern Ireland and the law in relation to homelessness is different in each of these areas. For this reason, it was decided to restrict the study area to England in order that all Local Authorities included in the study would be subject to the same legal duties, responsibilities and resource issues. The predominant concern was that the findings from the sample could be transferred to the population as a whole. It was therefore decided that all Local Authorities within England would be included in the sample. Information and data were readily available for the whole country and it was the intention to undertake secondary analysis on existing data rather than generate new data. Therefore dealing with such a large sample was not considered to be unrealistic in respect of the time and resources required for analysis. Further, a large sample is more likely to produce distributions closer to the normal curve and would therefore be better suited to statistical analysis that relies on such distribution. Also, by having the maximum sample size available, it was thought that there would be sufficient data to allow meaningful analysis of sub-samples to explore any potential differences in the model that may exist between different types of council. Additionally, although there were 354 local housing authority areas at the time of the commencement of this research, the authority for the City of London was excluded from the study as it has functions which make it distinct from most Local Authorities including extra-territorial possessions and services elsewhere in greater London and, as such, might potentially bias results. The sample therefore consisted of the remaining 353 Local Authority areas in England. Using a sample consisting of administrative areas led to a large amount of the data used in the initial analysis being 'count data'. That is to say the data for each of the potential outcome variables were already cumulative totals and consequently bought any inherent bias or recording errors with them into the analysis. Such administrative data does not normally comply fully with the National Statistic Code of Practice. Counts are also unlikely to be normally distributed and such data does not generally satisfy the strict statistical standards usually required for techniques such as regression analysis. The inaccuracies and short-fallings of in relation to the potential outcome variables are fully detailed in **1.2.1** and **3.3.1.2** earlier and the decision to use such count data in this analysis is further debated in **4.2.4** below. The use of count data also presented as an issue with a number of the predictor variables. Whilst count variables would not routinely be analysed using multiple regression due to their distribution, transformation proved effective in normalising distribution and making the count data more acceptable for regression analysis as detailed later in **5.1.1.6**

4.2.3 Statistics

If other associated social issues are to be considered in attempts to address homelessness, it is necessary for a common language to be used for comparison – essentially, the problem of comparing incommensurate data exists and needs to be addressed in some way. Each issue will have its own factors which are likely to be incomparable with those of another issue. The most obvious solution to this quandary is to use statistics in making comparisons and analysing trends. However, it is necessary to tread very carefully here as numbers are of considerable importance in determining what aspects of a problem are responded to, where and in what way. If data were to be sourced from organisations with potentially subjective agendas, using such data could potentially undermine the impartiality and credibility of the research. Being a social construct, fraught with definitional, causal and political ambiguities, there is currently no consensus regarding exactly what issues should be examined in relation to homelessness and to what end. While it is recognised that it is very difficult to use numbers as a sole representation of social problems such as homelessness (Cloke et al, 2001), a problem needs to have definition and parameters in terms of its size in order to determine effective solutions. Exploratory statistical modelling on this issue was therefore considered to be worthwhile despite the potential for dissent on potential inclusion of certain issues.

In order to mitigate concerns and assess the availability of statistics for potential modelling, the accessibility and usefulness of the statistics also needed to be considered. If Local Authorities are to be willing and able to consider statistics for associated issues when trying to anticipate homelessness levels, the statistics need to be readily available in a form that is helpful to them. Arguably then, in order to be useful for modelling purposes and helpful to Local Authorities in estimating homelessness levels, statistics for associated issues should:

(i) Be readily available, as new information can be expensive to generate (Spiker, 2004),

(ii) provide data for the Local Authority geographical area without the need for aggregation or disaggregation by the authority,

(iii) be widely accessible and not require special permission or skills to access (Robinson, 2003) so that homeless officers of differing skills and experience can use the resource,

(iv) be reliable and from recognisable, credible sources so that credible results can be obtained from further use of the data,

(v) be relatively 'raw' so that further use and analysis remains meaningful.

(vi) be available at a local level and available in a collated form for all authorities across the country. Sourcing every statistic for every Local Authority area from a local search would not be practically feasible for the purposes of this research and could increase the likelihood of reliability problems.

As a large proportion of the potential variables were essentially 'count' variables, there was some concern about the limitations this might impose on analytical potential. In particular, it was acknowledged that it would not be possible to draw inferences for individuals from relationships in the data from units of analysis which represent aggregations of individuals in administrative areas. Whilst this was a significant limitation, the purpose of the research was not to explain or draw inferences about individual homelessness but to try to predict levels of homelessness within an administrative area. The use of such data was therefore considered as quite appropriate for the task with the caveat that any conclusions at an individual level could not be drawn.

To prepare for the data analysis stage of the research, a database of available and relevant statistics was compiled, initially using Excel for data input. The data files were then transferred to SPSS for analysis.

For the purposes of analysis, missing values were allocated the value of -99 and it was considered appropriate to use the complete-case (listwise) technique for analysis. Namely, to base the analysis on the completely observed cases and discard the incomplete cases. This was appropriate as the data that were missing were considered to be independent of the observed value as well as independent of the other missing values. Additionally, the percentage of incomplete cases was less than the acceptable level for obtaining efficient estimates (20%) as recommended by Jamshidian (2004). The complete cases would therefore essentially still be a good sized, random sub-sample of all the cases in the data set and therefore lead to unbiased estimates. This method was considered preferable to available-case analysis (pairwise) which uses the largest possible set of available cases but can lead to biased estimates (Field, 2005). Other methods such as the mean imputation method were also considered but rejected on the basis that imputation can also lead to biased estimates. Likelihood-based or simulation-based methods were also considered as they make more efficient use of the data and can therefore increase validity of analysis (Jamshidian, 2004). However they are much more complicated to use and interpret and it was felt that, due to the large number of complete cases available in this research, the costs of using such methods outweighed the benefits.

The main database comprised a sample of 353 local authority administrative areas. Although the original intention was to base analysis on statistics available at Local Authority level, the literature review highlighted links with subject areas where statistics were only available at county level; such as the numbers of children in need or those being looked after by social services. Additionally, there were other potentially relevant statistics that were only available at Primary Care Trust Level (PCT); such as numbers of mental health admissions and discharges. A database was therefore compiled for each level of data available, with statistics for the outcome variables being amalgamated where appropriate to match as near as possible to the geographical area of the other data sets. These databases were constructed to allow for the potential to explore associations between social issues and homelessness levels in different administrative units, should there prove to be insufficient indicators for the associated social issues at Local Authority level or if there were strong correlations at PCT or county level data that could not be ignored. As stated above, the Local Authority level database consisted of 353 local Authorities administrative areas. The County level database was made up of 149 administrative areas including all local authority areas. Both of these databases excluded the authority for the City of London from the samples. The Primary Care Trust level included 199 administrative areas, consisting of a combined total of 238 of the Local Authority areas. This second additional database was the most problematic to construct as, although the PCTs had originally grown out of health authority areas which did link with local council areas, the geographical boundaries of the Trusts had changed over the years since formation and consequently did not always clearly correspond to the administrative boundaries of the various Councils. In such circumstances, judgements had to be made with regard to amalgamation of figures which are obviously open to error and would therefore threaten the validity of a potential model that included data at the PCT level. To minimise this concern, the database only included PCT areas that clearly related to Local Authority areas and the website of each trust was checked for details of the geographical locality covered. If the locality did not clearly correspond to that of one or more Local Authority areas it was excluded from the sample. It is recognised that this method of sampling may well have introduced sampling bias to the data but given that this method produced a relative large sample of the population (67%) and there were only two possible independent variables at PCT level it was felt that the potential for bias was minimal.

4.2.4 Dependent variable selection

The dependent variables included in the initial stage of univariate analysis were the quarterly counts of total homeless decisions and total homeless decisions resulting in the full duty to assist, made by a local authority between 2000 and

2004. The data for some quarters in 2000 was unavailable. The annual counts for each authority were also included as potential dependent variables. This made the total number of variables available for consideration as possible outcome variables 45. The variables were coded in chronological order for ease of reference and a full list of the potential variables and their codes can be seen in **Appendix 2**. The two outcome variables finally chosen to be used in the multivariate analysis were 'total number of homelessness decisions for 2003' (coded as T2003d) and 'total number of homelessness decisions for 2003 resulting in the full duty being accepted' (coded as T2003fd). These were not selected until after extensive univariate and bivariate analysis was carried out (see **5.1.1.1** through to **5.1.1.8** and **5.2.4** below for full details).

In deciding which variables should be included in the exploratory analysis, the primary issue to be addressed was that of the dependent variable. The key concern was the limited statistics available that could potentially represent the dependent variable of homelessness. This produced a rather circular debate – the existing figures of known homelessness do not adequately reflect the reality of the problem as discussed above, yet without figures on past levels of homelessness it is very difficult to construct a model to more accurately predict future levels of homelessness. In some areas, more detailed information on homeless numbers was available, particularly areas that had been involved in the Rough Sleeping Initiative (RSI) where detailed statistics on rough sleepers had been collected. However, these areas were limited in number and tended to be larger urban centres due to the nature of the RSI scheme. Consequently, a sample made up of these council areas would not have been representative of the population of councils across the country and in any event, rough sleeper numbers could not be considered as evidencing homelessness in the area. There were also collated statistics from voluntary sector agencies about the size of the homeless problem within particular council areas however, as highlighted in the previous chapters, this information was collected by different people for different purposes and was not collected consistently across the country. Rough sleeper data could not therefore be considered as reliable or valid for modelling purposes in this instance. The only statistics available nationally that could potentially represent homeless numbers across the country with some level of consistency were those contained in the official returns to Central Government, the P1E returns. Whilst it is acknowledged that there are many shortfalls to these figures, the stark fact remains that they are currently the only statistics available across all Local Authority areas which are remotely adequate for national modelling purposes.

Even with the decision to use information contained in the P1E returns as the dependent variable reluctantly made, it was still necessary to decide whether number of applications or number of acceptances would be the most appropriate measure to use for exploratory modelling. Each homeless application to the authority requires processing. Enquiries need to be undertaken, temporary accommodation may need to be arranged, and a decision needs to be made and notified to the applicant. The level of revenue resources needed for this process depends on the complexity of the individual case and not on whether or not the authority will ultimately accept a full duty to assist the applicant. As the purpose of a potential model was to ideally provide a more accurate assessment of resource requirements within Local Authority homelessness services, it was decided that application figures would be the preference but to also consider the use of 'full duty' figures, depending on the initial correlation analysis. Unfortunately, figures on applications were not available. The next best option was to use figures for total number of decisions made. However, this did not include those applicants who fell out of the system for some reason before a decision was reached on their homelessness status and consequently, for this and other shortfalls in the data discussed earlier, the figures are recognised to be an understatement of the size of the issue from the outset.

4.2.5 Independent variable selection

In deciding what independent variables were to be included in the analysis and the exploratory modelling, a number of issues were considered. The individual associated issues needed to be operationally defined. Indicators help to define concepts and can be made up of a number of measures (or variables) or can be just one variable. It was therefore necessary to decide whether to include indices, individual measures or a combination of the two as the independent variables for this research.

The main problem was the vast number of possibilities available. It was necessary to try to include variables that were rooted in each of the theoretical issues highlighted in chapter two. The problem was that this meant attempting to include variables for each of the nine associated issues detailed previously. This in itself was not straightforward as some of these issues, such as relationship breakdown, were concepts which were themselves hard to clearly define and provide valid measures for. Although valid and tested indices existed for concepts such as deprivation, which prima facie appeared to cover a number of the issues highlighted, it was felt that they could not be utilized due to issues of reliability, transparency, credibility and meaningfulness. Reliability issues arose (for the purposes of this research) due to the fact that indices that are reliable within a particular social context or at a certain period are not necessarily transferable to other circumstances (Spicker, 2004). Additionally, the indices encompassed a wide range of factors, not all of which were immediately obvious. Not all of the factors encompassed within an index could justifiably be included in a model of homelessness as there was a lack of theoretical evidence directly linking the issues with homelessness. Exclusions within an index could also potentially lead to important issues being ignored; housing standards, for example, now rarely feature in indices of deprivation yet, as detailed earlier, research shows that housing standards materially contribute to situations of poverty and housing need. Further, including for example, an index of deprivation as an indicator did not strictly meet the objective of including indicators under the various headings of the issues identified – deprivation may have links with poverty but is not the same as poverty. With homelessness encompassing a multidimensional set of issues, there is the problem that indicators may not fully reflect the range of issues that are of concern (Spicker, 2004). The use of indices in an exploratory model could therefore potentially cause loss of credibility. Finally, it was important that the figures used remained meaningful throughout the exploratory modelling process. The main difficulty with using indices as indicators is the problem of attaching value to changes in the indicator. Indicators are, by definition, signposts to the issue, not the issue itself; and the validity of the signpost depends more on the theoretical relationships of the elements of the indicator than the precision with which they are based or the numbers allocated to those relationships. Indicators that are amalgams of a number of different measures therefore present difficulties in relation to statistical analysis. The construction of indices tends to presume a linear mathematical relationship (Spicker 2004) and having to accept the assumption of such linear mathematical relationships between incommensurate types of data from the outset of analysis created unnecessary methodological concerns. These were over and above those of aggregation and quantification. The use of such indicators would not therefore be conducive for meaningful statistical analysis as using an amalgamation of data could not keep the statistical analysis meaningful. For these reasons, a decision was taken to use individual measures rather than indices as indicators. Additionally, interval or ratio variables are considered as much more useable for statistical analysis due to the fact that more statistical tests can be applied to them. It was therefore the intention that the independent variables should ideally be interval or ratio variables. However, even when apparently suitable measures were available, the question of which to include and which to exclude still raised concerns.

No set of indicators can be exhaustive, and there are costs in terms of lost transparency from having too extensive a range of indicators. Too large a set of indicators risks losing credibility (Atkinson et al, 2002). How many indicators to include for each of the associated issues highlighted was also a concern. In addressing this concern, careful consideration was given to the issue of whether to include the same number of indicators in each category. The concern was that by doing so, equal weight would potentially be given to all the issues when the evidence did not point to this being the reality. Over inclusion can lead to excessive weight being given to particular factors (Spicker, 2004). For example, in this case, the evidence for sex being a significant issue for preceding homelessness is arguably not as compelling as the evidence available for ethnicity or poverty. Whether this is because the later issues are in fact more significant or because there is simply less research into the question of whether sex is a significant precedent factor to homelessness we can only speculate.

The limitation of the number of potential indicators available under a particular heading also proved to be a constraint in the decision making process. If there were only one or two potential variables identified or available for one category, the number of potential variables for other categories had to be restricted proportionately so as not to introduce further weighting concerns. The whole issue of weighting depends partly on appropriate quantification and partly on normative judgement and it is therefore acknowledged that the weighting implications regarding the inclusion of independent variables is open to debate.

There was also concern that the more indicators that are used, the more people are going to be defined as falling into the issue being investigated. If indicators are not collinear, each will have an area that does not overlap with others – if they identify different problems, the population they refer to will increase. (Boltvinik, 1996; Spicker, 2004). Taking this to its obvious conclusion, inclusion of a large number of indicators could demonstrate the population of potentially homeless people to be vast and could consequently lose any credibility for any potential model. However, there was nevertheless strong evidence to support the inclusion of many of the various associated issues into the model. In particular, research by Lemos and Goody (1999) indicated that single people were likely to become homeless as a result of the interaction of three or more of a list of reasons including drug or alcohol abuse, long term relationship breakdown, mental health problems, unemployment, leaving prison, eviction, leaving care, violence and bereavement. This idea of compound or cumulative difficulties causing homelessness is well recognised (O'Leary, 1997; Randall and Brown 1999; Watson, 1999; ODPM, 2003e, 2004d, 2005b & e) and would suggest that an absolute minimum of three independent variables should be included and ideally there should be sufficient variables to cover the main subject areas identified as being common precursors to homelessness.

4.2.6 Statistics available on associated issues

From the outset it became clear that while reliable, valid statistics for the various subject areas may have been available within a Local Authority area, they were often not available as a data set for the whole sample of Local Authority areas in England and it was simply not feasible, given the resource limitations of this research to collate the individual data sets. The search for relevant statistics therefore started with statistics that had been collected at Local Authority level and might be available from Central Government, the most obvious source being the census of 2001. The web address www.statistics.gov/uk/census2001/ provided a list of key statistics for Local Authorities in England and Wales. This list referred to several tables of statistics that related to some of the various associated issues detailed below. Information contained in the General Household Survey was also briefly considered but then excluded from the research because the statistics did not specifically relate to the Local Authority areas in the sample, but rather were based on the responses of a sample of 13,250 individuals across the country. The search for suitable datasets was then widened to include the various government departments responsible for overseeing the issues highlighted as possible precedents to homelessness and then to non-government sources such as national voluntary or independent organisations. More information on the possible sources and statistics for the various issues are detailed under the headings below.

4.2.6.1 General demographic variables

In addition to the variables included under the headings below, a few general demographic variables were included in the initial analysis. Specifically, size of Local Authority area, total population of Local Authority area, type of Council, number of males and females resident in the area and population density. All of these variables were sourced from the Census 2001 data from the Office of National Statistics. The variable 'council type' is the only nominal variable and has 7 categories as fewer than 6 or more than 20 categories could distort the shape of the distribution of the variable (Spiker, 2004). These categories were essentially self- defined by the names of the individual Councils and are discussed further at 4.2.10.3 below.

4.2.6.2 Housing

The Office of the Deputy Prime Minister at www.odpm.gov.uk was the primary source used for possible statistics on housing issues (now www.communities.gov.uk). The figures for the dependent variable were obtained from this source and it was possible that this source may have been able to provide other relevant data for potential independent variables. Sources of statistics on housing need are various and a report for Crisis details some relevant sources as; Local Authority's homelessness statistics, environmental health departments, housing benefit sections, local house condition surveys, local newspapers, letting agents, Joseph Rowntree Foundation's Index of private rents, DETR's rent officer statistics for local reference rent determinations, the decennial census, Local Authorities' and registered social landlords' housing stock and lettings data, Local Authority's housing advice statistics, DETR's Housing Investment Programme data, Housing Corporation's CORE general needs housing lettings data, rough sleeping counts, social services statistics, probation service statistics, health authority statistics, voluntary organisations' data, housing needs surveys (Evans, Zimmick, Hutson & Smith, 2001). These are just some of the housing related statistics that are available to inform our view of housing need. By their very nature however, they are limiting, in that, on their own, they just look at one small aspect of the issue and do not provide insight into how they fit into the wider picture of homelessness. Further, there will inevitably be reliability and validity issues within the individual data sets. This is well demonstrated in a report looking at access to housing for low income single people which highlights a range of gaps and inconsistencies in the available statistics and other data sources on single peoples housing needs (Anderson, 1994). Nonetheless, each of the sources referred to by Crisis were checked for possible usefulness in this research. Some of the local sources such as local newspapers, local house condition survey, letting agents and rough sleeping counts were discounted in relation to this research as information from these sources could not provide consistent, reliable data for all, or even the majority of Local Authority areas included in the sample. Housing Needs Surveys were also rejected as a possible source for relevant statistics as such surveys are carried out by different researchers, over different areas at different times and collect different information in different ways. Not only did this mean that consistency and reliability could not therefore be assured but it also meant that the results from housing needs surveys across the country were not collated in an accessible form.

Environmental Health Departments hold records on houses in multiple occupation and properties that may not be fit for habitation, as well as details of bed and breakfast establishments in the area. These figures were not accessible on a national basis and again, posed problems of consistency across different Local Authorities. These concerns were also applicable to data available from the Local Authority housing advice and housing benefit sections. The value of the figures held as potential indicators of the housing situation in the area was also questionable. Whilst the statistics did provide some insight into a small part of the picture, it was felt that on their own they did not constitute adequate indicators for the purpose of this research. The signposting to probation, social services, the health authorities and the census as a source for homelessness indicators was helpful in reinforcing the links between housing need and the associated issues but, for the purposes of this research, it was felt that indicators that referred to housing issues directly were more appropriate under this heading. The various potential sources highlighted by Crisis as having links to housing were however searched with specific reference to some of the other associated issues detailed below. Voluntary organisations statistics were also considered and generally rejected as possible sources for indicators for this research due to the lack of consistency and completeness across the whole country. However, national voluntary sector organisations such as Shelter, Crisis and Centrepoint were considered as potential sources of relevant statistics as they used rigorous methods for data collection and assimilation and the organisations were concerned directly with housing and homelessness. Whilst these organisations were able to provide detailed statistics on their contacts, they were not generally able to provide comprehensive statistics on housing in individual Local Authority areas and even where this was possible (in the case of Shelter for example) the information was not easily accessible by those outside of the organisation.

DETR's Housing Investment Programme was considered as a source for relevant data. This programme is an annual bidding process carried out by every Local Authority and is for housing capital resource allocation from Central Government. The funding is based partly on indices of relative need and partly on a discretionary basis linked to assessments of authorities' relative performance (DETR, 2001). Although figures would therefore be available for all Local Authority areas the process relies on the construction of indices and involves substantial subjectivity in both the application process and the allocation of funds. For these reasons this potential source was also rejected.

The Housing Corporation's CORE general needs housing lettings data is a tool for managing housing costs and assessing affordability. It also provides a comprehensive database on the characteristics of new social housing tenants and the homes they rent and buy. Local Authorities only started recording lettings on this system in April 2004 (Housing Corporation, 2005). This research looked at data between 2000 and 2004 and the CORE system information would not provide comprehensive social housing lettings figures for this period. For this reason the CORE system was considered an inappropriate source for statistics for the purposes of this research.

Whilst rent levels and house prices were perhaps the most obvious housing indicators to consider under the Housing heading, the Joseph Rowntree Foundation Index of private rents referred to above was not used as, although it provided data at local district level, by definition it was an index and the use of indices had already been discounted. Instead, statistics on average prices of properties were obtained from the land registry at www.landregistry.gov.uk as registration with the land registry is compulsory following a sale and all house sales would presumably therefore be included in the data. Unfortunately, data was only available at the County or unitary authority level and excluded a number of transfers such as right to buy sales at a discount which would have distorted the average. The exclusions meant that the data was not a comprehensive picture of the cost of housing in the area. In addition to this issue, for the areas such as West Yorkshire, South Yorkshire, Tyne and Wear, West Midlands, Greater Manchester and Merseyside where the data was only available at a regional level, the average for the region was applied to each Local Authority area within the region for the purposes of analysis. This generalisation affected 36 Local Authorities. Additionally, detail for the Isle of Wight was not provided in the Land Registry Statistics. In respect of an indicator for rent levels, it was considered that social housing rents would be a better indicator than general private sector rents as this would avoid any potential distortion caused by rents for private sector property at the top end of the market in the area. Rental figures for social housing one bed and three bed properties for all Local Authority areas were therefore obtained from the Office of the Deputy Prime Minister at www.odpm.gov.uk.

4.2.6.3 Poor health

Although statistics were available from the Department of Health at www.dh.gov.uk via www.hesonline.nhs.uk the statistics were very specific about numbers of particular operations or diagnosis and unfortunately, with the exceptions of poor mental health and drug problems, the qualitative evidence usually only highlighted poor health generally as precursor to homelessness. It was therefore difficult to identify what would be relevant data sets for the purposes of this research. A decision was made to include two general measures of poor mental health – number of mental illness admissions to and discharges from hospital. These more general statistics were therefore sourced from the census 2001 once again. Key statistics table KS21 – Households with limiting long-term illness and dependent children, as well as KS08 - Health and provision of unpaid care were other tables utilised as a source for potential indicators under this heading.

4.2.6.4 Ethnicity

Table KS06 of the Census 2001 Key Statistics for Local Authorities in England and Wales was used as the source of data for ethnicity. However, the evidence to support inclusion of ethnicity was not as specific as the breakdown provided by the census data, for example, the table provided a detailed breakdown of four categories of Asian ethnicity but the qualitative evidence available for ethnicity only referred to Asian generally. The census statistics were therefore amalgamated to provide data on more general categories of ethnicity, namely

White, Mixed Race, Asian and Black. Although the table also provided data for numbers of Chinese or other ethnic group in the population, there was no support in the literature to include these groups and they were therefore omitted. The table provided the breakdown of figures as percentages. Given the small fractions of a percent that were involved in some Local Authority areas it was decided that actual numbers would be more meaningful for analysis and the data was therefore transformed based on the figures for 'all people' contained in the table. It was felt that this table provided sufficiently adequate data for this category and so no further statistics were sourced for this issue.

4.2.6.5 Poverty

The Department for Work and Pensions (previously the Department of Social Security) at www.dwp.gov.uk provided possible data on benefit payments. These were actually accessed through the Census 2001 data but the data came with a warning that the information was based on administrative data and did not comply fully with the National Statistics Code of Practice. Although this was obviously a concern it was felt that the data was the best that was available and for the purposes of this research would be an adequate reflection of the levels of poverty in the Local Authority areas. It was decided to use total figures for the number of Income Support (IS) claimants in the areas and the number of people claiming Job Seekers Allowance (Income Based) (JSAIB). These benefits are means tested and have a very low threshold for exclusion from benefit. This threshold is set annually by Central Government and is essentially set at the minimum income required for basic subsistence. Income support is paid to those who are unable to work and who are not eligible for other private or state assistance (for example due to ill health or disability) – essentially, it is the final safety net for those with little or no source of income and is designed to ensure that everyone has at least a minimum level of income to cover the essentials of life. The benefit support quickly tapers to nothing after the minimum income levels are reached. JSAIB is basically set at the same level as income support and serves the same purpose. It is paid to those who are able to work provided that they are actively seeking employment. These two benefits are not dependent on the amount of national insurance contributions paid and they are mutually exclusive – all other things being equal, you get one if you are able to work and the other one if you are unable to work and you only get either if you have little or no savings and your household income is little or nothing. In the circumstances, it was felt that these figures would include the majority of people on a very low income and consequently that these figures could provide a reasonable reflection of the level of individual poverty in the area. The numbers of people of working age who had never worked or who were long term unemployed were also included as a possible indicator of the poverty within a Local Authority area as were the numbers of people of working age who were economically inactive.

4.2.6.6 Relationship breakdown

One of the most obvious indicators for this category was considered to be the number of divorces occurring within a particular area during a year. However, this information was only available at family court level, not Local Authority level. The census did however provide a breakdown of marital status at the time of the census; table KS03 – Living Arrangements, provided numbers of separated, divorced and widowed people aged 16 and over in households. These figures were therefore used in the preliminary analysis. It is recognised that these indicators only point to relationship breakdown between traditional "husband and wife" relationships and do not include relationship breakdown between other family members such as young people and parents or the breakdown of sibling support. There is undoubtedly some overlap here with other categories such as sex and age as well as deinstitutionalisation below and some attempt has been made to cover these issues under different headings. However, it is nevertheless acknowledged that the potential variables included under this heading are not comprehensive indicators of the subject area. In an attempt to incorporate the issue of a belief in a god into the analysis, numbers of people with no religion, from table KS07 – religion, were also included in the preliminary analysis. Although the theoretical evidence highlighted that a relationship with a god was considered to be a relevant factor, as detailed in **2.6** above, the evidence to support the link between homelessness and belief in a god was fairly limited and certainly much less evidenced than some of the other categories under investigation. This indicator was included partly in an attempt to widen the coverage of this category beyond the traditional perception of relationship breakdown.

4.2.6.7 Sex and age

The issues around sex as an indicator for homelessness were very difficult to quantify. Beyond the obvious number of males and females in an area, there were very few statistics available on the issue of the balance of control and economic power between men and women in a relationship. This concept is not only a nebulous one but it is highly subjective and seemingly impossible to quantify in terms of statistics. A search was made of the Child Support Agency at www.csa.gov.uk but revealed no suitable statistics. This would, in any event, have excluded all those families who are not within the Child Support Agency catchment as well as all childless couples and would not therefore have been a very useful or valid indicator. Further, it is not simply a matter of who holds the economic power and the impact of this on security and stability in terms of housing but also about the emotional challenges that the dynamics of a relationship can bring for both males and females and how they can affect a person's ability to cope with the practicalities of life. Without availability of, and access to, detailed psychological measures across the population, these issues are simply not quantifiable and consequently no data beyond numbers of men and women was included for the issue of sex.

Age was easier to address although still not without its problems. The issues of low income amongst the young, partly due to a lack of qualifications and experience as well as the number of teenage pregnancies are all quantifiable to some extent. Again the statistics utilised were sourced from the Office for National Statistics site. In particular, the Census Area Statistics for numbers of young people claiming subsistence level benefits, Key Statistics KS02 for numbers of 16 and 17 year olds living in the area at the time of the 2001 census and Census Area Statistics UV24 for details of numbers of people without qualifications. It was decided to include data on numbers of young people claiming either income support (due to being unable to work for whatever reason) or income based Job Seekers Allowance (for those that are actively seeking work) in the hope that, as these benefits are mutually exclusive, the large majority of young people living on subsistence level benefits would be captured in the data. It is recognised that numbers of people without qualifications will include people of all ages but it was felt that this data arguably highlighted levels of poor formal education in the area. As poor educational standards have been shown to be a contributory factor for homelessness it was felt that such an indicator should be included somewhere in the research. As a lack of education and qualifications is often cited as a barrier particularly affecting young people it was decided to place this indicator under the category of sex and age. It was also decided to include the number of under 18 conceptions as a possible variable under this category and this data was obtained from www.statistics.gov.uk – conceptions statistics.

4.2.6.8 Drug abuse

The fact that drug use is stigmatised and in the case of illicit drug use, illegal, meant that comprehensive, reliable figures on use might be hard if not impossible to find. Eventually, some useable statistics were obtained from the NHS National Treatment Agency for Substance Misuse (NHS NTA) at www.nta.nhs.uk/areas/fact_and_figures/0304/default.aspx. These statistics provided details of the main drug of misuse of individuals in contact with structured drug treatment agencies by drug action team of area of residence. The data was available at County level. To maintain anonymity and confidentiality for their clients, any counts less than or including 4 were suppressed. For the purposes of this research it was considered that recording such circumstances as missing could potentially bias the results and consequently an arbitrary value of 3 was inserted whenever suppression occurred. In the data provided by the NHS NTA, data for the Isles of Scilly was included with the figures for Cornwall. For the purposes of this research, as it was not possible to obtain a more detailed breakdown, this information was used for Cornwall and data was listed as missing for the Isles of Scilly. It should be noted however that the statistics used under this heading only reflect those individuals in contact with the NHS NTA. Whilst this is likely to include those drug users actively seeking help with their behaviour as well as those individuals who have become known to the agency as a result of criminal behaviour, there is no way of knowing what proportion of drug users these figures represent and the prevalence of drug use in any particular area could therefore be much higher than the data suggests.

4.2.6.9 Deinstitutionalisation

The evidence for this issue points to different groups experiencing deinstitutionalisation; those leaving the care system, those leaving prison, those leaving mental health institutions and those leaving the armed forces. The sources for statistics for each of these groups are obviously different and the following avenues were explored:

4.2.6.9.1 Leaving Social Services care

Statistics on the numbers of care leavers were sourced from www.dfes.gov.uk (Department for Education and Skills) and www.dcsf.go.uk (Department for Children, Schools and Families). The first of these websites provided statistics at county level for numbers of young people leaving care from 2000 to 2004 as well as details of children ceasing to be looked after. To maintain confidentiality and anonymity for their clients, these figures were provided already rounded up or down to the nearest 5 count and have consequently been included in this format. Figures for the total children in need and receiving services from their local Social Services department were also obtained from www.dh.gov.uk/PublicationsAndStatistics/Statistics/StatisticalWorkAreas/ but these statistics were again only available at the county or unitary authority level.

4.2.6.9.2 Leaving prison

For statistics on prison discharges – despite extensive searching on the Home Office website www.homeoffice.gov.uk and more recently www.justice.gov.uk - relevant statistics on prison discharges were not available for Local Authority areas. Discharge statistics were available at www.homeoffice.gov.uk/rds/pdfs/ for individual institutions and were collated for the country as a whole but geographical breakdown or analysis was notably absent. It was not therefore practical to include an indicator representing prison discharges in the modelling process. This was considered a key area to include in the research and alternative options for data were therefore required. As an alternative, the crime statistics for Local Authority areas were considered. This was based on the hypotheses that the number of prison sentences would be linked to convictions and that shorter prison terms were often particularly problematic with regard to homelessness. Statistics were therefore included for seemingly less serious crimes which would be likely to carry shorter sentences. These statistics were sourced from the Office for National Statistics; Census 2001; Census Area Statistics.

4.2.6.9.3 Leaving mental health care

For statistics on mental health discharges only two primary sources were identified and accessed: The first source was the Department of Health at www.dh.gov.uk/PublicationsAndStatistics/Statistics/StatisticalWorkAreas/Statistics for details on the number of cases of guardianship under the Mental Health

Act 1983, the primary legislation governing the care of people with mental health difficulties. This data was only available at County and Unitary authority level. The second source was the Office for National Statistics, Census 2001, Census Area Statistics for the numbers of mental illness admissions and discharges across the Country. This data was only available at PCT level.

4.2.6.9.4 Leaving the armed forces

For statistics on discharges from the armed forces, the site for the Ministry of Defence www.mod.uk was searched extensively. Whilst detailed figures were found for medical discharges, comprehensive figures for all discharges across all the service areas were not found. The Audit Commission at www.nao.org.uk/publications did provide some general summary detail on discharges but the numbers were not specific enough to be included in this research and, once again, were not available at either local authority, county or even regional level. It was not therefore possible to include an indicator which obviously represented armed forces discharges. Statistics were however available for the number of all armed forced personnel living in Local Authority areas in the census area statistics (table UV81). It was felt that the number of forces discharges in a particular area may be proportionate to the number of forces personnel living in the area and this data was therefore included rather than have this category unrepresented.

4.2.6.10 Migration

The Census 2001 Key Statistics for Local Authorities in England and Wales was able to provide appropriate statistics for this category in tables KS24 and UV23. There were a number of possible indicators to choose from, including a breakdown of migration by ethnic group. Again, it was felt that such detail was not appropriate for the purposes of this research and that the issue of ethnicity would be covered separately within the exploratory process, so the more general figures for movement of 'all people' were used. It was felt that the research should include a general indicator to represent whether the population of an area had decreased or increased over a period of time. The research also included indicators that detailed net in-migration as well as movement within the area because it was felt that movement within an area might be an indicator of levels of housing insecurity within a particular district.

4.2.7 Summary of data to be used

The data analysis therefore started with a total of 69 independent variables which are referred to as predictor variables. The complete list together with source details is detailed in Appendix 2. This figure includes a number of duplicated variables measuring the same thing but at different periods of time. All of the independent variables are interval variables except for one variable (council type), which is a nominal variable. There were also 45 potentially dependent variables referred to as outcome variables, again detailed in Appendix 2. The outcome variables are the same measure, P1E figures, at different points in time. The intention was that both sets of variables would be significantly reduced as the analysis progressed towards a potential model. Whilst it is acknowledged that the variables termed predictor variables are not necessarily predictors of what have been termed the outcome variables, these phrases have been used simply as a means of differentiating between the two sets of variables during the early stages of data analysis.

The outcome variables are the official quarterly and annual Local Authority figures on the numbers of decisions made on homeless applications as well as the number of decisions that resulted in the full statutory duty being due to the applicants from 2000 to 2004. The predictor variables are the sets of statistics available at a local level grouped in to subject areas that have been shown as being possible precursors to homelessness – the subject areas being; housing, poor health, ethnicity, poverty and debt, relationship breakdown, sex and age, drug abuse, deinstitutionalisation, migration figures and some general Local Authority details. A summary table detailing the subject area, the indicators selected and the code allocated to each one is provided over page for ease of reference. This information is also available in abbreviated form on a look-up card which can be found on the inside, back cover of this report. Indicators that are considered as count data are coloured green and percentages are shown in purple.

Concept		Indicator	Code
general demographics		Size in hectares as at 21st April 2001	gen1
		Total population as at 21st April 2001	gen2
		number of males as at 21st April 2001	gen3
		number of females as at 21st April 2001	gen4
		Council type	gen5
		2001 Density (number of people per hectare) as at 21st April 2001	gen6
Migration		% intercensal population change (1991-2001)	migration1
		Lived elsewhere outside the area but within the associated area within the last year (2001)	migration2
		Lived elsewhere outside the area but within the UK within the last year (2001)	migration3
Deinstitutionalisation	leaving armed forces	All armed forces persons (living in households or communal establishments in the area) as at 21st April 2001	deinst1
	leaving social services care	children in need receiving services in 2000 (during a typical week in february 2000)	deinst2
		children in need receiving services in 2001(during a typical week in sept/oct 2001)	deinst3
		Children ceasing to be looked after during the year ending 31st March 2000	deinst4
		Children ceasing to be looked after during the year ending 31st March 2001	deinst5
		young people who ceased to be looked after during year ending 31/3/2000	deinst6
		young people who ceased to be looked after during year ending 31/3/2001	deinst7
		young people who ceased to be looked after during year ending 31/3/2002	deinst8
		young people who ceased to be looked after during year ending 31/3/2003	deinst9
		young people who ceased to be looked after during year ending 31/3/2004	deinst10
	leaving mental health care	Guardianship under the Mental Health Act 1983 - cases closed during year ending 31/3/2000	deinst11
		Guardianship under the Mental Health Act 1983 - cases open as at 31/3/2000	deinst12
		Guardianship under the Mental Health Act 1983 - cases closed during year ending 31/3/2001	deinst13
		Guardianship under the Mental Health Act 1983 - cases open as at 31/3/2001	deinst14
	leaving prison	Violence against the person - notifiable offences recorded by the police April 2000-March 2001	deinst15
		Burglary from a dwelling - notifiable offences recorded by the police April 2000-March 2001	deinst16
		Theft of a motor vehicle - notifiable offences recorded by the police April 2000 - March 2001	deinst17
		Theft from a motor vehicle - notifiable offences recorded by the police April 2000- March 2001	deinst18
Ethnicity		white population (amalgamated) as at 21st April 2001	ethnicity1
		mixed race population (almagamated) as at 21st April 2001	ethnicity2
		asian population (amalgamated) as at 21st April 2001	ethnicity3
		black population (amalgamated) as at 21st April 2001	ethnicity4
		total non-white population (amalgamated) as at 21st April 2001	ethnicity5

Table 4.1 Detailing predictor variable concepts, indicators and codes

Concept	Indicator	Code
Sex and age	Number of 16 and 17 year olds as at 21st April 2001	sexage1
	Number of people with no qualifications as at 21st April 2001	sexage2
	Number of under 18 conceptions 1998-2000	sexage3
	Number of under 18 conceptions 2001-2003	sexage4
	Number of Income Support claimants under 20 as at August 2000	sexage5
	Number of Income Support claimants under 20 as at August 2001	sexage6
	Number of Income based Job Seekers Allowance Claimants under 20 as at August 2000	sexage7
	Number of Income based Job Seekers Allowance Claimants under 20 as at August 2001	sexage8
Housing	Social Housing Rents - mean of all dwellings gross rent as at 31st March 2002	housing1
	Social Housing Rents - mean of one bedroom, RSL gross rent as at 31st March 2002	housing2
	Social Housing Rents - mean of three bedrooms, RSL gross rent as at 31st March 2002	housing3
	average price of semi-detached property 2000	housing4
	average price of semi-detached property 2001	housing5
	average price of a flat 2000	housing6
	average price of a flat 2001	housing7
	average residential property price 2000	housing8
	average residential property price 2001	housing9
Relationship breakdown	Separated (but still legally married) as at 21st April 2001	relationship1
	Divorced as at 21st April 2001	relationship2
	widowed as at 21st April 2001	relationship3
	Total relationship breakdowns (separated + divorced + widowed) as at 21st April 2001	relationship4
	No of people with no religion as at 21st April 2001	relationship5
Poverty	Total number of Income Support claimants as at August 2000	poverty1
	Total number of Income Support claimants as at August 2001	poverty2
	Total number of claimants for Income based Job Seekers Allowance as at August 2000	poverty3
	Total number of claimants for Income based Job Seekers Allowance as at August 2001	poverty4
	Number of people aged 16-74 who have never worked or who are long term unemployed (amalgamated)	poverty5
	Number of people aged 16-74 who are economically inactive (amalgamated) as at 21st April 2001	poverty6
Poor health	Number of people with limiting long term illness as at 21st April 2001	poorhealth1
	Total mental illness admissions April 2002-March 2003	poorhealth2
	Total mental illness discharges April 2002 - March 2003	poorhealth3
Drug abuse	number of people in contact with drug treatment agency 2003/4 using heroin as their main drug	drugs1
	number of people in contact with drug treatment agency 2003/4 using methadone as their main drug	drugs2
	number of people in contact with drug treatment agency 2003/4 using amphetamine as their main drug	drugs3
	number of people in contact with drug treatment agency 2003/4 using crack as their main drug	drugs4
	number of people in contact with drug treatment agency 2003/4 using cannabis as their main drug	drugs5
	total number of people in contact with drug treatment agency 2003/4 using any drug as their main drug	drugs6

Table 4.1 Detailing predictor variable concepts, indicators and codes

4.2.8 Reliability and validity

It is obviously of importance that these measures are both reliable and valid. All of the measures included are from credible sources and therefore, prima facie, have both validity and reliability in relation to the issue they are designed to measure. However, it is widely recognised that statistics are a product of their context (Dorling & Simpson, 1999) and will therefore bring with them concerns over their politicisation, reliability and validity. The shortfalls of the official statistics for homelessness have already been highlighted (see **3.3.1.2** earlier) and similar validity issues will exist with the data for each of the independent variables considered. Problems of undercounting and overcounting are widespread and categories within data can be restrictive, exclusive or inappropriate, resulting in misleading statistics (Ginn, 1999; Bartley, Blane & Smith, 1999; Miles, 1999). Whilst steps are often taken to mitigate undercounting, there is usually an assumption made that those missed from enquiries are the same as those who are not missed (Diamond, 1999). For groups such as homeless people this assumption is often misplaced. It is recognised that there will always be uncertainty within statistics and consequently, they can never reveal the precise truth on an issue (Cornford, 1999). However whilst there are such obvious limitations with official statistics, they are usually the only indicators available for statistical analysis of social issues and are therefore used in this research with the caveat that their limitations are acknowledged.

A further concern for this research is that whilst the measures used may be credible in themselves, they are used here as indicators of wider concepts for which their credibility has not been tested or proved. The measures were initially chosen due to their face validity. That is they appeared to measure the concepts highlighted to some extent, although the author is not suggesting they are in any way a comprehensive representation of the whole concept. Whether they actually do measure the concepts, is not only debateable and outside the scope of this research report but also arguably less important than the issue of whether the measures themselves are predictive indicators of homelessness. Although the measures have been put under the various concept headings, the categories themselves are generally wide in their definition and are only intended to provide a loose structure from which to start the analysis.

Whether the measures have predictive validity, namely whether the measure holds true in the future is another concern. By the inclusion of the same measure covering different time periods (e.g. looking at the P1E figures for numerous time periods, as well as including at least one other time period for 16 of the predictor variables) it is hoped that this issue can be checked and predictive validity demonstrated where possible. By including the nominal variable of Council type as well as the general variables of geographical size and population size, it was hoped that the issue of concurrent validity could be checked to compare how effectively the measures measured the concept for the different types and sizes of councils. The intention was to use these various approaches to establish convergent reliability.

The level of external reliability of the measures was demonstrated by considering the consistency of the various variables over time. Test-retest reliability is one of the main ways of checking external reliability so if the same variables provided different results over time they were considered as externally unreliable and excluded from further analysis and modelling.

Internal reliability raises the question of whether each measure used is measuring a single idea and hence whether the items that make up the category are internally consistent. Internal reliability of the measures was checked using SPSS and the Cronbach's alpha test. This test was used to affirm whether or not the indicators selected to represent each category actually seemed to be measuring the same underlying concept. If the result for Cronbach's alpha was high within each category it was considered a good gauge that the various indicators were representative of the categories to which they had been allocated. Cronbach's alpha is loosely equivalent to splitting the data in two in every possible way, computing the correlation coefficient for each split and then working out the average of these values (Field, 2005). The equation for Cronbach's alpha is

$$\alpha = \frac{N^2 \overline{Cov}}{\Sigma\, s_{item}^2 + \Sigma\, Cov_{item}}$$

The top half of the equation is the number of items squared multiplied by the average covariance of the items. The bottom half of the equation is the sum of all the item variances and item covariances. Cronbach's alpha test was used rather than the split-half reliability test as it overcomes the problem that can arise using the split-half reliability test; namely that the results could be a product of the way in which the data were spilt. Provided the correlation coefficient generated was greater than 0.8 the measure was considered as internally reliable and continued to the next stage of the analysis (Kline, 1999). If the internal reliability score of a measure proved to be low and there were no acceptable alternatives for inclusion under a particular category the author would have considered removing the outliers and any Council that had results on the extremities of the measure in order to establish whether reliability could be boosted however this proved to be unnecessary.

4.2.9 Methods - overview

As stated earlier, before any analysis could be carried out all of the data was inputted to an excel worksheet and than transferred to SPSS. There were three master files for SPSS; one for data at Local Authority level, one for data at County level and one for data at PCT level. All the variables were coded for ease of use in SPSS. The master list of all the variables initially identified for possible analysis, detailing their codes and data source, is listed in Appendix 2. All missing values for all variables were allocated a value of -99 for the purposes of analysis using SPSS.

It was decided to take a bottom-up approach to the exploratory analysis. Initially looking at the characteristics of all the individual variables highlighted at all levels of administrative grouping (local authority, county and PCT) in order to assess whether they were appropriate for use with robust statistical testing (essentially, whether they met the assumptions for parametric tests - the assumptions being normally distributed data, homogeneity of variance, whether the data was interval data and whether the results from the different councils were independent from each other) and if not, whether they could still potentially be useful as the analysis progressed.

Statistical tests were not available to check the assumptions of interval data and independence, however, common sense identified that the data was interval in nature and independence of the various councils simply has to be assumed although this issue is briefly discussed further in the next chapter. Assessing the first two assumptions of parametric tests involved producing and considering a large amount of data as detailed below under the heading of univariate analysis. Bivariate analysis was then carried out between the outcome variables and the predictor variables, again at all levels of administrative grouping with the intent to identify those outcome and predictor variables that could be most useful in the multivariate stage of the analysis. The bivariate procedures used are detailed below under the heading bivariate analysis. Bivariate analysis reduced the number of potential variables to a level which made multivariate analysis and exploratory modelling more possible. Regression analysis was the primary method used in the multivariate analysis, complimented with the use of factor analysis to address the concerns of collinearity. Further details and rationale for using particular methods at different stages of the analysis are provided below.

4.2.10 Univariate analysis

4.2.10.1 Distribution

Initially basic exploratory univariate analysis was carried out on all variables, primarily for the purposes of familiarisation with the data and to assess whether parametric or non-parametric testing would be most appropriate. The initial univariate analysis looked at dispersion and distribution of the data. Once this had been undertaken, Kolmogorov- Smirnov one sample figures were produced (rather than Shapiro-Wilks due to the large sample size) to determine whether or not there was a significant deviation from the normal distribution. Box-plots and Q-Q plots were also produced for all variables to enable checking for outliers and extremes.

4.2.10.2 Reliability

In addition to the basic information on frequencies and distribution, Cronbach's alpha test was carried out (using the split-file method) as a measure of the reliability of the various measures considered (see 4.2.8 above for more details). The outcome variables were grouped in sets for each year of the data, and the other variables in sets of their category headings (e.g. housing, sexage, relationship etc). The results of these actions are detailed in **Figure 10**.

4.2.10.3 Grouping

To check for possible subgroups of normal distribution within the data, an analysis was run for the different types of councils and the different sizes (measured both in terms of total population in the area and geographical size of area covered). Spiker (2004) recommends a minimum of six categories. When recoding for the grouping council types it was decided to divide the councils into self-defined groups of council type; i.e. district, borough, city, unitary, metropolitan, Inner and Outer London. Whilst it is acknowledged that there are very few, if any differentiating factors between some of these council types, e.g. district and borough, there are perceptible differences between some of the council types, e.g. metropolitan and district councils. Additionally, from a consumer perspective, it was felt that councils would potentially be more open to accepting and using the findings of this research if they could relate to and connect with the grouping categories. Finally, the number of categories resulting from defining the groups in this way conveniently satisfied Spiker's recommendation.

For the grouping of geographical size and population size, both of the variables were interval. The range for each of the variables was therefore determined and then divided into five discrete categories of equal width. It was necessary to recode the variables geographical size (gen1) and population size (gen2), producing new variables gen1gp and gen2gp. The groups for size in hectares were group 1:1000 to 41000, group 2: 41001 to 81000, group 3: 81001 to 121000, group 4: 121001 to 161000 and group 5: 161001 through to the highest figure. The groups for population size were group 1: 1 to 100000, group 2: 100001 to 200000, group 3: 200001 to 300000, group 4: 300001 to 400000 and group 5: 400001 through to the highest figure. Although a minimum of six categories is generally recommended for recoding (Spiker, 2004), due to the distribution of the data and the need to maintain equal widths for categories, five groups for each new variable were considered more appropriate and assisted with decisions regarding whether the majority of the groups were normally distributed (see below at **4.2.10.4**).

4.2.10.4 Group distribution

Frequencies and distributions based on each of the subgroups (Council type, size and population) were then run for all variables to check for normal distribution that may otherwise have been hidden. If the histograms and QQ plots produced for the different groups showed a normal distribution for the majority of the sub-groups, Kolmogorov-Smirnov testing was applied to each group to assess whether there was a significant deviation from the norm for that group. If Kolmogorov-Smirnov figures showed no significant deviation from the norm for the majority of the sub-groups, the number of cases that *did* significantly deviate from the norm was assessed to see how inclusive the normally distributed groups were. If more than half of the cases fell into groups that demonstrated normal distribution the variable was considered as essentially normally distributed and therefore potentially appropriate for parametric testing. A summary of these assessments is included in the next chapter and the results are discussed.

4.2.10.5 Parametric testing

Parametric tests would only be used for those variables that proved, among other things, to be normally distributed. As detailed above, these were identified by various stages of testing. Firstly normal distribution was assessed for all variables at all levels (Local Authority, County and PCT) as detailed above. If the distribution appeared normal from the visual representation of histograms, QQ plots and stem and leaf diagrams, figures for skew, kurtosis and Kolmogorov-Smirnov tests were checked. If these assessments confirmed normal distribution the variables were considered as possibly appropriate for parametric testing. As discussed in the following chapter, initial analysis highlighted that all of the outcome variables and a large number of the predictor variables failed to satisfy the requirement for normal distribution. If this issue proved to be insurmountable, parametric testing would not be possible on the data. The possibility of transforming the data to address this issue was therefore considered as a next step.

4.2.10.6 Transformation of data

All three standard methods of transformation were considered; square root transformation, reciprocal transformation and log transformation. The reciprocal method was discounted as it was felt that this could generate misleading results further on in the analysis due to the fact that this method reverses the scores: large scores become small and small scores become large. As demonstrated in the following chapter, the log transformation produced the most effective results of normalising the data due to positive skew being the main problem and the fact that all data was positive with very few zeros. Transformation was undertaken using SPSS. The new variables were labelled with a prefix of "log". As some of the data (albeit a minority) contained zeros, and a logarithmic transformation was being calculated, a constant of 1 was added to the original variable in calculation of the new variable [e.g. **Lg10(T2d+1)**]. The new variables were calculated to six decimal places to maintain a high degree of detail within the data. After log transformation, all of the outcome variables at all levels demonstrated a normal distribution. The predictor variables that initially failed to demonstrate normal distribution were also transformed using logarithmic transformation and the same assessment procedures as detailed above. This process led to the large majority of variables eventually satisfying the requirement of normal distribution. Square root transformation was investigated for the variables that failed to demonstrate normal distribution initially or via log transformation. The variables that still failed to demonstrate a normal distribution after transformation attempts were considered as inappropriate for use with parametric tests and further analysis involving these variables would therefore be limited to non-parametric testing.

4.2.10.7 Analysis of variance

It was problematic to run the usual analysis of variance on the independent variables as the variables measured very different things and clearly had wide deviations in their means and standard deviations. Homogeneity of variance between the subgroups of the data was therefore checked, using Levene's test. SPSS was used for the Levene's test. It was not practical at this time to check for homogeneity of variance for the variables at County level and PCT level as the data were not grouped. Although transformation would have made checking for homogeneity of variance using ANOVA more possible, the quantity of potential dependent and independent variables available to the research at this stage of the process would have caused serious concern that type 1 (experiment-wise) errors could be apparent even with Bonferroni's correction. It was therefore decided to postpone checks for homogeneity of variance until a later stage of the analysis when the variables had been 'weeded out'. The thinking being that if multiple regression techniques yielded a potential model for predicting homelessness levels, post hoc testing of the assumptions and the residuals could be undertaken. If the assumptions were not met at this later stage of the research, it would still be possible to use Kruskal Wallis (the non-parametric counterpart of ANOVA) for testing the remaining variables.

4.2.11 Bivariate analysis

After determining which variables were suitable for parametric testing, bivariate analysis was carried out on all variables using SPSS. Analysis was carried out with the awareness that the large sample size could produce statistically significant results even with a very small effect and that statistical significance would not necessarily correspond with practical value or interest. The purpose of this next stage of the research was to assess whether any of the predictor variables showed a linear relationship with the outcome variables and to see if relationships were stronger at different points in time. Initially, as before, a visual assessment of any relationships between the predictor and outcome variables was made. Then statistical tests were carried out to support or discredit those relationships.

4.2.11.1 Distribution

Initially scatter plots were generated for all predictor variables against all outcome variables for original data. This was done using SPSS. The data were also grouped by council type using colour differentiation. These plots were checked for linear and non-linear relationships. This process identified where relationships were most evident and highlighted those predictor variables that did not show any signs of a relationship with the outcome variables. Any variables that showed no signs of a relationship in the scatter diagrams were excluded from the next stage of the data analysis. Bivariate correlation statistics were then generated. Pearson's correlation co-efficient was calculated for the data that satisfied the assumptions for parametric testing. This meant using a combination of original variables and transformed variables in the calculations. A one-tailed test with a level of significance assessment of 0.05 was possible as the direction of the hypothesis for each of the predictor variables was expected to be positive on each occasion; an increase in any of the predictor variables was expected to correspond with an increase in the number of homeless decisions. There was only one variable, poorhealth2 (mental health admissions) at PCT level, that might have required a two-tailed test due to a non-directional hypothesis but the scatterplot clarified that the relationship was in fact a positive linear one.

4.2.11.2 Issue of time lag

As detailed above, correlation coefficients were run for all predictor variables that demonstrated an association with the outcome variables. The key reason for doing this was to try to identify whether the level of correlation of predictor variables against the outcome variables varied over time. The thinking behind this was that there might be a period of time between experiencing the situation portrayed by the predictor variable and needing assistance with homelessness. Leaving care is a good example of this; when an individual is discharged from the care system, they would usually be placed in some form of accommodation. It might be a while before difficulties arise with sustaining this accommodation – for example, housing benefit may not need to be renewed until twelve months after the individual has been discharged from the care system. However, when it does need to be renewed, forms will need to be completed by the individual and if they are unable to complete this process successfully without the support of a social worker which they may have had in the past, it could quickly lead to rent arrears, eviction proceedings and ultimately to homelessness. There could therefore easily be a time lag of two years between being discharged from care and becoming homeless but nevertheless in this scenario, the two situations are linked and this link could be missed if the predictor variable was just considered against homelessness decisions for the same time periods. Research by O'Flaherty provides support for this idea, of a delay in effect, suggesting that macroeconomic conditions affect levels of homelessness with a time lag (O'Flaherty, 2006). Correlation statistics were therefore plotted on graphs against the outcome variables in order to try to identify any trends over time in the correlation, any peaks or any obvious time lags between predictor variable data and the outcome variable data.

4.2.11.3 Collinearity

Before multiple regression analysis could be carried out on the remaining variables, it was necessary to check that the assumptions of such analysis would be satisfied. The issues of collinearity and multicollinearity were a particular concern as variables within particular categories would, by definition, be likely to correlate with each other. Further, it was anticipated that there may be some correlation between variables in different categories, for example, between poor health indicators and deinstitutionalisation indicators for leaving mental health care. Bivariate correlation analysis between the predictor variables was therefore undertaken to check for significant collinearity. Initially, any correlation coefficient of more than 0.9 within the correlation matrix was considered as indicating multicollinearity and therefore requiring further consideration before multiple regression analysis could be carried out. High levels of collinearity between predictor variables lead to unstable predictor equations and increase the probability that a good predictor of the outcome will be found non-significant and rejected from the model (a Type II error) (Field, 2005). Obvious collinearity between variables is considered to be a correlation of above 0.9 or 0.8 (Field, 2005). For the purposes of this research a value mid-way between these figures was chosen with correlations of above 0.85 considered as showing that collinearity. Several of the categories demonstrated this high level of correlation between variables. There was also a degree of collinearity between categories and these issues are discussed below. Whilst this was not unexpected, it led to the need to decide which, if any, of the variables within a category, could or should be included in the model.

4.2.11.4 The possibility of using factor analysis to reduce the number of variables within each category

Where there were a number of variables in a category that all correlated highly with the outcome variables, the use of factor analysis, or rather principal component analysis, was considered with a view to eliminating the multicollinearity and reducing the number of variables for multivariate analysis. Factor analysis derives a mathematical model from which factors are estimated and consequently relies on assumptions for these estimates to be accurate. Principal component analysis simply decomposes the data into a set of linear variates (Dunteman, 1989) and is only concerned with establishing which linear components exist and how a particular variable might contribute to that component (Field, 2005). The existence of groups of large correlation coefficients between subsets of variables suggests that those variables might be measuring aspects of the same underlying dimension (Field, 2005). To some extent, this is a reassuring finding in this research, suggesting that the potential variables identified for each category do seem to indicate the same underlying concept (e.g. poverty). However, this high correlation between variables was in itself a problem when considering the use of factor analysis as extreme multicollinearity causes problems in factor analysis. Essentially, it becomes impossible to determine the unique contribution to a factor of the variables that are highly correlated and exclusion of variables that correlate very highly ($r>0.9$) with other variables is recommended before factor analysis is undertaken (Field, 2005). In this research, exclusion of variables in this manner would almost alleviate the need for any factor analysis to be carried out and could potentially exclude whole categories of predictor variables that correlated highly with the outcome variables but also were highly correlated with each other (for example, deinstitutionalisation; leaving prison). However, this principle of excluding highly inter-correlated predictor variables was adopted in part where appropriate.

Another issue was the potential reliability of factor loadings. Given that the number of variables in each category had been reduced by this stage to a maximum of four, there could only be a maximum of four variables contributing to any particular factor that emerged. Guadagnoli & Velicer (1988) argue that a factor needs to have four or more loadings greater than 0.6 to be reliable regardless of sample size and that factors with only a few low loadings should not be interpreted unless the sample size is three hundred or more. Therefore in this case, the sample size and the number of remaining predictor variables, particularly at county and PCT level, would potentially make this analysis unstable and unreliable (Guadagnoli & Velicer, 1988). A further concern was that factor analysis requires that variables are normally distributed and the majority of the predictor variables did not meet the assumptions of normal distribution. It would therefore be necessary to undertake any principal component analysis on the transformed data and it was questionable as to whether such analysis would produce meaningful results. For these reasons it was decided not to undertake factor analysis on the data at this stage.

It was intended that the selection criteria for deciding which variables should remain in the analysis would be based primarily on the principle of taxonomy;

using the variable that would include the majority of other variables as subsets. This was not however always the best policy as, occasionally, a variable encompassed a number of the other variables which demonstrated no relationship with the outcome variables. Consequently, working with such a variable instead of a more specific indicator served to weaken the correlation with the outcome variables. Another issue that was considered in the process of reducing the possible number of predictor variables was that of amalgamated variables. In some of the categories, variables were constructed from two or more original variables (e.g. total relationship breakdown was an amalgam of separated, divorced, and widowed). If these variables were competing for a place in the multivariate analysis with other non-amalgamated variables, all other things being equal, it was the amalgamated variable that was discarded in order to keep things as straightforward as possible. Abraham and Ledolter state that a forecaster should try building simple models, which are easy to understand, use and explain. An elaborate model may lead to more accurate forecasts but may be more costly and difficult to implement. Ockham's razor, also known as the principle of scientific parsimony, says that in a choice among competing models, other things being equal, the simplest is preferable. (Abraham and Ledolter, 1983). The principle states that entities must not be complicated beyond necessity and that an explanation of any phenomemon should make as few assumptions as possible. Swinburne (1997) supports this idea on the basis of logic stating that when results cannot be used to differentiate between various options, some criterion must be relied upon to determine which to use and it is logical to pick the simplest. This same principle of simplicity was adopted in relation to competing variables as well as the model in general. Issues of availability and accessibility to information, the strength of correlation to the outcome variables, as well as strength of supporting evidence within the literature were all matters that were also considered in deciding which of the variables were to be used in the multivariate analysis. Such practices reduced the number of possible predictor variables at Local Authority level to 8.

4.2.11.5 Partial correlation

Partial correlation analysis was carried out on each predictor variable that remained after the initial bivariate analysis to try to ascertain; (i) whether the relationship with the outcome variable was spurious, (ii) whether any of the remaining variables were intervening variables, (iii) whether any of the predictor variables could be considered a causal variable related to another predictor variable and (iv) the unique affect of each remaining predictor variable on the outcome variables full duty decisions and total decisions. SPSS was used, controlling for each of the variables against each other. The results of this analysis are discussed in the following chapter and reduced the number of possible predictor variables to 5 at Local Authority level.

4.2.11.6 External variables

It was necessary to consider whether predictor variables were correlated with any external variables that hadn't been included. It was important that external variables did not correlate with variables that were being included in the regression model which could influence the outcome variable. Otherwise, the model could potentially be unreliable and invalid as other variables could exist that could predict the outcome just as well or potentially better. Whilst attempts have been made to try to include data or indicators for all factors that the literature review highlighted as being associated with, or potential precursors to, homelessness, it is possible that data sets in other subject areas or other more appropriate indicators within the subject areas may have been missed. It is therefore impossible to guarantee that there is no correlation with external variables. However, it is hoped that by initially considering 69 variables across ten subject areas the wide coverage would minimise the possibility of missing something significant.

4.2.12 Multivariate analysis

In deciding how to move forward with multivariate analysis the author initially considered which methods had been used in the field to date, for what purpose and with what degree of success. Consideration was then given to how appropriate these methods were for the data and objectives in this research and finally, whether any alternative methods would be more appropriate for the task. Qualitative methods such as content analysis (Lee and Fielding, 2004) where categorized data is translated into nominal, ordinal or interval scales which can then be used to develop quantitative indices were briefly considered. Such an approach was rejected on the basis that it was unlikely to yield a reliable model that could be widely generalised for predicting homelessness across all local authorities in England.

The use of quantitative methods in this area has really been limited to looking for statistical relationships between variables (Craig & Hodson, 1998; Hudson, 1998; Scottish Executive Research Unit, 2001). Estimators have been used at a micro as well as a macro level. However at a micro level they have relied on extensive knowledge of individuals or of the population and at a macro level wide elasticities have limited their usefulness as a predictive tool (Ardilly & Le

Blanc, 2001; Aizen, 1991; Shinn et al, 1998) (see **3.3.6.2** earlier for more details). This was a concern for this research as wide elasticities in a model were likely to be particularly impractical for use at a Local Authority level. Further, past research has tended to focus on explaining and quantifying existing levels of homelessness and identifying historic trends and there have been very few constructive attempts to predict future levels.

The research that did seem to provide a sound base for moving forward with prediction used techniques of regression analysis, structural equation modelling and time series analysis (Craig & Hodson, 1998; Hudson, 1998; Scottish Executive Research Unit, 2001). Time series analysis was rejected for the purposes of this research due to part of the research being an investigation of the relationship between variables across points in time. Time series data can suppress crucial turning points in data (Issac & Griffin, 1989) and would therefore inhibit the intended exploration of the data. Structural equation modelling was also rejected. Whilst structural equation modelling is essentially a series of techniques based on the general linear model, conceptually, it is at the complex end of the spectrum and enables estimation of nonlinear models for categorical and latent variables (Ullman & Bentler, 2004). In this research, the variables remaining after bivariate analysis were discrete, interval variables that all demonstrated a linear relationship with the outcome variables. Structural equation modelling was therefore considered unnecessarily complex for the purposes of this research. The possibility of regression analysis was explored alongside other methods based on the general linear model and was considered the most appropriate method. Regression makes it possible to go beyond the data that is available; to predict one variable using data from one or more other variables. As this research was looking to provide a predictive tool, this was an essential requirement of the method. Regression provides a powerful methodology for estimating the distributions that variables would have under hypothetical conditions and is recognised as 'the commonplace of statistical analysis in the social sciences' (Stolzenberg, 2004: 165). Most importantly, this method was chosen as the purpose of this research was to provide a useable model for Local Authorities and regression analysis could potentially satisfy this requirement.

4.2.12.1 Number of predictor variables

After identifying the most appropriate variables for further analysis from the various predictor variables and the outcome variables, the plan was to undertake multiple regression in an attempt to build a model for levels of homelessness. However it was unclear whether the remaining number of significant predictor variables would be an appropriate number to provide meaningful or practically useful results in a regression model. Working on the basis of having a maximum of fifteen cases for each predictor variable included in the model (Field, 2005), the model should include no more than 23 predictor variables with the sample of 353 case at Local Authority level, no more than 9 or 10 predictor variables with the sample of 149 cases at county level and no more than 13 predictor variables with the sample of 199 cases at PCT level. To check the limit on the number of predictor values compared to the sample size reference was also made to Green's suggested rules of thumb, namely a minimum sample size of 50 + 8k where k is the number of predictor variables when considering the overall fit of any potential model, and 104 + k when considering the contribution of individual predictors, taking the stricter of the two formulas if considering both issues (Green, 1991). On this basis, for the sizes of the samples in this research, the maximum number of predictor values that could be included in the model would be 37 [(352-50) ÷ 8 = 37.875] for Local Authority level, 12 for county level [(149-50) ÷ 8 = 12.375] and 18 for PCT level [(199-50) ÷ 8 = 18.625)]. As these figures are higher than the general rule of number of cases for every predictor variable, it was decided to work with the lower limits. However, considering the charts produced by Miles and Shelvin (2001), with a sample size of 353, using the highest level of power (1.0), a medium or large effect on the outcome variables could still potentially be detected using up to twenty predictor variables. This maximum of 20 was still the case with the 149 cases in the database at county level. This guide of 20 predictor variables was therefore considered to be the absolute maximum that a model for this data could contain and ideally the number of predictor variables should be much smaller as using multiple indicators has disadvantages, the main one being that they are complex and may be too complex for easy digestion. (Spicker, 2004). It was therefore decided to aim for the lowest limit at any level, namely using a maximum of nine or ten predictor variables in the model.

4.2.12.2 Multiple regression

In any multiple regression the interpretation of any regression coefficient depends on the variables in the model. The predictors included and the way in which they are entered into a model can have a great impact on the model itself. Therefore inclusion of any variables in a regression model should be based on the substantive theoretical importance of these variables (Field, 2005). In this research all of the remaining variables had theoretical support.

However, as they were correlated with each other, the way in which they were entered into a potential model was an important consideration which could have had a significant effect on the model. Of the methods of entry available, forced entry and blockwise hierarchical entry were both used. The forced entry method forces all of the variables into the model simultaneously and therefore gives no consideration to the strength of support for inclusion of any particular variable over that of another. The blockwise hierarchical entry method allows the researcher to decide in which order to enter predictors into the model and therefore allows the importance of each individual variable to be considered. (Field, 2005). The option of using any of the stepwise methods was excluded. This was because in such methods, the decisions about which variables should be included will be made by the computer and based on slight differences in the semi-partial correlation between the variables. These slight mathematical differences may be very different from the theoretical importance of a predictor to the model. It was considered more important that the variables included in the model related to the qualitative evidence available. The variables were entered in three blocks; the first block containing variables representing people who should be considered as eligible for assistance under the homelessness provisions without debate, the second block containing those variables which might lead to assistance being given and finally, the third block of variables that would not, on their own, be sufficient to qualify for longer term help with housing. The regression was then run again using the forced entry option to check for any difference in output. The outcome variables 'total number of homelessness decisions for 2003 resulting in the full duty being owed' (T2003fd) and then 'total number of homelessness decisions made for 2003'

(T2003d) were used as the dependent variables in the analysis (as explained in **4.2.4** above).

The initial regression models (using the predictor variables remaining for multivariate analysis) were evaluated by using a number of assessment criteria and these are considered in turn in the next chapter. First and foremost, the value of R^2 was considered (see **5.3.1.1** below). This figure shows the amount of variation in the outcome variable that is accounted for by the model and is therefore a key indicator of the strength of the model. The analysis of variance was also assessed (see **5.3.1.2** below) and then the regression coefficients with their confidence intervals (see **5.3.1.3** below). These assessments led to an awareness of significant multicollinearity within the models.

4.2.12.3. Multicollinearity

Despite reduction of the variables, the initial regression analysis highlighted that there remained a problem with multicollinearity. This issue raised methodological issues both in terms of what methods should be used to move forward with the analysis and in terms of whether it was valid to try to construct a model at all. Linear regression by definition deals with linear issues. The collinearity suggests that there are non-linear issues that would not be adequately addressed with a linear model. Whilst collinearity flags up the limitation of the project methods, it also points to the complexity of the social world. The fact that there are high levels of correlation between the issues associated with homelessness is more than a methodological inconvenience. It supports the idea that homelessness may be just a label of convenience for a group of social difficulties in the complex social world.

Stolzenberg (2004) suggests four methods for dealing with collinearity: (i) To make use of computational algorithms that tolerate near-collinearity - this was already being done by using SPSS (version 13.0). (ii) To consider using ridge regression which is an empirical Bayes technique – this method does not always provide relief from collinearity and multicollinearity and the regression estimates are biased. The main purpose of the research was to try to produce a credible model that could be easily used and understood by non-mathematicians. It was felt that the use of such a technique would deviate from this purpose. (iii) To drop some of the variables – this had already been done. Finally, (iv) to look at combining similar variables into a new variable either by using simple additive functions or by factor analysis. It was not meaningful to combine the variables by adding them together so factor analysis was the only reasonable solution left open to try.

4.2.12.4 The use of factor analysis to manage high collinearity between variables in different categories

Factor analysis was carried out on the remaining five variables at Local Authority level in an attempt to overcome the problem of collinearity. The existence of clusters of large correlation coefficients between subsets of variables suggests that those variables could be measuring aspects of the same underlying dimension (a latent variable). Factor analysis reduces a data set from a group of interrelated variables into a smaller set of factors by explaining the maximum amount of common variance in a correlation matrix using the smallest number of explanatory concepts (Field, 2005) The analysis produced 'factor scores' for each council and these scores indicated the relative 'social disadvantage' of each Council compared to the rest of the sample (see **5.3.2** below for full explanation and discussion). There is considerable precedent and support for using factor analysis in social science research in order to identify or define underlying concepts that are hard to measure in their own right (e.g. Eysenck, 1953; Cattell, 1966, Townsend, 1979; Piachaud, 1987; Gordon et al, 2000) Reducing the number of interrelated variables by using factor analysis was therefore an acceptable solution to the issue of collinearity which was causing instability in the regression models and also satisfied the principle of scientific parsimony (see **5.3.6**. below for a full description of this principle).

All the variables included in the factor analysis were transformed variables and consequently satisfied the requirement for normal distribution and interval measurement. While mild multicollinearity is not a problem for factor analysis, it becomes impossible to determine the unique contribution to a factor of the variables that are highly correlated. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test were therefore requested in the statistical output as, although the sample size should provide a stable factor solution with the number of variables included in the factor analysis, the partial correlations were a concern. The KMO test represents the ratio of the squared correlation between variables to the squared partial correlation between variables and would therefore indicate whether factor analysis was appropriate in such circumstances. Additionally, Bartlett's test would confirm whether or not the correlation matrix resembled an identity matrix i.e. where the variables correlate only with themselves indicating no cluster of variables. There needs to be some relationship between variables for factor analysis to work and where this not apparent factor analysis would be inappropriate. Principal component analysis was chosen as the method for conducting the factor analysis and the correlation matrix was requested as opposed to the covariance matrix due to the issues of incommensurate data – although given that all the variables included in the factor analysis were logarithmic transformations of the original data, the covariance matrix could arguably equally have been used. A display of the unrotated factor solution and a scree plot was requested, asking for eigenvalues over 0.7 (Jolliffe's recommendation). Given that the variables correlated, any factors might also correlate and therefore oblique rotation was chosen over orthogonal, using the direct oblimin method. Missing data was excluded listwise rather than pairwise and social disadvantage factor scores were saved for use in further analysis.

4.2.12.5 Simple regression

As can be seen in the following chapter, only one factor was extracted using factor analysis. Simple regression was performed using the social disadvantage factor scores and the dependent variables full duty decisions and total decisions (see 5.2.4 later). Given that the factor analysis only accounted for 87% of the variance of the remaining variables, it was decided to run simple regression for each remaining individual predictor variable against the dependent variables to see if the social disadvantage factor scores produced a better overall model or whether an individual variable provided better results. The results of the regressions are discussed in the next chapter. In addition to the simple regression, regression was also run on both of the dependent variables using combinations of the remaining independent variables that didn't show unreasonably high collinearity with each other.

4.2.12.6 Possibility of path analysis

As simple regression had already been performed on all of the remaining variables and standard regression coefficients been obtained, path analysis was considered as a possible next step to further examine the pattern of relationships between the variables. However, in order for such a process to be useful, causal links between the variables had to be hypothesized from the outset. Hypothesizing for example whether poor health causes poverty or poverty causes poor health is a somewhat circular argument and has already been discussed earlier in this research. Such circular debate does not provide for clear conclusions and leads to subjective hypotheses which could misdirect the research and provide invalid results. Further discussion on causality is outside the scope of this report. Path analysis cannot establish causality (Bryman and Cramer, 2002); it can only provide quantitative estimates of the causal connections between variables and this is not something that would be directly useful in predicting levels of homelessness. Path analysis was not therefore undertaken as part of this research.

4.2.12.7 Analysis at different levels of the administrative hierarchy.

Although examination of the data at Local Authority level did produce interesting and potentially useful models, there were also three variables at different levels that could potentially improve the models; two at county level and one at PCT level. The data for the relevant predictor variables was therefore amalgamated to correspond with the county level and PCT variables in order that the relationships between the variables at these levels could be assessed. It was not meaningful to simply add together the social disadvantage factor scores for the one factor that was extracted by factor analysis to make the scores compatible with the county and PCT level data, as extraction involved a complex interplay between a number of variables and this would not be reflected in amalgamation. In any event, regression analysis revealed that single predictor variables produced a model as good as that produced with social disadvantage factor scores. It was not therefore appropriate to use the local authority level social disadvantage factor scores at county level analysis. A fresh factor analysis would therefore have been carried out on the amalgamated county level variables if multicollinearity was still a problem creating bias and instability in the model at these levels however this proved to be unnecessary. The new amalgamated variables were assessed for normal distribution as well as the other assumptions of parametric testing and failed to satisfy the requirements. The variables were therefore transformed using log transformation and the distribution statistics were rerun on the new transformed variables. After transformation, the new variables at both county level and PCT level did satisfy the requirements for parametric testing and scatterplots and correlation statistics were then run against the dependent variables for each level. Once correlation analysis had been run and relationships between the variables at county level and PCT level had been identified, regression analysis was run on the relevant variables to see if the regression model obtained at local authority level could be improved upon by including variables at county level or variables at PCT level. The results of these analyses are discussed in the next chapter.

When a suitable model had been obtained, residual analysis was carried out to check the assumptions of the model and the outlying and influential cases were investigated for any sign of pattern or explanation as to why the model was not the best fit for them.

4.3 Methods used for testing the model

The purpose of testing was to determine whether the regression models remained stable with different samples. A number of potential models were tested: In addition to the regression model using social disadvantage factor scores there were five other variables that appeared to produce strong regression models for both dependent variables: 'total number of homeless decisions in 2003' as well as 'total number of full duty homeless decisions in 2003'. All of these possible models were tested on different samples to check their stability.

The various models were tested on existing data for two different random samples of 50% of the Local Authorities. The random samples were generated using SPSS. Regression analysis was run using the two different random samples, for both dependent variables using the key predictor variables that had been identified as producing the strongest models in the earlier analysis. The figures for adjusted R^2 were compared with those for R^2 to assess cross-validation of the models. The results of the regression using the random samples are discussed in Chapter 6. After regression had been run using random samples it was also run for the different type of councils. The data was first split into groups. Regression analysis was then run for each of the groups using all six variables that demonstrated a strong relationship with the dependent variables. As the sample size for the groups were much smaller than the overall sample size, the Cook's distances (Cook and Weisberg, 1982) for individual cases within each group were checked to ensure that no particular case was having an undue influence on the model. Where this was evident, the regression was run again excluding the influential outlying case or cases. Additionally, several of the council groupings had very small sample sizes. The sample size for the council type group "Inner London Borough" was unacceptably small for regression purposes. The data was therefore regrouped, amalgamating the London Borough Councils into one group instead of two by creating a new variable. This process still failed to produce adequate sample sizes for regression purposes so the London Borough Councils were regrouped with the Metropolitan Borough Councils to increase the sample size to a more meaningful level. The council groupings for city and unitary authorities were also amalgamated for this purpose. Again, the results of this analysis are detailed in Chapter 6. The results for the regressions run on the small subsets are detailed in grey to highlight that they should be regarded with less significance than the more acceptably sized subgroups, detailed in black.

4.4 Conclusion

This chapter has provided an overview of the various methods employed and the rationale behind decisions made about how best to proceed with the exploratory analysis. It highlights the problems of availability of appropriate statistics and looked at what credible and reliable statistics were available at Local Authority, County and Primary Care Trust level. Theory had indicated that there were a number of issues that could potentially precede homelessness and the search for useable statistics focussed on these specific issues. For univariate analysis, various methods were employed to assess the distribution of the data and to decide whether the data was suitable for parametric testing.

Bivariate analysis was then conducted to examine the relationships between the variables. This analysis included methods to look at the distribution of the variables as well as methods to assess and deal with high levels of collinearity. This process reduced the number of variables to a more manageable level for multivariate analysis. Various methods were employed at the multivariate level including multiple regression analysis, factor analysis and ultimately, basic simple regression, although other methods were also considered throughout the process of exploratory analysis. Key variables were identified at County level and Primary Care Trust level as well as Local Authority level and modelling at the different levels of the administrative hierarchy was consequently explored. Methods to ensure reliability and validity were used throughout the exploratory process. The results of the various stages of analysis detailed in this chapter are detailed and discussed in the following chapters.

Chapter 5: Results of statistical analysis and discussion

5.0 Introduction

This chapter provides the results of the statistical tests undertaken at a univariate, bivariate and multivariate level. Where appropriate, it includes a discussion of the main findings as well as detailing some of the problems encountered and their implications.

The univariate analysis looked at the distribution of the data for all variables as well as potential grouping of the data based on council type, geographical size and population size to see if normal distribution was apparent within sub-groups. The chapter considers the issue of transformation of the data in an attempt to normalise the distribution of the variables so that parametric tests can be used. Reliability of the measures is checked during the univariate analysis and the assumption that variables are also independent from each other is also considered.

The bivariate analysis examines the relationships between the predictor variables and the outcome variables and also considers relationships between different predictor variables. This was done by visual representation of relationships, the use of Pearson's correlation coefficient and partial correlation analysis. The chapter also addresses the issue of dependent variable selection and looks at whether there is a issue of time lag.

The chapter also provides the results of multivariate analysis. This starts with a discussion of a regression analysis using all of the variables that remained after the filtering process of the bivariate analysis, considering the reliability and validity of the model produced. The chapter details the results of the factor analysis that was subsequently run for the remaining variables and goes on to explore the potential for a model obtained using simple regression for social disadvantage factor scores as well as each individual remaining variable. The chapter than looks at whether these potential models could be improved by including one or more of the other remaining variables or by including remaining variables from different levels of the administrative hierarchy. Again, partial correlation analysis was used to assess levels of shared variance in the outcome variable.

Finally, the chapter looks at analysis of the residuals for the potential regression models and whether outlying cases were cause for concern. The chapter concludes that simple regression using any one of a number of predictor variables at Local Authority level appears to produce a strong model and that it would be appropriate to test the strength and stability of all possible models further to establish which provided the best fit for the data.

5.1 Univariate results and analysis

There are several reasons why it was considered important to undertake univariate analysis on the data. Firstly, it was important to establish whether the distribution of the data satisfied the assumptions for parametric testing. Secondly, graphing and screening the data enabled any obvious data inputting errors to become more visible as well as highlight any obvious outlying cases. Thirdly, univariate analysis enabled the author to become familiar with the data for the variables considered. The results of the univariate analysis are detailed below.

5.1.1 The outcome variables – the figures on homelessness decisions

5.1.1.1 Local Authority level

The results of the initial analysis can be seen in **Figure 4** which shows distribution statistics for all outcome variables at Local Authority level. One of the main issues highlighted by this analysis was the wide range of data. The sample contained all councils in England (except for City of London Council). It came as no surprise that the total number of homeless decisions taken in any one quarter was wide ranging. This was also the case for the number of full duty decisions. The means were generally much higher than the medians which suggested that the distribution of this data was generally positively skewed. The large majority of the cases had decision numbers that were comparatively small and the overall statistics were heavily influenced by a few cases where thousands of decisions on homelessness were made each quarter.

The distributions for the outcome variables at Local Authority level deviated from normal distribution and were all positively skewed and fairly leptokurtic. Both the skew and kurtosis figures showed a marked improvement in the later years (2003 and 2004). In normally distributed data the mean and the median should be the same. This was clearly not the case with these variables; with the mean being almost double the figure for the medium in all instances. This positive skew highlights the lack of normal distribution in the data. Additionally, looking further at the dispersion of the data, the ranges and standard deviations are large. The large standard deviation figures provided further indication that the mean does not provide a good representation of the data and confirmed that the data for these variables was not normally distributed.

5.1.1.2 County level

The results of the initial analysis can be seen in **Figure 5** which shows distribution statistics for all outcome variables at County level. As was expected, the data at County level demonstrated a very similar pattern to that at Local Authority level. The pattern of skew was repeated at County level analysis, with all the histograms being positively skewed and leptokurtic. The kurtosis and skew figures tended to be smaller in the later years of 2003 and 2004. The mean and medium figures were also dissimilar; with the figure for the median being roughly three quarters that of the mean in the large majority of cases although these figures did tend to converge towards each other in 2004. This differential between the mean and the median supports the idea of positive skew in the distribution. The pattern of a large range and standard deviation is also repeated, emphasising again that the mean is not an accurate representation for these variables and that normal distribution is not demonstrated.

5.1.1.3 PCT level

The distribution statistics for all outcome variables at PCT level are shown in **Figure 6**. The sample consisted of 199 cases. Again, not surprisingly, there was positive skew shown on all the distributions. Skew and Kurtosis again tended to be lower in the 2004 figures. The mean and median were still significantly different from each other, with the figure for the median being roughly two thirds that of the mean in almost all of the variables, again, supporting the idea of positive skew. Once again, the ranges and standard deviations were high, again pointing to a non-normal distribution for the variables.

5.1.1.4 Summary of univariate analysis of outcome variables

The high standard deviations along with the level of skew and kurtosis in the data for these variables were significant across all levels of univariate analysis (local authority, county and PCT). The skew and kurtosis were less pronounced at county level than at local authority level and this was probably due to the reduced sample size and the consequential amalgamation of data. The figures for skew and kurtosis from the PCT level variables fell between those of the local authority level variables and the county level variables. This is no real surprise as the level of amalgamation of data is generally between that of the other two levels. The general reduction in the skew and kurtosis figures in the later data (2003 and 2004) may be due to an increased focus on the issue of recording in an attempt to improve transparency and accountability for decisions; this change being generated by the changes in legislation in 2002 (see 1.1.2 earlier). These changes may arguably have reduced the subjectivity in dealing with and reporting homelessness. The results may be due to homelessness receiving an increase in public and Central Government attention and Local Authorities consequentially tightening their procedures in order to avoid increased challenges and justify funding requirements. However this is merely speculative and it might just be that the pattern of homelessness itself changed over this time period.

In summary, initial analysis revealed that all of the possible outcome variables at all levels (local authority, county and PCT) were not normally distributed, with significant positive skew being the main issue. A summary of the assessment of normal distribution for all variables at all levels can be seen at **Figure 7**. Whilst positive skew was the main concern, the distribution produced in some of the histograms showed a possible bimodal or multimodal distribution which suggested that there may be groups within the data.

5.1.1.5 Subgroup possibilities

In order to determine whether any obvious normally distributed subgroups existed with the data, frequencies and distributions were run for all data broken down into council type, as well as council size and population of the area. The frequencies for the various groups using the three different methods of split are shown in **Figure 8**.

The split into Council type highlighted that the majority of councils in the country were either Borough or District Councils. These categories accounted for 64% of cases (225 out of 353). The split into groups of geographical size highlighted that 68% of all councils covered a geographical area smaller than 41,000 hectares, with a further 19% covering an area between 41001 and 81000 hectares. There were only five councils who were responsible for areas greater than 161000 hectares. The split into groups of total population figures highlighted again that the vast majority of councils (82%) had a total population of less than 200,000 people and only 1% of councils (3 cases) had populations of over half a million people. Not surprisingly therefore, the distributions for the size and population groupings were not normal. These groupings painted a general picture of the majority of authorities being responsible for relatively similar sized geographical areas and relatively similar population figures, with a minority of councils being responsible for serving a huge geographical area and a minority of councils having to serve a vast amount of people.

The distribution of each of the variables grouped according to council type, size grouping and population grouping was analysed to see if there was normal distribution within the subsets and consequently whether parametric tests would be possible on the data after all. A summary of the results of these various groupings is shown in **Figure 7**. Specifically, histograms and QQ plots were compared and the distribution figures along with the Kolmogorov-Smirnov figures for data within each group were checked alongside these charts. Whilst it is an issue that with large samples such as the one in this research, the Kolmogorov-Smirnov figure is not always a useful indicator of the extent of deviation from the norm due to small deviations having a significant impact on the figure, at this stage of the analysis, the figures for Kolmogorov-Smirnov are arguably more relevant as the number of cases within the groups are much smaller than the overall sample size. This exploration of the data led to the conclusion that grouping in terms of Council type failed to provide sufficient evidence of normal distribution within each group and therefore the use of parametric tests on the grouped outcome variables would still not be justifiable. For the split into size, there was a visible lack of normal distribution in some groups. It was therefore not considered necessary or worthwhile checking the Kolmogorov- Smirnov figures for the data within each group for what was patently obvious. For the split into population groups, only a quarter of the plots for the outcome variables demonstrated normal distribution within the groups for at least three out of the five groups. The Kolmogorov-Smirnov figures were checked for the data within the groupings of these variables and although, in the majority of these cases, three out of the five groups of data showed no significant deviation from normal distribution, the groups that did contain data that showed significant deviation from the norm often contained a very high proportion of the total cases (sometimes as many as 87%) and it was therefore concluded that the data grouped in such a manner clearly still did not satisfy the requirement for normal distribution necessary for parametric testing.

The various groupings also provided an opportunity to check whether homogeneity of variance existed between the different groups. This is also summarised in **Figure 7**. Unfortunately, this proved not to be the case for all of the outcome variables at local authority level.

5.1.1.6 Transformation

The fact that the variables were not normally distributed and failed to demonstrate homogeneity of variance within groups of the data posed a potential problem for further analysis and whether parametric or non-parametric tests could be used. Parametric tests are generally considered more robust and therefore preferable to non-parametric tests. They are called parametric tests because they are based on assumptions that we know certain characteristics of the population from which the sample is drawn. It is generally considered inappropriate to apply parametric statistical tests to variables which are profoundly skewed when the test presumes normally distributed data (Field, 2005). For this reason, the outcome variables for all levels were transformed using log transformation and then reassessed. The distribution statistics for the resultant log variables can be seen at **Figure 9**.

As can be seen by the results for transformation at Local Authority level, the figures for the mean and the median are very similar in each case and the figures for standard deviation are very low. The skew and kurtosis figures are also greatly improved. The histograms showed that the log variables were clearly normal in their distribution, consequently improving the potential for use of parametric tests. This pattern was repeated with transformation of county level and PCT level data.

5.1.1.7 Reliability

It was decided to conduct Cronbach's alpha reliability tests on the untransformed data and to use subsets of the data for the purposes of calculation. This was due to the fact that the top half of the equation for this test includes the number of items squared (which is then multiplied by the average covariance between the items) and consequently, as the number of items increases, so does the figure for alpha (Cortina, 1993). Having 45 items (outcome variables) on one scale may have given a distorted picture of the reliability of these measures so subsets of no more than 10 items per scale were used. Subsets for the outcome variables were based on each year of data collected. A figure of 0.8 or higher is generally considered to indicate a reliable scale (Kline, 1999; Field, 2005). **Figure 10** provides a summary of the results for Cronbach's Alpha test for all groups of variables at all levels. As can be seen in **Figure 10**, the outcome variables consistently showed a figure of at least 0.9.at local authority and PCT level and at least 0.898 at county level. It was therefore concluded that these measures did have a reasonable degree of internal reliability.

5.1.1.8 The assumption of independence

One of the main purposes of this initial investigation of the data was to identify whether or not the assumptions for parametric testing were satisfied, one of which in this case was whether or not the results for each council were independent from the results of the other councils. Although councils would no doubt claim that the behaviour of an adjoining council for example would not affect their own behaviour, the reality is often somewhat different. If for example a particular council is using a very narrow and seemingly harsh interpretation of the law, having the effect of excluding applicants from assistance, potential applicants may instead choose to apply to a neighbouring council where they perceive they might get more favourable consideration. The second council may well react to such perceived practice by altering their approach to more closely coincide with that of the first council in an attempt to deter cross-council boundary migration of potential homeless applicants. Additionally, staff from Local Authorities regularly meet with their peers from other neighbouring councils to share problems and good practice. One of the main purposes of this networking is to try to establish a level of consistency in working practice by sharing information. The data collected for each local council will not therefore be completely independent from another. However, as there is no way that these issues can be quantified, for the purposes of this analysis, independence was assumed.

5.1.2 The predictor variables

5.1.2.1 General demographic variables

There were six general demographic variables, all at local authority level and the distribution statistics for these variables can be seen at **Figure 11**. There were no cases missing in any of the following results for these variables. The variable for council type (gen5) was used as a grouping variable for the data. Variables showing size of authority in hectares (gen1) and total population of the authority (gen2) were also used as grouping variables after being split into categories and recoded as variables gen1gp and gen2gp respectively.

For size in hectares (gen1) the range was vast, ranging from 1213 to 240768 hectares. The mean and the median were not close to each other and the standard deviation was large. These figures suggested that the mean was not a good representation of the data and that it was not therefore normally distributed. This was confirmed by the histogram and the QQ plot and the figure for Kolmogorov-Smirnov affirmed significant deviation from the norm. Grouping the data failed to show normal distribution in the subgroups and whilst logarithmic transformation did produce a histogram and QQ plot approximating to a normal distribution, it was questionable whether parametric tests could be used with this variable, even when transformed.

For variable gen2 (total population), again the range was large. However, the mean and the median were relatively close to each other and the standard deviation was reasonable in relation to the mean. The histogram did approximate to a normal distribution but the QQ plot was not ideal and the figures for skew and kurtosis raised further concerns about whether the data was normally distributed. When the data was grouped, normal distribution was evidenced in three out of the five groups for size of authority and in five out of the seven groups for council type. The Kolmogorov-Smirnov figures confirmed no significant deviation from the norm for the majority of the groups, with the majority of cases falling within the groups that were normally distributed. It was therefore considered appropriate to use parametric tests with this variable.

The general variables for males (gen3) and females (gen4) not surprisingly showed similar patterns in the data. Given the large range for both variables, the distribution figures did suggest a distribution approximating to the normal and this was supported by the histograms. Whilst this was not fully supported by the QQ plot, when grouped the majority of groups for council type did demonstrate normal distribution and this was substantiated by the Kolmogorov-Smirnov figures showing no significant deviation from the norm for the majority of groups (which included the majority of cases)(see **Figure 7**). It was therefore considered appropriate for these variables to be used with parametric tests.

Gen5 was the only nominal variable in the data and was used to group cases into council type. The frequency data can be seen at **Figure 12**. The biggest groups by far are the groups for district and borough councils, accounting for a total of almost 64% of all of the councils. Unitary councils make up 13% of the total cases and city councils account for 6%. Inner and Outer London Borough Councils together with Metropolitan Borough Councils make up the remaining 17%.

Population density as at 2001 in terms of number of people per hectare (gen6) indicated a non-normal distribution of the data and this was clearly confirmed by the histogram and QQ plot. When grouped into size groupings, the histograms and QQ plots for the groups of the larger geographical areas did show normal distribution of data however, these groups did not include the majority of cases. After logarithmic transformation the histogram and QQ plot for the data did show normal distribution so parametric testing could be used on the transformed data.

5.1.2.2 Housing variables

There were nine possible variables investigated under this category; three at local authority level and six at county level. The results for these variables can be seen at **Figure 13**.

The three variables at Local Authority level looked at social housing mean rent levels for all dwellings, one bedroomed dwellings and three bedroomed dwellings as at 31/03/02. One concern of using these indicators was that they may not have been representative of the housing distribution across the country; in particular, rural areas are likely to have fewer one bedroomed units than urban areas. Information available at parish level may have helped with assessing whether this was the case however this was unavailable. Each of the variables demonstrated a similar pattern in the data, with the figures for mean and median being similar to each other in all three instances. The statistics for all of these variables pointed to a relatively normal distribution with the mean being a good representation of the data. The histograms also suggested normal distribution of data for all three variables and this was supported by the QQ plots. Skew and kurtosis figures were small and showed very little leptokurtic or platykurtic distribution throughout the data. When the data was divided into groups of council type, size and population numbers, normality of distribution was maintained in the large majority of the subgroups of each grouping method and the Kolmogorov-Smirnov figures provided further evidence of no significant deviation from the norm (see **Figure 7**). It was therefore considered that these variables were suitable for use with parametric tests.

Cronbach's Alpha test on these three variables demonstrated a good degree of internal reliability (see **Figure 10**).

For the housing variables at county level the pattern was a very different one. The mean and medians were not close and standard deviations for both of the variables looking at the average price of a semi detached property (housing 4 & 5) were high in relation to the mean. These statistics did not support normal distribution. Neither variable demonstrated normal distribution of data in their histograms nor their QQ plots and logarithmic transformation failed to rectify this issue. It was not therefore considered possible to use parametric tests on these variables.

For the variables detailing the average price of a flat (housing6 & 7) the large range, the differences between the figures for the mean and median and the large standard deviation all suggested non-normal distribution of the data. Unfortunately, the histograms for these variables did not demonstrate normal distribution of data either and the QQ plots and Kolmogorov-Smirnov figures confirmed this position. The data was transformed using logarithmic transformation and then did demonstrate normal distribution on the charts. It was therefore considered possible to use parametric tests on the transformed variables.

For housing8 and housing9, the average residential property price for 2000 and 2001 respectively, the distribution statistics and the pattern on the histograms and QQ plots once again showed non-normal distribution for the untransformed data. When the data was transformed using log transformation, the histograms for both years suggested normal distribution but the QQ plot only supported this for the 2001 data. It was therefore decided that only the transformed data for 2001 could be used with parametric tests.

Cronbach's Alpha test was carried out on these six variables and confirmed a good degree of internal reliability amongst these measures (see **Figure 10**).

5.1.2.3 Poor Health variables

There were three variables under this category; number of people with a limiting long term illness (poorhealth1) and mental illness admissions and discharges (poorhealth2 and poorhealth3). The summary statistics for these variables can be seen at **Figure 14**.

Firstly, considering the data for limiting long term illness: The figures ranged from a minimum value of 278 to a maximum value of 191998. This massive maximum figure was from Birmingham and represented almost 20% of the entire population of the area as having a limiting long-term illness. Although there was some diversity between the figures for the mean and the median and the standard deviation was high, the histogram showed a relatively normal distribution. This was not however supported by the QQ plot so further investigation of the possible subgroups was undertaken. Normal distribution was evidenced in the histograms and QQ plots in the majority of the groupings of size, population numbers and council type. The figures for Kolmogorov-Smirnoff were therefore checked for each of these groupings and whilst no significant deviation from the norm was demonstrated in the majority of the subgroups, the number of cases that fell into a group where data did show a significant deviation from the norm was high and therefore the data in its raw form was considered as inappropriate for use with parametric tests. Log transformation did produce normality of distribution in the histograms and QQ plots for the data as a whole as well as within the groupings for council type and population numbers although homogeneity of variance was not demonstrated among the groups. Nonetheless, the transformed data was considered appropriate for parametric testing (see **Figure 7**).

The data for mental illness admissions (poorhealth2) and discharges (poorhealth3) was only available at PCT level and both showed similar patterns. Whilst the histograms for both variables indicated a relatively normal distribution this was not substantiated by the statistics, the QQ plots or the Kolmogorov–Smirnov figures all of which showed significant deviation from the norm for both variables. Log transformation was once again tried with a view to obtaining normal distribution of data and this was very successful for both variables. Parametric tests would therefore be potentially useable with the transformed variables.

Cronbach's Alpha test was carried out on the last two variables under the category of poor health and produced a figure of 0.936 suggesting internal reliability of these measures (see **Figure 10**).

5.1.2.4 Ethnicity variables

Five variables were investigated under this heading, all at Local Authority level. The results can be seen in **Figure 15**

For data on white population numbers (ethnicity1), the histogram did indicate normal distribution of data but this was not supported by QQ plot. The data was therefore reassessed in groups of council type, size and population numbers. Histograms and QQ plots demonstrated normal distribution in five out of the seven groups of council type. The Kolmogorov-Smirnov figures for the distributions within each of these groups showed no significant deviation from the norm in the majority of groups with the majority of cases falling within these groups. This variable was therefore considered appropriate for use with parametric tests.

For data on mixed race population numbers (ethnicity2) again, the statistics indicated non-normal distribution and this was confirmed by the distribution plots. Normal distribution also failed to be apparent in any of the groupings of data. Log transformation produced a histogram and QQ plot showing normal distribution for the data as a whole as well as normal distribution within the groups of council type although homogeneity of variance was not shown. It was nevertheless concluded that parametric testing would be possible with the transformed data.

For data on Asian population numbers (ethnicity3) the substantial difference between the mean and median and the large standard deviation suggested that the data was not normally distributed and this was confirmed by both the histogram and the QQ plot for the data. No normal distribution was shown in any of the subgroups within any of grouping methods; however when the data was transformed using logarithmic transformation, the histogram and QQ plot for the data did demonstrate a normal distribution as well as homogeneity of variance between groups of the transformed data. Parametric tests could therefore potentially be used in the transformed variable.

For the data on black population numbers (ethnicity4) again, the substantial difference between the mean and median and the large standard deviation in relation to the mean suggested that the data was not normally distributed and this was confirmed by both the histogram and the QQ plot for the data. Very little normal distribution was shown in any of the subgroups within any of grouping methods. However when the data was transformed using logarithmic transformation, the histogram and QQ plot for the data did show a normal distribution in the full data set as well as within the groups of council type and population numbers. Homogeneity of variance between groups was not demonstrated but the transformed variable was still considered suitable for parametric testing.

The data on the total non-white population numbers (ethnicity5) suggested non-normally distributed data and again, this was affirmed by the histogram and QQ plot for the data. Histograms for the grouped data only showed a normal distribution for the London Boroughs and the Kolmogorov-Smirnov figures for the grouping by council type indicated that deviation from the norm was generally significant. The data was therefore transformed, once again using logarithmic transformation. This produced normal distribution of data and normal distribution within the grouping of council type. Again, homogeneity of variance between groups was not demonstrated but it was nevertheless deemed appropriate for parametric testing to be used on the transformed data.

Cronbach's Alpha test was conducted on these five variables (see **Figure 10**) and produced a result of 0.569. However, due to the wide differences in ranges of the variables, it was considered more appropriate to consider the test result based on the standardised items. This provided a figure of 0.916 which was an acceptable figure for reliability purposes. As an extra assurance, the unstandardised figure for Cronbach's alpha test is 0.804 if the figure for ethnicity1 is removed from the calculation. Generally speaking, the numbers for this variable are much larger than the numbers in the other ethnicity variables and will therefore inevitably skew the results for an unstandardised reliability score. The results for Cronbach's alpha test are therefore considered to demonstrate a good degree of reliability for these variables.

5.1.2.5 Poverty variables

There were six variables under this category, all at Local Authority level and the results of these can be seen at **Figure 17**. A summary of the distribution checks is shown in **Figure 7**.

The data for total income support claimants for 2000 (poverty1) and 2001 (poverty2) failed to shown normal distribution in the distribution statistics, histograms and the QQ plots. In both variables, the medians were again similar to each other but very different to the means. This supported a non-normal distribution. This was further evidenced by the large standard deviations. The distribution within groups was therefore investigated and normal distribution was indicated in the majority of the groups for council type and population number. However normal distribution for the majority of the groups was only confirmed by the Kolmogorov-Smirnov figure for poverty1, where the majority of cases fell into groups that demonstrated normal distribution. Poverty2 did not satisfy the requirement of normal distribution until transformed using logarithmic transformation. Consequently, parametric tests were considered possible on the untransformed data for poverty1 and on the transformed data for poverty2.

The data for the total number of claimants for Income Based Job Seekers Allowance for 2000 (poverty3) and 2001 (poverty4) both failed to show normal distribution without logarithmic transformation. Grouping of the untransformed data into council type did show some level of normal distribution in the majority of groups but this was not supported in any way by the Kolmogorov–Smirnov figures. Once transformed, the histograms and QQ plots showed normal distribution as did the charts for each of the different groupings of the data. The transformed grouped data also showed homogeneity of variance amongst the different groups using Levene's test. Parametric tests were therefore considered appropriate on the transformed data.

The remaining two variables in this category looked at the levels of non-activity in the working age population; firstly poverty5 looked at the number of unemployed people aged 16 to 74 who have never worked or who were long term unemployed. The statistics suggested a non-normal distribution and this was supported by the histogram and QQ plot. The histograms and QQ plots for the data grouped by council type did show some pattern of normality in the majority of the groups but the Kolmogorov-Smirnov figures indicated significant deviation from the norm in all the groups except for the London Boroughs and the majority of cases fell into groups that did not show normal distribution. Logarithmic transformation did produce a normal distribution within the data as a whole well as within the groupings. Homogenity of variance amongst the groups was also evidenced by Levene's test so parametric testing on the transformed data for this variable would therefore be possible.

The final variable in this category (poverty6) looked at the number of people aged between 16 and 74 who were economically inactive. The data and histogram did suggest a normal distribution but the QQ plot did not support this. The skew and kurtosis figures suggested further investigation was necessary. When the data was grouped, the majority of groups for council size and population numbers showed normal distribution in their charts and this was affirmed by the Kolmogorov-Smirnov results. The large majority of cases fell into groups that showed no significant deviation from the norm and parametric testing on this variable would therefore be possible (see **Figure 7**).

Cronbach's Alpha test was conducted on these six variables and produced a result of 0.809 and 0.975 when standardised items were used in the calculations owing to incommensurate data. The result could have been marginally improved by removing the variable poverty6 from the calculations but even with inclusion of this variable the measures were considered as reliable.

5.1.2.6 Relationship Breakdown variables

There were five potential variables under this category: number of people legally still married but separated, divorced, widowed, a total of these three groups and the number of people with no religion. As well as the general concerns about the accuracy of these data, it was acknowledged that the data would under-represent the issue of relationship breakdown as it did not account for relationship breakdown amongst cohabiting couples. The distribution statistics for these variables can be seen at **Figure 17**. Again, **Figure 7** provides a summary of the distribution checks.

The data for numbers of people separated but still married (relationship1) suggested a distribution approximating to normal although the high figure for standard deviation raised concerns. Normal distribution was supported by the histogram for the data but not confirmed by the QQ plot. When the data was grouped, the histograms indicated a normal distribution for the majority of the groups of council type and of population numbers but this was not confirmed by the Kolmogorov- Smirnov figures for the groups, with the majority of cases falling into groups that showed significant deviation from the norm. Log transformation of the variable did produce normal distribution and parametric tests were therefore considered possible on the transformed data.

The data for number of divorced people living in the area (relationship2) did not show normal distribution. Grouping of the data into council type did however reveal normal distribution in the majority of the groups with the Kolmogorov-Smirnov figures confirming no significant deviation from the norm for the majority of grouped cases. It was therefore considered appropriate to use parametric tests on the data.

Initial analysis for the data for widowed people living in an area (relationship3) did not show normal distribution. Normal distribution was shown in the histograms and QQ plots for the majority of the groups of council type as well as in the majority of groups of population numbers. The Kolmogorov-Smirnov figures confirmed no significant deviation from the norm in most of the groups and the large majority of cases fell into these groups. The assumption of normal distribution for the purposes of parametric tests was therefore considered as being satisfied.

The data for variable relationship4 (total relationship breakdown numbers) demonstrated the same pattern as relationship3. The grouping revealed normal distribution within the groups of population and council type and the Kolmogorov-Smirnov figures confirmed no significant deviation from the norm in the majority of groups which included the majority of cases. Parametric testing was therefore considered possible for this variable.

The data for the numbers of people with no religion (relationship5) again showed a similar pattern to that of relationship3 & 4, with the statistics and plots all suggesting non-normal distribution. The groupings showed normal distribution for the majority of the groups for both council type and population numbers. Normal distribution was confirmed by the Kolmogorov-Smirnov figures for the majority of the groups and parametric testing was therefore considered appropriate for this variable.

Cronbach's Alpha test was carried out on this group of variables (see **Figure 10**) and the result was 0.864. This could have been improved to 0.887 if the variable relationship1 was removed from the calculation but even with this variable included, the measures were considered as reliable based on this result.

5.1.2.7 Sex and Age Variables

There were eight possible variables for sex and age, all at local authority level and the results for these variables can be seen at **Figure 18**. Again, the summary of distribution checks can be seen at **Figure 7**.

The distribution statistics and plots for the numbers of 16 and 17 year olds in the population (sexage1) raised concerns over whether the distribution of the data was normal. Whilst this appeared to be the case from the histogram, the QQ plot did not support the idea of normal distribution and the figures for skew and kurtosis were high. Groups of the data were therefore investigated. The groups demonstrated normal distribution in the majority of the groups of council type and population numbers. The Kolmogorov-Smirnov figures for the groupings didn't however substantiate normal distribution, showing that the majority of cases fell into the groups that were not normally distributed. The data was therefore transformed using logarithmic transformation and this produced normal distribution. Parametric tests could therefore be used with this variable provided that they were used on the transformed data.

The data for the numbers of people with no qualifications (sexage2) suggested non-normal distribution. When the data was broken down into groups of size, council type and population numbers, the groups did demonstrate normal distribution in the majority of the groups in each of the different groupings. Normal distribution was confirmed for the grouped data with the Kolmogorov-Smirnov figures showing no significant deviation for the majority of the groups and the majority of cases fell within these normally distributed groups. Homogeneity of variance between the different groups was not demonstrated by Levene's test but nonetheless, the variable was still considered possible for parametric testing.

For the numbers of under 18 conceptions for 1998 – 2000 (sexage3) and for 2001-2003 (sexage4), the distribution appeared the same for both variables. The distribution statistics suggested that the mean was not an accurate representation of the data and that the data was not therefore normally distributed. The histograms for these variables both appeared normal, albeit with a fair degree of leptokurtic distribution and a positive skew, but normal distribution was not supported by the QQ plots. Looking at the groups within the data, both variables demonstrated normal distribution in the majority of groups of council type and in all but the largest group of population numbers and the Kolmogorov-Smirnov figures for the groups confirmed no significant deviation from the norm in the majority of the groups. That said, there were a large amount of cases that fell into groups that were not normally distributed and it was therefore questionable as to whether parametric testing on the data would be appropriate. After logarithmic transformation normal distribution was evidenced in the data as a whole and in all of the groupings. It was therefore felt more appropriate to use the transformed data for parametric testing.

The variables providing numbers of young people (under 20) on Income Support in 2000 and 2001 (sexage5 and sexage6) and those looking at the numbers of young people (under 20) on income based Job Seekers Allowance (sexage7 and sexage8) all showed very a similar pattern, with the distribution statistics and plots indicating non-normal distribution. Sexage7 & 8 also failed to show normal distribution when grouped. The Income Support variables, sexage5 & 6, did show normal distribution when the data was split into groups. All of these variables did however demonstrate normal distribution in the entire data as well as the various groupings when the data was transformed. Parametric tests could therefore be used on the transformed data.

Cronbach's Alpha test was applied to the eight variables in this category and produced a standardised figure of 0.986 (see **Figure 10**). As the different measures included in this grouping had very different ranges it was considered more appropriate to refer to the standardised result and consequently, the measures were considered as reliable.

5.1.2.8 Drug variables

There were six potential variables under this category, all at county level, and the distribution statistics can be seen at **Figure 19**. There was one case missing from the calculations in each of the variables. **Figure 7** shows a summary of the distribution checks

The variables for main drug of choice being heroin, methadone and crack (drugs1, 2 & 4) all showed the same pattern in the data. The large differences between the means and the medians and the high standard deviations in relation to the means all suggested that the means were not a good representation of these variables and that they were not normally distributed. The plots and Kolmogorov-Smirnov figures indicated significant deviation from the norm for all of these variables. It was not possible to check for normal distribution in any groupings as there were no grouping variables available at county level. The data was therefore transformed by logarithmic transformation. After transformation the histograms and QQ plots for all three of these variables showed normal distribution and parametric testing was therefore considered possible on the transformed variables.

The pattern for the variables amphetamine use (drugs3) and cannabis use (drugs5) were also very similar to each other. Whilst the large standard deviations and both histograms indicated deviation from the norm, the QQ plots were supportive of a normal distribution. The fact that Kolmogorov-Smirnov showed significant deviation from the norm for amphetamine users was not considered sufficient reason to exclude this variable from parametric testing, particularly given the large sample size and the similarity of the data to that for the cannabis users which did not show significant deviation. Both of these variables were therefore considered as appropriate for parametric testing.

The variable for total drug users in an area (drugs6) was the only variable in this category that initially appeared to demonstrate normal distribution. As it wasn't possible to explore normal distribution through grouping, a decision was made that the data was sufficiently normally distributed (based on the histogram and distribution statistics) to satisfy the requirement for parametric testing.

Cronbach's Alpha test was conducted on these six variables and the result was 0.659 (see **Figure 10**). This figure was too low for the measures to be considered as reliable. However, the ranges of the variables were very different and it was therefore considered that the standardised figure would be a more appropriate measure. The figure for the standardised items was 0.835 and this standardised figure could have been improved to 0.958 by omitting variable drugs6 from the calculation. In the circumstances, it was considered that the measures were reliable.

5.1.2.9 Deinstitutionalisation variables

This group was the largest group of potential variables due to the fact that it encompassed four main subject areas, deinstitutionalisation as a result of (i) leaving care, (ii) leaving prison, (iii) leaving mental health care and (iv) leaving the armed forces.

5.1.2.9.1 Leaving Social Services care

This data was only available at County level and looked at the numbers of children and young people receiving services as well as numbers ceasing to be looked after. The distribution statistics can be seen in **Figure 20**. For the two variables detailing numbers of children in need receiving services in a typical week in 2000 and 2001, (deinst2 and deinst3) the data was generally very similar. The means and medians were relatively close to each other and the standard deviations were both reasonably low relative to the mean. This suggested that the mean was potentially a reasonable representation of the data and that the data was possibly normally distributed. For the 2000 figures, the QQ plot verified normal distribution of data as did the Kolmogorov-Smirnov figure which showed no significant deviation from the norm although this was not quite the case for the 2001 figures. In this case the QQ plot did highlight deviation from normality as did the Kolmogorov-Smirnov figure. However, the figures for skew and kurtosis were small and it was felt that in the circumstances, the data did not demonstrate sufficient deviation from the norm to exclude the variable from possible parametric testing.

The data on children ceasing to be looked after in 2000 and 2001 (deinst4 and deinst5) again showed strong similarities as would be expected given that they are apparently measuring the same thing at different points in time. Again the means and medians were relatively close to each other in each of the years. The standard deviation figures were reasonably low in relation to the mean and the histograms both demonstrated normal distribution. The QQ plots indicated some deviation from the norm which was verified by a significant Kolmogorov-Smirnov figure for both variables. That said, the figures for skew for both variables were small in both years and the figures for kurtosis, although significantly higher were still not unreasonable. These variables were therefore still considered possible for parametric testing.

The data for young people who ceased to be looked after (deinst6, deinst7, deinst8, deinst9, deinst10) measured the same thing over a five year period. It therefore came as no surprise that the statistics for all of these variables were very similar. The distribution statistics can be seen at **Figure 20**. As can be seen by the results, the means and medians were close to each other pointing to a possible normal distribution. This was supported by the histograms. The figures for the standard deviation varied but were reasonably low in relation to the means. The increasingly leptokurtic distribution highlighted by the variables may be attributable in part to the increase in the number of young people ceasing to be looked after over the five year period (a total increase of approximately 13%) or may indicate a decrease in the number of authorities discharging either just a few or an exceptionally large amount of young people from their care in any one year. All things considered, it was decided that the assumption of normality of these variables for the purposes of parametric testing was not unduly violated.

Cronbach's Alpha test of reliability was carried out on the nine variables in this subcategory (see **Figure 10**) producing an overall result of 0.684 although the figure based on standardised items was significantly higher at 0.977. It was considered more appropriate to have regard to the standardised figure in this instance due to the larger amount of variables and the fact that their ranges varied significantly. This figure supported the view that these measures were reliable indicators of the same underlying construct.

5.1.2.9.2 Leaving prison

The data used for this category was data on recordable offences (deinst15, deinst16, deinst17, deinst18) and was at Local Authority level. The distribution statistics can be seen at **Figure 21**.

For the number of violent offences against the person (deinst15) the histogram and distribution statistics showed a distribution that was heavily positively skewed and this was confirmed by the QQ plot. When the data was split into subgroups the Kolmogorov-Smirnov figures for the various groupings showed a significant deviation from the norm in the majority of the subgroups, with the majority of the cases falling into groups that did not show normal distribution (see **Figure 7**). The data for this variable was therefore considered as inappropriate for parametric testing in its raw form. Transformation was consequently explored and logarithmic transformation did provide normal distribution of the data, both in the sample as a whole and in the majority of the subgroups. The requirement for homogeneity of variance amongst the groups was also satisfied with the log transformed data. Parametric tests would therefore potentially be possible on the transformed data.

Looking at the data for burglary from a dwelling (deinst16), a similar pattern emerged with the mean not being a good representation of the data. The histogram shows heavy positive skew and the QQ plot showed significant deviation from the norm. None of the grouping methods produced normal distribution in a majority of the groups. Log transformation did show normal distribution for the data as a whole and the majority of the groups. Homogenity of variance was also evidenced between the groups of the transformed data. The transformed variable was therefore considered appropriate for use with parametric tests.

The data for theft of a motor vehicle (deinst17) repeated this pattern again and indicated non-normal distribution. The statistics can be seen at **Figure 21**. This was supported by the histogram and QQ plot. The division of the data into the subgroups did seem to indicate a normal distribution for the majority of the seven different groups of council type. Unfortunately, the Kolmogorov-Smirnoff figures did not confirm the picture and the majority of cases fell into groups that showed significant deviation from the norm. When the data was transformed, the distribution did approximate to normal but the subgroups still didn't demonstrate normality. The conclusion was that parametric tests might be possible on the transformed data but the variable was not ideal for such testing.

The data for theft from a motor vehicle (deinst18) again reiterated the previous pattern of non-normal distribution highlighted within this category (see **Figure 21**) Division into groups failed to show normal distribution in the majority of groups based on size or on council type. The grouping for population numbers did appear to indicate normal distribution of data in the majority of the groups but again, this was not supported by the figures for Kolmogorov- Smirnov which showed that the large majority of cases fell into groups that did show significant deviation from the norm. The data was transformed using log transformation and this did produce statistics and plots showing normally distributed data. The groupings for council type and population numbers also showed normal distribution of data once it had been transformed although homogeneity of variance was not evidenced. Nonetheless, parametric tests were considered possible on the transformed data for this variable.

Cronbach's alpha test of reliability was conducted on this group of four variables and gave a result of 0.908. This could have been improved to 0.936 if deinst16 (burglary from a dwelling) was omitted from the calculation however, as stated above, a result over 0.8 is considered as demonstrating reliability of the measures. As a result, all measures under this category are considered as having a reasonable degree of reliability that they are indicators of the same construct.

5.1.2.9.3 Leaving mental health care

These variables were at county level and covered cases of guardianship under the Mental Health Act 1983 (deinst11, deinst12, deinst13 and deinst14), looking specifically at the number of cases opened and closed in 2000 and 2001. The distribution statistics can be seen in **Figure 22**. Firstly, looking at the variables for numbers of cases opened (deinst12 and deinst14); the mean and medians were close. Whilst this initially suggested a relatively normal distribution, the standard deviation figures for both variables were large in relation to the means and the plots and Kolmogorov-Smirnov figures failed to support normal distribution. It was not possible to check for normality of distribution within subgroups of this data as no grouping variables were included with county level variables. Logarithmic and square root transformation were carried out on the data to try to establish normal distribution and neither transformation method was successful in producing normally distributed data. It was therefore concluded that parametric tests would not be possible on these variables.

For the variables showing the number of guardianship cases closed during the two years (deinst11 and deinst13), the assumption of normal distribution was again a cause for concern. The standard deviation figures were both high in relation to the mean suggesting non-normal distribution. The initial histograms also failed to show normal distribution (see **Figure 7**). Transformation of the data using both logarithmic and square root methods was explored. The lack of normality shown in the histograms, QQ plots and in the transformed data for these variables forced the same conclusion to be drawn. Namely that they would not be suitable for use with parametric tests.

5.1.2.9.4 Leaving the armed forces

The data used as a potential indicator for this issue (deinst1) was far from ideal but nevertheless the distribution statistics can be seen in **Figure 23**. The statistics and histogram clearly demonstrated a non-normal distribution with the large majority of cases having smaller numbers of armed forces personnel living in their area. The deviation from normal distribution was confirmed by the QQ plot and Kolmogorov- Smirnoff figure. Checking for normality of distribution within the subgroups of data based on council type, size and population numbers also failed to demonstrate sufficient normality to satisfy the requirement for parametric testing. The data was transformed and although the plots for the transformed data did show relatively normal distribution, this was not supported by the Kolmogorov-Smirnov figure. Homogenity of variance of subgroups within the transformed data was also checked and unfortunately was not evidenced. As this was the only potentially useable data found that related to leaving the armed forces it was important to avoid exclusion from further analysis at this stage and it was therefore decided that parametric testing on the transformed data would go ahead with an awareness that the assumptions of such testing might not be satisfied to the degree desired.

5.1.2.10 Migration variables

The frequency and distribution statistics for percentage intercensal population change between 1991 and 2001 (migration1) can be seen at **Figure 24**. The mean and the median are very similar, the standard deviation was low relative to the mean and the histogram and QQ plot showed a very clear normal distribution. This was confirmed by the figure for Kolmogorov-Smirnov which showed no significant deviation from the norm. Given the size of the sample, this is extremely supportive of the fact that this data is normally distributed. Normal distribution holds firm even when the data is split into the groups of council type, size groupings and population groupings. A summary of distribution checks is shown in **Figure 7**. The variable was therefore considered as suitable for parametric testing without any transformation.

The data on numbers of people who lived elsewhere but within the associated area twelve months previously (migration2) can also be seen at **Figure 24**. The mean and median figures are not too dissimilar and the standard deviation is relatively low, suggesting normal distribution. When the data was split into groups, the plots for the majority of the groups for size and population and council types showed normal distribution. This was supported by low standard deviation figures and Kolmogorov-Smirnov figures showing no significant deviation from the norm for the majority of the subgroups. Homogenity of variance was not demonstrated with these groupings however, this fact notwithstanding, this variable was considered as appropriate for parametric testing without transformation.

The figures for people who had moved into the area from elsewhere in the UK in the last twelve months (migration3) were less well distributed and are detailed in **Figure 24**. The distribution statistics raised concerns over whether the data was normally distributed and the QQ plot and the figure for Kolmogorov-Smirnov confirmed non-normal distribution. When the data was split into groups, none of the grouping categories showed a majority of groups with normal distribution and again, there was no evidence of homogeneity of variance amongst the different groups. This is summarised in **Figure 7**. When this variable was transformed the plots and statistics demonstrated normal distribution and this normality held firm when the transformed data was split into the various groups. There was also clear homogeneity of variance (according to Levene's test) in the grouped, transformed data. It was therefore considered appropriate to use parametric tests on the transformed data but not the untransformed data.

Cronbach's alpha test of reliability was conducted on this group of three variables. Largely because of the vast difference in range, it was considered more appropriate to look at the standardised figure for the Cronbach's Alpha test. This produced a relatively low figure of 0.579 which suggested that there may be a lack of consistency in the various measures. They clearly are measuring different issues but it was questionable as to whether they were measuring the same underlying construct. The first migration variable was a measure of movement over a much larger time scale whereas the other two migration variables in this group dealt with movement over a much shorter period of time. When the test was therefore rerun for just the last two variables, the standardised result gave a much more acceptable figure of 0.845, demonstrating consistency of measurement and taken together, an improved reliability than if only one measure was used.

5.1.3 Summary of univariate analysis

Initial analysis showed that all 45 of the outcome variables were not normally distributed and needed to be transformed before they could be used with parametric tests. Of the 69 possible predictor variables, normal distribution was only demonstrated with 26 of the variables, with a further 35 fitting the pattern of normal distribution following transformation. Eight variables (seven of which were at county level) failed to demonstrate normal distribution despite transformation and were therefore excluded from parametric tests. Four of these variables fell under the heading of deinstitutionalisation and the issue of leaving mental health care. The other three variables at county level not satisfying the requirement for parametric tests were housing variables looking at the average price of property. The remaining variable failing to demonstrate normal distribution was size of authority. If any of these variables proved to be significantly correlated with the outcome variables non parametric tests would be used to analyse the data. All of the measures demonstrated reasonable reliability however homogenity of variance was not tested in all cases and will need to be explored further later in the analysis in order to confirm that the assumptions of parametric testing are satisfied.

5.2 Bivariate analysis

Bivariate analysis was undertaken in order to determine whether there were relationships between the variables under consideration: Whether changes in one variable occurred when there were changes in another variable. Due to the fact that the data were incommensurate, correlation analysis as opposed to covariance analysis was used for this purpose.

5.2.1 The predictor variables and the outcome variables

The first stage of the bivariate analysis considered scatterplots for the outcome variables against the predictor variables. Scatterplots were generated for all outcome and predictor variables and the predictor variables that failed to demonstrate any association with the outcome variables were excluded from further analysis. Any visible relationship was sought, however, all of the relationships identified were linear and positive in direction. This process of generating scatterplots immediately weeded the number of potential predictor variables down from 69 to 37; 24 at Local Authority level, 11 at county level and 2 at PCT level. A summary of the results of the scatterplot analysis is shown in **Figure 25**. Correlation statistics were then generated for the remaining variables and the results can be seen in **Figure 26**. The results of the scatterplots and bivariate correlation are discussed below.

5.2.1.1 General demographic variables

In the general category, not surprisingly, the plots showed a similar positive linear relationship for total population, males and females and this relationship did not visibly diminish or vary significantly over the four year time period of the potential outcome variables. Pearson's correlation coefficient remained fairly strong and consistent across the whole time period for all three of the general demographic variables. These three variables were however extremely highly correlated with each other. The issue of multicollinearity is therefore a significant issue for this category and is addressed later in this section. At this point, the three demographic variables, gen2, gen3 and gen4 all remained as possible predictor variables.

5.2.1.2 Housing variables

After the initial bivariate analysis, (see **Figure 26**) variables remained in each of the original eleven categories apart from Housing. This was the only category that failed to show a relationship with the outcome variables at local authority level. At county level, again, none of the housing variables showed a linear or other relationship with the outcome variables and there were no housing variables at PCT level. This is contradictory to the findings of Lee et al (2003) which found that rent levels produced the dominant effect in looking at determinants of homelessness in metropolitan areas. The lack of correlation between the outcome variables and social housing rents or private sector property prices meant that there would be no housing variables included in any final model suggested by this research. This was quite significant given that the intention of this research was to explore whether a predictive model for homelessness, i.e. those people with serious housing difficulties, could be produced. Nonetheless, the issue of homelessness not having strong links with rents and property prices is substantiated by the literature as detailed in chapter two (Lemos and Goodby, 1999; Hampton, Heller-Dixon and Langham, 2002;

FEANTSA, 2002). No housing indicators would therefore be included in the multivariate stage of the analysis.

5.2.1.3 Poor health variables

There were three possible predictor variables under this heading; one at local authority level and two at PCT level. Logpoorhealth1 (number of people with limiting long term illness) was at local authority level and the scatterplots showed varying levels of association with the outcome variables with the relationship appearing to be strongest in 2002/3. This relationship was supported by the correlation statistics which indicated a gradual rise in correlation over the two years after the date of the data. One explanation for this correlation might in part be due to the resulting level of economic activity in the area. If a large proportion of the population are unable to work due to limiting long term illness, this will inevitably have a knock on effect in the local economy and levels of poverty in the area. This in turn might lead to an increase in levels of homelessness. This is recognised however as a somewhat spurious link.

The variables logpoorhealth2 & 3 were at PCT level and the scatterplots again indicated a sporadic association with the outcome variables. Logpoorhealth2 related to the number of mental illness admissions and logpoorhealth3 related to the number of mental illness discharges and both were chosen as potential indicators to the levels of mental ill health in the community. Logpoorhealth3 could equally have been placed under the category of deinstitutionalisation and this issue is addressed later in this chapter. Whilst there was fairly consistent correlation between both variables and the outcome variables, correlation for logpoorhealth2 was generally marginally lower than for logpoorhealth3 and both variables showed a lower correlation than logpoorhealth1. At this stage in the analysis it was not practical to look at cross-level correlation so it was only possible to look at the degree of correlation between logpoorhealth2 and logpoorhealth3. These variables were highly correlated with each other. Although, the statistics just fell short of the level for exclusion on the grounds of multicollinearity, logpoorhealth2 showed a high number of outliers in the scatterplots and the pattern of the variance was not consistent. This lack of homogenity of variance coupled with the high collinearity with logpoorhealth3 led to logpoorhealth2 being excluded from further analysis. Therefore, only variables poorhealth1 and poorhealth3 would be used in the multivariate stage of the research.

5.2.1.4 Ethnicity variables

Under the category of ethnicity, only one of the potential five predictor variables showed a relationship with the outcome variables. This was variable logethnicity2 – mixed race population. It was initially considered appropriate to include five potential predictor variables in the analysis as the qualitative evidence in the literature suggested that some ethnic minority groups were more likely to experience homelessness than others. The literature referred specifically to 'black African / Caribbean' households (Harrison, 1999; Shelter, 2004e) but also differentiated this group from 'minority ethnic' households (Carter, 1998; ODPM, 2000, 2001a & b; Shelter 2004e). The literature however failed to provide substantive evidence on the further definition of 'minority ethnic' households in relation to homelessness. The availability of national statistics providing a detailed breakdown of ethnicity amongst the population enabled a number of different ethnicity variables to be included in the analysis so that this area could be investigated more thoroughly.

Correlation between the variable 'mixed race' and the outcome variables was consistently strong for three years after the date of the data (April 2001) peaking at the end of March 2003. It then dropped significantly in 2004 with the relationship becoming visibly weaker and the correlation statistic at its lowest in mid 2004. The literature (Shelter, 2004; Edgar, Doherty and Meert, 2004) suggested that there might be a relationship between the number of black people in the community and the outcome variables. This did not prove to be the case. One possible explanation for the strong relationship between the outcome variables and the mixed race population might be that there may be a weaker community support structure for such an ethnic identity but this is just a hypothesis. In summary, only ethnicity2 would therefore go forward to the next stage of the analysis.

5.2.1.5 Poverty variables

The scatterplots for all of the potential variables under this category demonstrated a positive linear relationship with the outcome variables. However, some of these variables measured the same thing over different time periods. They were included in the initial analysis to help establish reliability of the measure, rather than for both variables to be included in the final model. Poverty1 and logpoverty2 looked at the total number of income support claimants in the area at two different points in time. These variables showed a strong correlation with each other, suggesting reasonable reliability of the measure. However logpoverty2 was significantly higher correlated with the outcome variables, peaking in 2003. Both variables showed a gradual upward trend in correlation for two to three years after the date of the data, with the pattern for both variables then levelling off. This may be related to a time lag between receiving income support and subsequently needing assistance with homelessness although there is no evidence to support this hypothesis. As new legislation in 2002 introduced changes to eligibility for assistance (see earlier in Chapter 1) and correlation with the outcome variables were higher with the 2001 data (logpoverty2), it was considered to be more appropriate to use this variable as opposed to the 2000 data (poverty1) in further analysis.

Logpoverty3 and 4 both looked at the number of claimants for Income-Based Job Seekers Allowance at points in 2000 and 2001. Not surprisingly, the patterns of correlation for both of these variables were very similar; showing a steady rise in correlation over the three to four year period following the date of the data, with both variables peaking at the end of 2004. This suggested a strong correlation with the outcome variables and a good degree of reliability for the measure. The scatterplots for these two variables did however seem to suggest that logpoverty3 was marginally better correlated, showing fewer outliers and a more obvious visual relationship. Again, it was never the intention to include both of these variables and it was therefore decided to discard logpoverty4 and use logpoverty3 in any further analysis.

Logpoverty5 and poverty6 looked at the numbers of people of working age that were not actually working, either due to being long term unemployed or having never worked (logpoverty5) or being otherwise economically inactive (poverty6). The scatterplots pointed to a more consistent correlation with the outcome variables for poverty6 than for logpoverty5 which regularly indicated a number of outliers. However, whilst the consistency of the correlation for poverty6 was substantiated by the correlation statistics logpoverty5 was generally more highly correlated. The association of poverty with homelessness is rarely disputed. It is an accepted phenomenon and is borne out by the correlations highlighted under this category. However, which if any of these variables under this category best represents this issue is not clear at this point and is discussed further later in this chapter. So, variables poverty2, poverty3, poverty 5 and poverty6 remain in the analysis from this point forward.

5.2.1.6 Relationship breakdown variables

Four out of the five possible variables for relationship breakdown showed a positive linear relationship with the outcome variables. The only predictor variable under this heading failing to show a relationship was relationship3 (widowed) although the amalgamated variable of total number of people who had experienced relationship breakdown of some sort (relationship4) was also fairly weak. These two variables were consequently excluded from further analysis: relationship3 due to having no apparent association with the outcome variables, and relationship4 because, being a variable of amalgamated data, it included the non-associated variable relationship3, which effectively weakened the overall correlation figure. Additionally, including amalgamated variables in any model could potentially create ambiguity for the end user and introduce errors to the model – having to be clear about which variables to include and exclude and then process the data before being able to work with it opens up additional opportunities for error. Further, the other data represented by relationship4 as an amalgam was already represented in the other individual correlating variables in this category, all showing a stronger correlation. Variable relationship4 was not therefore contributing any additional information.

The strongest association was demonstrated by logrelationship1 (separated but still legally married), with relationship2 (divorced), also showing a consistent linear relationship but with significant outliers. These relationships are logical ones if considered on a practical level. If married couples experience relationship breakdown it is very likely that one party may need to make alternative living arrangements and may need help from the council either as an emergency, for the short or even for the longer term. These relationships were confirmed by the correlation statistics which showed logrelationship1 to have a very strong correlation with the outcome variables, never dropping below 0.77 and peaking at the end of March 2004. The correlations for this variable show a steady rise from the date of the data to the peak in 2004 and then show a marked decline. This could potentially be due to a time lag issue between relationship breakdown and homelessness. The correlation statistics for the variable relationship2 (divorced) are considerably lower than those for relationship1, with statistics showing a consistent level of correlation across the whole time period considered with no obvious peak, rise or decline. It can take a couple of years for a divorce to become final and ancillary matters such as property division to be dealt with and this lower correlation and consistency over time may be due to stability returning to the lives of individuals after a relationship breakdown. If they are likely to struggle with independent living, it is reasonable to suggest that this issue might come to light before the divorce is final. If they can sustain independent living through the period and upheaval of the divorce they will hopefully be able to continue this practice once the divorce is final. Logically, in the longer term, the fact that someone may be divorced would seem to become less of an issue in relation to their housing situation. The lower correlation figure for relationship2 no doubt took into account the significant number of outliers present in the scatterplot. The pattern of these outliers was not consistent and became more spread out as the numbers increased. This lack of homogeneity of variance for this variable and the questionable longer term relevance led to relationship2 being discarded from further analysis.

Perhaps the more surprising relationship highlighted by the scatterplots is between the outcome variables and relationship5 (number of population with no religion). This showed a consistent positive relationship with the outcome variables with no obvious outliers or signs of deviation. This was supported by the correlation statistics which showed a consistent correlation with the outcome variables across the whole time period. These correlation figures were noticeably higher than those of the variable relationship2 (divorced). Again, one hypothesis for this strong correlation might be that this group may not have access to practical support that may be provided within a religious community. Another, more etherical explanation may be that those with no religion are not able to call or rely upon the support of a higher force.

Whilst the two remaining variables under this category (logrelationship1 & relationship5) showed some degree of correlation with each other, this correlation was not sufficient to warrant further examination under the grounds of multicollinearity. Variables relationship1 and relationship5 would therefore go forward to the next stage of the analysis.

5.2.1.7 Sex and age variables

Of the eight possible predictor variables for sex and age, four out of the potential eight predictor variables showed a positive linear relationship with the outcome variables. The first of these was logsexage1 (number of 16 and 17 year olds in the population) which showed a positive linear relationship with almost all of the outcome variables. The relationship was consistently strong across the whole time period. The relationship between this variable and the outcome variables was noticeably weaker in 2000 / 2001. This may be due to the fact that 16 and 17 year olds were not automatically considered as being vulnerable prior to 2002 and were not therefore automatically entitled to assistance under the homelessness provisions. One reason for the slight weakening of relationship in 2004 may be that the data becomes less relevant as time passes.

Logsexage3 & sexage4 also both showed significant correlation with the outcome variables. These variables both related to the number of under 18 conceptions. Pregnancy is a recognised category of priority need and some level of assistance from the Local Authority would be legally required if requested by the applicant on these grounds. Teenage mums may have less potential to meet their own housing needs, not only in terms of income but also in terms of support and life skills available to them. It is therefore arguably not surprising that there is a positive linear relationship between these variables and the outcome variables. Logsexage3 had a very high correlation with the outcome variables, with a steady upward trend in correlation from the date of the data (end 2000) to the end of March 2004 where correlation peaked. The relationship between this variable and the outcome variables then appeared to start to decline very slightly. The upward trend in the correlation figures would suggest a possible time lag between teenage pregnancy and needing help with homelessness. One potential explanation for this possible time lag might be that friends or family might initially be willing or able to support a young mum when she first has a baby but as time progresses and the child gets older, more practical and emotional pressures may arise within the household, eventually leading to the need to separate. This is however an unsubstantiated hypothesis. Sexage4 showed a similarly high correlation with the outcome variables from the date of the predictor variable data. Unfortunately, it was not possible to see if correlation continued to rise for another couple of years beyond this date as was the pattern with logsexage3 because the time period covered by outcome variables ended at this point. The variable for under 18 conceptions was included for the two time periods in part to check the reliability of the data – to see if the measure produced similar results over time. The correlation figures for the year after the date of the respective data sets were very similar for both variables. This suggested some reliability of the measure. It was never the intention for both time periods to be included in any final model. Based on the results of both variables and the lack of longer term correlation data for sexage4, it was decided to discard sexage4 from further analysis.

The other variable showing a relationship under this category was the number of income support claimants under the age of 20 as at August 2001 (logsexage6). The correlation statistics were again high for this variable, showing a steady increase over the two and a half years after the date of the data (August 2001), peaking at the end of March 2004. Correlation then stayed at around this level for the rest of the time period of the outcome variables (to end March 2005). The steady increase may suggest a possible time lag of two to three years between a young person claiming Income Support and then needing help with homelessness. Living on subsistence level benefits can get harder the longer a person has to do it. If these struggles correspond with a move away from a family support network towards a more 'independent' lifestyle, it is possible that a young person could find themselves facing numerous life challenges, homelessness included. To summarise then, variables sexage1, sexage3 and sexage6 remained in the analysis at this point.

5.2.1.8 Drug variables

There were two variables under this heading showing correlation with the outcome variables; logdrugs1 (people in contact with the drug treatment agency whose main drug was heroin) and drugs6 (total number of drug users in contact with the drug treatment agency). The data for these variables were dated late in the time period under study, with the data referring to contacts for the year 2003. Assessing correlation over the following few years was therefore not possible within the scope of this research and it was only possible to look at correlation for a year after the data. Nevertheless, both variables showed a good level of correlation for the year after the data with correlation slightly higher for logdrugs1 (heroin use). There seemed to be a stronger relationship with the outcome variables for logdrugs1 than with drugs6. Whilst logdrugs1 is a subset of drugs6, drugs6 also encompasses a number of other variables around drug use which have been shown by the scatterplots to have no obvious relationship with the outcome variables. To avoid effectively watering down the level of correlation by the indirect inclusion of these variables where no relationship exists, it was decided to discard drugs6 and use logdrugs1 in further analysis. Only one variable from this category would therefore proceed to the next stage of analysis; variable drugs1.

5.2.1.9 Deinstitutionalisation

5.2.1.9.1 Leaving Social Services Care

There were nine potential predictor variables under this category (deinst2 – deinst10), all at county level. However, in fact there were just three potential measures, covering different time periods. As data for different time periods was readily available it was included as a check on the reliability of the measures.

The first two variables (deinst2 & 3) related to the number of children in need receiving services at specific points in time in 2000 and 2001 respectively. For the period of a couple of years following the date of the data, both of these variables showed a strong relation with the outcome variables, peaking towards the end of 2003. Whilst the relationship remained fairly strong after this time, there were an increasing number of outliers highlighted by the scatterplots which would suggest the data became less reliable as a potential indicator over time. Only one of these variables would be included in the multivariate analysis. In deciding whether deinst2 or 3 should be included in further analysis, there appeared to be no obvious reason for inclusion of one rather than the other. The decision was therefore made on the basis of simplicity. These variables potentially indicated a two year delay before reaching maximum correlation with the outcome variable. The majority of the remaining predictor variables were based on data as at end March or April 2001 and it was later decided to use year end figures for 2003 as the dependent variable (see 5.2.4 below). It therefore made sense to include deinst3 in further analysis, as using data from the same period as the other possible predictor variables kept things simple.

Deinst4 and deinst5 related to the number of children ceasing to be looked after in 2000 and 2001 respectively. Again, the pattern was very much like that of deinst2 & 3; with both variables being consistently correlated with the outcome variables. Both variables showed a very gradual increase in correlation with the outcome variables for two to three years after the date of the data. One explanation for this slight time lag could be that it might take time for arrangements or behaviour instilled by social services to break down. It is not unreasonable to assume that Social Services would not discharge a family from their services if it was felt that this family needed ongoing support to sustain things. Homelessness immediately after discharge would hopefully therefore be rare. Only one of these variables would potentially be included in the next stage of the analysis and based on the same argument as above, it was decided to use deinst5.

Variables deinst6, 7, 8, 9 & 10 all related to the numbers of young people leaving the care system between 2000 and 2004. The patterns of correlation for all of these variables were very similar, with correlation figures peaking within the first year after the date of the data in each case. This suggested good reliability of the measure. After peaking within a year, correlation then showed a slight but gradual decline over the following years but correlation still remained high for all variables over the time period studied. Again, it was only appropriate to include one of these variables in further analysis of the data. In order to maximise possible correlation with the outcome variable to be used (see below), whilst at the same time maintaining simplicity within the model, the choice was narrowed to deinst7 (young people who ceased to be looked after in year ending 31/3/2001) for the same reasons as detailed above. To summarise then, under this subsection, only variables deinst3, deinst5 and deinst7 would remain in the analysis from this point forward.

5.2.1.9.2 Leaving prison

All four potential predictor variables appeared to show a positive linear relationship with the outcome variables from their scatterplots. The scatterplots suggested that the weakest relationship was with logdeinst16 (number of burglaries from a dwelling) where the data consistently showed a number of significant outliers. For the variable logdeinst15 (violence against the person offences) the relationship started off strong but seemed to have an increasing number of outliers from the middle of 2002. Variable logdeinst17 (theft of a motor vehicle offences) appeared pretty strong until 2004 when it started to dissipate a little. Variable logdeinst18 (theft from a motor vehicle offences) appeared to be the strongest variable from the scatterplots, remaining consistently positively related to the outcome variables over the whole time period investigated. The correlation between theft from a vehicle and homelessness decisions, may be an indication of homelessness being linked to opportunistic, petty crime, perhaps being motivated by extreme poverty or desperation but again this is just unsubstantiated speculation. These associations between crime and homelessness were further evidenced by the correlation statistics which were very high for all of these variables. The correlation statistics did point to a general trend of these variables correlating most highly with the outcome variables almost three years after the date of the data. These variables were included as potential indicators of the numbers of people leaving prison on the basis that shorter sentences have a bigger impact on homelessness and these offences would normally attract shorter sentences. It is likely that there would be some time period between the offence being recorded, the case coming to court, a possible sentence being served and the perpetrator being released potentially homeless. It is suggested that the generally high correlation levels and the repeated upward trend in correlation for the three years following the offence goes some way to suggest these variables might be reliable measures and, to some extent, justifies their representation of this subcategory of deinstitutionalisation. However, all of these variables demonstrated multicollinearity with each other and therefore needed further consideration. Therefore, at this stage in the research all four variables; deinst15, deinst16, deinst17 and deinst18 remained in the analysis.

5.2.1.9.3 Leaving mental health care

Although there were four possible variables (two different variables at two different points in time) at county level for this category; deinst11, 12, 13 & 14, they all related to guardianship under the Mental Health Act 1983 and none of them showed any relationship with homelessness decisions in the scatterplots. They were subsequently excluded from further analysis. Although this meant that there were no variables remaining in this subcategory, it is important to note that there was a potential overlap with the poor health category, with poorhealth3 in particular detailing the number of mental health discharges. This variable did show significant correlation with the outcome variables and could therefore potentially be better used to represent this subcategory. To summarise the position; no variables under this subcategory would continue to be included in the analysis.

5.2.1.9.4 Leaving the armed forces

The only variable at local authority level under this category (deinst1 - number of people in the armed forces) did not show any obvious relationship with any of the outcome variables. Not only was this the only variable under this category at local authority level but it was unfortunately, the only variable under the subset of leaving the armed forces. The lack of any relationship with the outcome variables meant that there would be no variables included in further analysis and no variables representing this potential precursor to homelessness in any final model.

5.2.1.10 Migration variables

Of the three possible predictor variables in the migration category, only migration2 (lived elsewhere within the associated area within the last twelve months) showed a positive linear relationship with the outcome variables. This may have had something to do with the legislative requirement of local connection which needs to be satisfied before full assistance under the homelessness provisions is available. It is interesting to note that whilst this variable showed a definite positive linear relationship with all outcome variables, a similar variable, logmigration3 (lived elsewhere outside of the associated area within the last twelve months) showed no relationship with the outcome variables. One hypothesis or possible explanation for such a difference might be that those applicants perceived as "outsiders" by a Local Authority may not get through initial screening or first contact with the homelessness office of the local council and may instead be sent away to seek assistance elsewhere. Another hypothesis might be that those people who have moved into the area from a significant distance away may have done so in a more planned or independent fashion and may be less likely to require social assistance with their housing; in short there is no clear explanation for this difference. The correlation statistics for migration2 were strong, peaking at the end of March 2003, two years after the date of the data. After this point, correlation gradually dropped off in the following two years. Only migration2 was therefore considered in further analysis.

5.2.2 Multicollinearity between variables within the same category

As highlighted above, there were a number of variables that demonstrated multicollinearity both within categories and between categories. A summary of the correlation statistics for the predictor variables that demonstrated high collinearity with each other can be seen at **Figure 27**. These issues are examined and discussed in more detail below.

5.2.2.1 Multicollinearity within the category of General demographic variables

All of the general demographic variables that showed a strong relationship with the outcome variables unfortunately (but not surprisingly) also all showed a strong relationship with each other. Fortunately, under this category, the variables gen3 (number of males) and gen4 (number of females) are encompassed in gen2 (total population) and it is not therefore unreasonable to consider using gen2 alone to represent this category in further analysis. The general demographic category was therefore represented by just gen2 from this point in the analysis.

5.2.2.2 Multicollinearity within the category of Sexage variables

These four variables, sexage1 (number of 16 and 17 year olds in the population), sexage3 and sexage 4 (number of under 18 conceptions for two different time periods) and sexage6 (number of income support claimants under the age of 20) all showed high collinearity with each other. This is not surprising as the numbers bear constant relationships to total population. As stated above in **2.7,** the qualitative evidence in the literature highlights that age as well as sex can be key influences on whether a person becomes homeless (Somerville, 1998; Anderson and Rayens, 2004; Randall and Brown, 1999). It was therefore important to try to include and address these issues in this quantitative research. However, the search for appropriate data for these potential variables (as outlined in **4.2.6.7**. earlier) proved problematic. Whilst it was anticipated that the indicators selected were likely to demonstrate collinearity with each other as well as other indicators used in the analysis as a result of their relationship to the total population, there were no other more suitable alternatives available. It was therefore decided to initially include the indicators in the analysis with the awareness that it would be necessary to deal with the issues of collinearity as they presented. In an attempt to deal with the issue of multicollinearity within this category, sexage4 was excluded from further analysis as described above (**5.2.1.7**). This left three variables all being highly correlated with each other. The variable logsexage1 (total number of 16 and 17 year olds in the population as at April 2001) was also highly correlated with the general variable Gen2 (total population). As Gen2 would encompass logsexage1 one option was to consider discarding logsexage1 from further analysis and this action was taken. Correlation was particularly high between logSexage3 (under 18 conceptions 1998-2000) and logsexage6 (number of income support claimants under the age of 20 as at August 2001). This is no real surprise as young people with young children are one of the main categories of applicants likely to claim Income Support. The strength of correlation with the outcome variables was very similar for both of these variables. It was therefore necessary to decide which variable would be most appropriate to include in the multivariate analysis as including both would certainly introduce bias into the model. Logsexage6 would be a subset of logpoverty2 which was also still in the running. On this basis it was decided to drop logsexage6 from further analysis, leaving just logsexage3 in this category. Only variable sexage3 was therefore considered in the analysis that followed.

5.2.2.3 Multicollinearity within the category of Poverty variables

The four poverty variables potentially remaining in the running after initial bivariate analysis were all correlated with each other. In particular, logpoverty2 (total number of income support claimants 2001) was extremely highly correlated with both logpoverty3 (Income Based Job Seekers Allowance claimants 2000) and logpoverty5 (number who have never worked or are long term unemployed 2001). Further, logpoverty3 and logpoverty5 were also highly correlated with each other. This clearly pointed to the issue of multicollinearity which was potentially destabilising for a potential model. Poverty6 was the only variable amongst the four which did not show unacceptable levels of correlation with the other variables in this category. Poverty2 and poverty3 are mutually exclusive variables - a claimant would either receive Income Support or Income-

Based Job Seekers Allowance, not both. Taken together over the same time period, these variables would account for the large majority of people of working age receiving income-based, subsistence level benefit due to not be able to find or undertake paid employment. Logpoverty5 and poverty6 were amalgamated variables looking at economic inactivity of the working age population. It would therefore seem reasonable to suggest that logpoverty5 and poverty6 would essentially be subsets of the other poverty indicators. Additionally, including an amalgamated variable introduces additional steps for end users of any predictive model and consequently the possibility of additional error and the concern was to keep things as simple as possible. For these reasons, logpoverty5 & poverty6 were excluded from the further analysis. This left variables poverty2 and poverty3 to be considered in further analysis.

5.2.2.4 Multicollinearity within the category of Deinstitutionalisation variables

5.2.2.4.1 Leaving social services care

Three possible variables remained under this subcategory; deinst3, 5 &7. Deinst5 (number of children ceasing to be looked after during year ending 31/03/2001) and deinst7 (number of young people ceasing to be looked after during year ending 31/03/2001) showed obvious collinearity with each other. Both variables could not therefore go forward for multivariate testing. Deinst5 (number of children in need receiving services in a typical week in 2001) was also highly correlated with the other variables in this category but not quite sufficiently to warrant automatic exclusion on the grounds of multicollinearity. In considering which of these variables would be the best indicator to go forward under this category, each one was looked at more closely. The scatterplots showed that deinst3 had much less homogenity of variance than the other two variables. Not only were there outliers in the data but the pattern of these outliers was not consistent. Based on the criteria of homogeneity of variance being a requirement for parametric testing, deinst3 was least favoured for inclusion. Both variables deinst5 and 7 did highlight some outliers, but considerably fewer than deinst3. Partial correlation calculations were therefore undertaken to try to clarify matters further. Whilst deinst3 (children in need receiving services in a typical week in 2001) and deinst5 (children ceasing to be looked after during the year ending 31st March 2001) each shared a good proportion of the variance in the outcome variable (55% and 48% respectively), these figures were significantly reduced when the effects of deinst7 were controlled for, reducing the coefficients to 10% and 2% respectively. However, a similar picture presented when the effects of these variables were controlled for in relation to the variance in the outcome variable demonstrated by deinst7. The percentage of the shared variance for deinst7 dropped from 51% to 6.4% when controlling for deinst3 and to 8.3% when controlling for deinst5. It was therefore evident that these variables were clearly interrelated and it was consequently even more necessary to choose between them for the purposes of further analysis in relation to homelessness. Of the three remaining correlating variables, deinst7 demonstrated the greatest visible homogenity of variance and was therefore selected for multivariate analysis.

5.2.2.4.2 Leaving prison

All of the four variables under the subcategory of leaving prison correlated highly with each other. They also correlated highly with variables in other categories. Logdeinst15 & 17 (violence against a person and theft of a motor car) showed unacceptable levels of correlation with ten of the seventeen other variables at Local Authority level and logdeinst16 (burglary from a dwelling) had collinearity with eleven of the other variables. Whilst logdeinst18 (theft from a motor vehicle) showed very high correlation with seven of the other variables, three of these variables were the ones in this category and a fourth was a variable that was subsequently discarded from further analysis. As the patterns of correlation with the outcome variables were very similar for all the variables under this subheading and there was no strong evidence to support or refute the exclusion of one variable over another, it was decided to exclude logdeinst15, 16 & 17 from further analysis on the basis that keeping logdeinst18 would minimise the incidences of multicollinearity generated by the variables in this subcategory. Variable deinst18 was therefore selected for further analysis.

5.2.2.5 Possible predictor variables available for further analysis

So, to summarise the position so far: the table on the following page details the predictor variables in each category that remained after initial screening using univariate and bivariate analysis including any issue of possible time lag with homelessness and a subjective assessment of their consistency of correlation over the time period.

Category	Variable	Level	Potential time lag?	Consistently highly correlated
General	Gen2	LA	Not obvious	Yes – 4 years
Housing	None	-	n/a	n/a
Poor Health	logoorhealth1	LA	Possibly 2-3 years	Yes - 4 years
Ethnicity	logethnicity2	LA	Not obvious	Yes – 3 years
Poverty	Logpoverty2	LA	Possibly 2-3 years	Yes – 3-4 years
	Logpoverty3	LA	Possibly 3 years	Yes – 4 years
Relationship breakdown	logrelationship1	LA	Possibly 2-3 years	Yes – 4years
	Relationship5	LA	Not obvious	Yes – 4 years
Sex and age	logsexage3	LA	Possibly 2-3 years	Yes – 4 years
Drugs	logdrugs1	County	Not obvious	Min. 1 year
Deinstitutionalisation armed forces	None	-	n/a	n/a
Deinstitutionalisation Social services care	Deinst7	County	Maybe 0-1 year	Yes – 4 years
Deinstitutionalisation mental health care	logpoorhealth3	PCT	Not obvious	Yes - 2 years Min
Deinstitutionalisation leaving prison	logdeinst18	LA	Possibly 3 years	Yes – 4 years
Migration	Migration2	LA	Not obvious	Yes – 3 years

Table 5.1 – Summary of remaining predictor variables in each category after initial filtering

From an original set of 69 possible predictor variables, the bivariate analysis initially identified 37 as demonstrating a positive linear relationship with the outcome variables. After generating correlation statistics and considering the issues of multicollinearity within the various categories, the number of predictor variables for possible use in a regression model was reduced to 13, as detailed in the table above. Most of the original categories were represented in some way but notably, there were no possible predictor variables remaining under the categories of Housing, and Deinstitutionalisation – armed forces. This was for apparently different reasons. Although numerous possible housing variables were originally identified, none of them demonstrated a relationship with homelessness decisions. For the other category, the problem was not being able to find suitable, possible indicators in the first place. Only one possible variable was identified and this was essentially an attempt at indirect representation of the issue as no direct representation of the category could be found. This variable, representing leaving the armed forces, failed to show an association with homeless decisions. The majority of the other variables remaining after initial screening were at local authority level, with only two remaining variables at county level and one remaining variable at PCT level.

5.2.3 Multicollinearity between variables from different categories

Correlation statistics and scatterplots were generated to identify any strong associations or correlations between the remaining possible predictor variables. A summary of the scatterplots is detailed in **Figure 28** and the correlation matrices for local authority and county levels are shown in **Figure 29**. Whilst there was no sign of multi-collinearity amongst the remaining variables at county level, there was a significant level of multicollinearity amongst the remaining variables at local authority level. In particular, logpoverty2 showed obvious multicollinearity with five of the other remaining variables. Fortunately, there were two mutually exclusive variables remaining under the category of poverty which were very highly correlated with each other and although they are technically measuring different things, they are essentially indicating different aspects of the same issue – poverty. It was therefore decided to exclude logpoverty2 (income support claimants) from further analysis in an attempt to reduce the issue of multicollinearity in the multivariate analysis. Multicollinearity was nonetheless still present to some degree with all the remaining variables. It was therefore necessary to consider further exclusion of variables. This was initially undertaken on the basis of strength of correlation with the outcome variables. Of the remaining predictor variables, variable Gen2 (total population) showed the weakest correlation with the outcome variables as well as multicollinearity with two other variables in the group. It was therefore removed from the remaining group. By eliminating variables in this way, it was recognised that ultimately, part of the picture would be lost, particularly if the eliminated variables correlated highly with the outcome variables or included other (previously excluded) variables as subsets; for example, logPoverty2 accounted in part for the information contained in logPoverty5 and Poverty6 and Gen2 included variables Gen3 & 4 as subsets. However, these issues are a recognised limitation of the process and when dealing with complex, multidimensional issues, the effect of aggregating and simplifying is to reduce the complexity at the expense of minor issues, which are over-ridden by weightier ones (Spiker, 2004). Despite these eliminations, four of the remaining variables still showed obvious multicollinearity with each other and this posed a problem for the next stage of the analysis.

Additionally, the categories of poor health and relationship breakdown still had two variables remaining while the other categories had only one, or in the case of housing or leaving the armed forces, there were none. This raised the question of whether weighting might be appropriate. Unfortunately, at this point in the research, there was no way of knowing whether a particular variable or category had more or less of an influence on the dependent variable than another variable or category. It was therefore extremely difficult to assign weights to the remaining variables. The two poor health variables remaining were technically no longer being considered under the same category, as logpoorhealth3 was representing the subcategory of deinstitutionalisation; leaving mental health care. Further, logPoorhealth3 only became relevant at PCT level. Any potential bias or conflict suspected by the inclusion of two poor health variables could therefore be managed during any between-level modelling if necessary. The remaining variables under the category of relationship breakdown were representing very different issues; separation and lack of religion and were not obviously highly correlated with each other. There was arguably therefore no reason that the power of either of these variables should have been reduced by a weighting process just because they had been categorised together for ease of reference. Eleven potential predictor variables remained in the analysis at this point in the analysis.

5.2.4 Dependent variable selection and the issue of time lag

The bivariate correlation was originally undertaken for all predictor variables against all the outcome variables. This served two purposes: Firstly it helped to identify whether correlation with a particular predictor variable was higher at different points within the time period examined, suggesting the possibility of time lag between the experience highlighted by the predictor variable and homelessness. Secondly, the process highlighted any differences in correlation between the different types of outcome variables (the total number of decisions or the number of full duty decisions), over the 4 – 5 year period. The correlation coefficients for the remaining variables were plotted on a time line against the dependent variables to identify any peaks and trends and these charts can be seen at **Figure 30**. Whilst all the remaining 11 predictor variables showed consistently high correlation with the outcome variables for the whole period studied, there were some obvious trends in correlation potentially indicating a possible time lag between the experience detailed in the predictor variable and homelessness. As can be seen from the summary table above **(5.2.2.5, table 5.1)**, where such a pattern was evident, the delay before peak of correlation with the outcome variable was usually between two and three years. The majority of the variables were based on data as at end March or April 2001. To take account of this possible time delay issue, it would seem appropriate that the dependent variables for use with further exploratory analysis at multivariate level should be the total number of homeless decisions in 2003 (logT2003d) hereinafter referred to as 'total decisions' and total decisions made in 2003 which led to acceptance of the full duty to assist (logT2003fd) hereinafter referred to as 'full duty decisions'.

5.2.5 Partial correlation

5.2.5.1 Local Authority level predictor variables

Partial correlation coefficients were run for all the remaining variables controlling for the effects of each other remaining variables. This process was done for both of the possible dependent variables to check for any significant variation in the partial correlation figures. Although all of the individual predictor variables demonstrated strong correlation with the outcome variables, this changed quite dramatically for some variables when partial correlation analysis was run. Whilst the correlations remained significant, there was a very large drop in the percentage of variance in outcome variables for some of the predictor variables. The variable that had the biggest effect on all the other remaining variables was logelationship1 which accounted for the whole variance in some of the other variables. **Figure 31** shows the effects of partial correlation of each remaining variable (in each column) with full duty decisions, controlled for the effects of the other variables (in each row). Looking at migration2 for example; on the face of things, this variable shared 44.6% of the variance in full duty decisions. However, when partial correlation was carried out controlling for each of the other variables, this share of the variance in the outcome variable reduced to a maximum of 18% (when controlling for logpoverty3; Income Based JSA claimants) and reduced to practically nothing when the effects of logrelationship1 (number of people separated) were controlled. Logsexage3 (under 18 conceptions) also had a strong effect on the other remaining variables, also suggesting the amount of unique correlation between the remaining predictor variables and the outcome variables was actually much lower than would first appear.

It would appear that variables relationship5, logdeinst18, migration2 and, to a lesser extent, logethnicity2 and logpoorhealth1 actually make a negligible unique contribution to the variance in homelessness decisions resulting in full duty being accepted if the variable logrelationship1 is taken into account. Relationship5, logdeinst18 and migration2 would therefore all be dropped from any further analysis that included logrelationship1. These exclusions left a total of eight potential predictor variables.

5.2.5.2 County level predictor variables

When partial correlation was undertaken for the two remaining variables at county level, both variables maintained a good level of unique variance on the outcome variables when the effects of the other variable were controlled. Deinst7 initially shared 46.4% of the variance of the outcome variable and this was reduced to 31% when the effects of logdrugs1 were controlled. Logdrugs1 initially showed a 41% share of the variance on the outcome variable with the unique contribution to variance showing as 23% when the effects of deinst7 were controlled. These figures did not suggest further reduction of variables was necessary at this level.

5.2.6 Summary of bivariate analysis

Bivariate analysis showed strong correlations between a number of the predictor variables and the outcome variables. These correlations appeared to remain strong over time and some showed a perceptible increase in correlation over two to three years, suggesting a possible issue of time lag between experiencing the situation described in the predictor variables and needing help with homelessness. The strong correlations between the predictor variables and the outcome variables are supported by the theoretical knowledge of these issues being possible precedents to homelessness and are arguably therefore non-spurious. Perhaps surprisingly, the only category that failed to demonstrate a consistent relationship with homelessness decisions was housing; adding further weight to the argument that homelessness is not primarily a housing issue. All the other categories showed clear correlations with the outcome variables. However, partial correlation calculations highlighted that there was one variable that appeared to be predominant at Local Authority level: Not only did logrelationship1 show the highest correlation with the outcome variables of all the remaining variables but it also suggested that the large majority of the variance in the outcome variables for a number of the remaining predictor variables was common variance and not unique to those predictor variables. This has significant implications for a potential model. The findings from the partial correlation analysis led to a further three variables being dropped from possible multivariate analysis, leaving five remaining variables at Local Authority level, two at county level an one at PCT. This total of eight possible remaining variables fell within the parameters highlighted in the previous chapter (see **4.2.12.1**) and summary details are included in the table below.

Variable name	Summary variable description
Poorhealth1	Number of people with limiting long term illness
Ethnicity2	Number of population of mixed race
Relationship1	Number of people separated but still legally married
Sexage3	Number of under 18 conceptions
Drugs1	Number of people in contact with the drug treatment agency using heroin as their main drug
Deinst7	Number of young people who ceased to be looked after by Social Services
Poorhealth3	Number of mental illness discharges from hospital
Poverty3	Number of claimants for Income Based Job Seekers Allowance

Table 5.2 – Brief summary of possible predictor variables remaining after bivariate analysis.

5.3 Multivariate analysis

5.3.1 Regression analysis using all remaining variables

Once the possible predictor variables had been reduced to an acceptable number, regression analysis was carried out using all of the remaining predictor variables at Local Authority level. The analysis was run twice; once for full duty decisions and then again for total decisions. The initial regression equation was therefore as follows:

Dependent variable = b_0 + b_1 logsexage3 + b_2 logpoorhealth1 + b_3 logrelationship1 + b_4 logpoverty3 + b_5 logethnicity2

The variables were entered using a blockwise method with logsexage3 and logpoorhealth1 being entered first, logrelationship1 and logpoverty3 being entered secondly and logethnicity2 being entered thirdly. As can be seen below, whilst on the face of things, the initial models looked strong, more detailed analysis highlighted a significant problem with multicollinearity making the models highly unstable. Brief summary tables for the key aspects of the regression analyses are shown below. More details for the models can be seen at **Figure 32** for full duty decisions and at **Figure 33** for total decisions. The column for coefficient confidence intervals contains either a √, which demonstrates the confidence intervals do not cross zero and are relatively small or a X, which indicates that the confidence intervals for the coefficients either cross zero or are unacceptably large. The Max. VIF column details the maximum VIF figure for any of the variables entered at that stage of the model.

Models produced for full duty decisions	R^2	F-ratio	Coefficient confidence intervals	Max. VIF
First level entry model	.737	398.425	√	5.477
Second level entry model	.780	27.767	X	12.193
Third level entry model	.780	.461	X	20.079

Table 5.3 – Brief summary of key aspects of regression for models produced using blockwise entry with all remaining variables and outcome variable logT2003fd

Models produced for total decisions	R^2	F-ratio	Coefficient confidence intervals	Max. VIF
First level entry model	.721	370.218	X	5.5
Second level entry model	.750	212.705	X	12.257
Third level entry model	.750	169.761	X	20.049

Table 5.4 – Brief summary of key aspects of regression for models produced using blockwise entry with all remaining variables and outcome variable logT2003d

5.3.1.1 Results of the regression model using all remaining variables

In assessing whether the model was successful in predicting the number of decisions on homeless applications a number of issues were considered. R^2 was the first statistic considered as this is a measure of how much of the variability in the outcome is accounted for by the various predictors. Of the two dependent variables, the figures were higher for full duty decisions. The maximum figure for R^2 was 0.780 and this arose after the second set of predictor variables were entered into the equation. Adding the third entry variable did not improve the figure. The figures for the adjusted R^2 were very close to those for R^2 which indicated that the model generalises to the population well. The assumption of independent errors appeared to have been satisfied.

5.3.1.2 Analysis of variance

The results of analysis of variance (ANOVA) test whether the model is significantly better at predicting the outcome than using the mean. The F-ratio shows the ratio of the improvement in prediction which results from fitting the model, relative to the inaccuracy that still exists in the model (Field, 2005). If the improvement due to fitting the regression model is much greater than the inaccuracy within the model the value of F should be greater than 1. If this isn't the case, it suggests that the null hypothesis should be accepted, namely that the model does not explain or predict data better than the mean. The F ratio was very high for both dependent variables although again, higher with full duty decisions. The F ratio was 398.425 after the first variable entry and then dropped to 250.216 and then 200.123 after the second and third staged entry of variables. Whilst all these F ratios were highly significant ($p<0.001$) the initial model (first stage entry variables) appeared to be the best predictor of the outcome variable. The best regression equation obtained from this process would therefore be:

Dependent variable = b_0 + b_1 logsexage3 + b_2 logpoorhealth1
(Under 18 conceptions) (limiting long term illness)

5.3.1.3 Coefficients

Looking further at the regression information however, the coefficients table indicates a different picture. Whilst the pattern of coefficients for each of the dependent variables was very similar, the results digressed from that indicated by the ANOVA testing. For both dependent variables, the predictor variables logpoorhealth1 and logsexage3 both showed positive b and beta values, indicating that the variables had a positive relationship with the dependent variable at first stage variable entry of the model. The associated t-tests for the b values were also significant ($p<0.05$) for the regression run for full duty decisions but significance was not demonstrated by logpoorhealth1 with total decisions. At the second stage variable entry, the b value and Beta value for logpoorhealth1 showed a negative relationship with the dependent variable and a t-test that was not significant at $p<0.05$. Logsexage3 also failed to demonstrate a t-test significant at $p<0.05$ when regressed on total decisions at the second variable entry stage. After the third entry of variables, the b and Beta values for logpoorhealth1 remained negative and the t-test associated with these values again failed to showed significance at $p<0.05$. In addition, the t-test associated with the b value for logsexage3 also failed to demonstrate significance at $p<0.05$ when regressed against full duty decisions. Further, the b and Beta values were negative for logethnicity2 (the variable for mixed race) with both dependent variables and the associated t-test was not significant ($p<0.05$) in either case. These figures suggest that the effect of two variables included for the first stage entry into the model is significantly changed when the other variables are included in the equation and the first variables may therefore not be the best predictors of the outcome variable after all. Also, from previous analysis, it was clear that all the remaining variables had a positive relationship with the dependent variables; when the predictor variables increased, so did the number of decisions on homelessness. This is not what was being indicated by the regression model and the validity of the model was therefore questioned. This concern about the model was confirmed when the confidence intervals were considered. The confidence levels for variables logpoorhealth1, logsexage3 and logethnicity2 all crossed zero, indicating a very bad model. This was further confirmed by the part correlation figures that represent the relationships between each predictor variable and the outcome variable, controlling for the effect that the other variables have on the outcome variable; the unique relationship that each predictor has with the outcome variable. All variables showed a very small part correlation figure with the exception of logsexage3. This variable showed a reasonable part correlation at the first stage of variable entry (0.310) when it was only competing with one other variable but the part correlation figure then dropped to 0.083 at the second stage of variable entry and to 0.079 at the third stage (for total decisions).

5.3.1.4 Multicollinearity within the model

These figures suggested significant multicollinearity and instability of the model and this was confirmed by the tolerance and VIF statistics shown in the regression analysis. Given the complexity of the social world, the suggestion of multicollinearity is no surprise. A serious problem is indicated if the tolerance figures are below 0.1 and a potential problem is indicated in tolerance is below

0.2 (Menard, 1995). Further, if the VIF is greater than 10 there is cause for concern and if the average VIF is substantially greater than 1 the regression may by biased (Bowerman & O'Connell, 1990). At first variable entry stage, the tolerance is 0.182 for total decisions and 0.183 for full duty decisions with the VIF figures being 5.5 and 5.477 respectively. This suggests a potential problem. The situation is exacerbated further on second stage and third stage variable entry with tolerance figures for some predictor variables falling below 0.1 and VIF statistics greater than 10 for both dependent variables. Throughout all stages with both dependent variables the average VIF figure is substantially greater than 1. This concern was further evidenced by looking at the statistics for the excluded variables after first and second stage of variable entry; the t-tests associated with the beta values do appear to be significant at $p<0.01$ for all predictor variables regressed on both dependent variables, except for the mixed race variable (logethnicity2) regressed on total decisions. However, the tolerance and VIF statistics are again a cause for concern. Finally, the collinearity diagnostics show that some of the eigenvalues are much larger than the others, suggesting that the cross-products matrix is ill-conditioned and that small changes in the predictors can greatly affect the solutions of the regression parameters and lead to significant inaccuracies in the regression model. The condition index verifies these findings with very large numbers at every stage of the variable entry into the model for both dependent variables. The condition index represents the square root of the ratio of the largest eigenvalue to the eigenvalue of interest and larger condition indices indicate issues of collinearity. This is further detailed by looking at the variance proportions which clearly show a number of predictor variables as having high proportions on the same small eigenvalue; the variables for limiting long term illness, separated and mixed race; logpoorhealth1, logrelationship1 and logethnicity2, all have high proportions on the same eigenvalue, as do, to a lesser extent, the variables for under 18 conceptions and Income Based JSA claimants; logsexage3 and logpoverty3. This indicates that the variances of their regression coefficients are dependent on each other and confirms that there is a significant problem with multicollinearity. This is addressed at **5.3.2** below.

5.3.1.5 Extreme cases

Although the regression analysis identified significant collinearity between variables, it also produced casewise diagnostics to help identify extreme cases. In this analysis 288 cases were included in the regression analysis. It would be expected that 95% of cases would have standardized residuals within about ± 2 so it is reasonable to expect about 14 or 15 cases (5%) to have standardized residuals outside of these limits. For total decisions there are 15 cases outside of these limits and for full duty decisions there are 12 cases. In addition, it would be expected that 99% of cases lie within ±2.5 and so it would be expected that only 1% of cases lies outside of these limits. For each of the dependent variables three cases (1%) lie outside of these limits. Although the sample appears to conform to what would be expected for a fairly accurate model it highlights that there are three cases (76,121 and 145) that should be investigated further as their standard residuals were greater than three. Given the inaccuracy of the model due to the issues of multicollinearity, investigation into outliers was not undertaken at this time as a more reliable and valid model may point to different or additional outliers that need investigation.

5.3.1.6 Checking assumptions

Assessing the plots included in the regression analysis, the plot of standardised residual values against standardised predicted values showed random distribution and confirmed that the assumptions of linearity and homoscedasticity had been met. The histogram and the normality plot for the residuals both indicate normal distribution for both dependent variables. The assumptions of the model seen to have therefore been met and so, prima facie, it could be used for generalisation, however, the issue of multicollinearity is too significant to ignore and suggests the model is unreliable as it stands.

5.3.1.7 Checking the initial regression models

After the results were assessed, regression was run again using the forced entry method to see if significantly different results were produced. Not surprisingly, the analysis demonstrated a very similar pattern to that obtained using blockwise entry and the same problems of multicollinearity presented. Whilst the model appeared reasonable at the outset, with R^2 being 0.780 for full duty decisions and 0.750 for total decisions, the tolerance figures, VIF statistics, eigenvalues, the condition index, variance proportions and confidence intervals for the coefficients all pointed to the model being unreliable, unstable and consequently invalid. The issue of multicollinearity therefore needed to be addressed before the analysis could move forward.

5.3.2 Factor analysis using the remaining variables

Given the issue of multicollinearity between the remaining five variables at Local Authority level, factor analysis was undertaken to try to reduce the number of variables and eliminate the problem. A summary of the key aspects of the factor analysis is shown in the table below. The detailed results of the factor analysis can be seen in **Figure 34** and are discussed below.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.803
Bartlett's Test of Sphericity		2589.596 (sig. at .001)
Variance explained		
Component	Total	% of variance
1	4.35	87.007
2	0.408	8.17
3	0.128	2.569
4	0.08	1.608
5	0.032	0.646

Table 5.5 Brief summary of key aspects of factor analysis using all remaining variables

The determinant of the R-matrix was 0.001 and this is obviously greater than the required level of 0.00001. Whilst this provides some reassurance on the issue of high collinearity, the correlation matrix did contain a number of coefficients above 0.9 sustaining concern on this issue. Logsexage3 was the worst offender, having three out of four correlations falling into this category. All correlation in the matrix was significant at $p<0.01$ (one-tailed). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was close to 1, indicating that the pattern of correlations were relatively compact and so factor analysis should yield distinct and reliable factors. The Bartlett's test was significant which confirmed that the R-matrix was not an identity matrix and that there were some relationships between the variables. Factor analysis therefore seemed to be appropriate. The diagonal elements of the anti-image correlation matrix were all above 0.5 however the off-diagonal elements were not particularly small which raised questions over the sampling adequacy for the purposes of this factor analysis.

The table of communalities showed high levels of common variance within all of the variables included in the analysis and only one factor was extracted. Rotation to improve interpretability was therefore neither necessary nor possible. The one factor had an eigenvalue of 4.350 and accounted for 87% of the variance. The four other possible factors were discarded because their eigenvalues were less than 0.7. In actuality, they were very much less than this figure. As the sample was larger than 200, the scree plot was also a good indicator of the number of appropriate factors to include and confirmed that view that one factor was most appropriate in this case. The component matrix highlighted that all variables loaded very highly on to the extracted factor, explaining why the factor accounted for such a large amount of the variance. In assessing the fit of this model, the reproduced correlations matrix highlights that 40% of the residuals had an absolute value greater than 0.05. Whilst this was not ideal, it was considered acceptable and the social disadvantage factor scores were therefore saved as a new variable for use in regression analysis.

As to whether this was a meaningful factor was open to discussion. It is hard to see how variables covering such a diverse range of issues could be amalgamated and viewed as a single factor in the real world. What this factor actually represented was unclear and very hard to define without using vague, unspecific terms such as "social challenges" or "social disadvantage" which did little to clarify the issue and, in fact, arguably muddied the waters still further. This is arguably an indication of the very real complexity of the issues. Sometimes linear models provide an insight into the non-linearity of the social world. These findings support the theoretical framework for understanding social exclusion and homelessness in particular (Burchardt et al, 2002, Barry, 2002). It was therefore decided to assess the strength of the model obtained using social disadvantage factor scores against the models generated by the other remaining variables in order to determine if a simpler model could provide a comparable result.

5.3.3 Simple regression

As only one factor was generated from the process of factor analysis, simple regression was run using the social disadvantage factor scores against the two possible dependent variables and the results can be seen at **Figure 35** (full duty decisions) and **Figure 36** (total decisions). Given the statistics highlighted by the regression using the social disadvantage factor scores, it was decided to also run simple regression analysis for each of the individual predictor variables to see if the model using social disadvantage factor scores could be bettered by any one particular variable or a combination of the remaining variables. The use of simple regression was preferable to multiple regression as the process better satisfied the principle of scientific parsimony detailed below at **5.3.6**. A summary of some of key aspects of the simple regression models using social disadvantage factor scores and each of the remaining variables is shown below. Full details of the simple regression models can be found in **Figures 35** to **40.** The simple regression models using the social disadvantage factor scores and each of the independent variables are each discussed in turn below.

The tables detail the sample size used for each model produced, the value of R^2, which shows the overall goodness of fit, the Durbin-Watson statistic which tests for serial correlations between errors in each model and should be close to 2 if the assumption of independent errors is to be satisfied, the confidence intervals, the residuals and the outlying cases. The column headed 'confidence intervals' contains a '√', or a 'constant?'. As the sign of the beta value describes the direction of the relationship between the predictor and the outcome variables, confidence intervals that crossed zero generally indicated a very unreliable model. A '√' indicates that the confidence intervals for the regression coefficient were small and did not cross zero. A 'constant?' indicates that whilst the intervals for the beta coefficient were acceptable, the confidence intervals for the value of the constant were questionable, either because they crossed zero or because they were particularly large. The column headed 'residuals' contains a '√', or 'x''. A '√' indicates that, after considering the histogram and normal probability plot of the residuals, the model residuals were considered to be normally distributed and homoscedastic. A 'x' indicates that the residuals of the model did not satisfy these requirements.

Independent variable	Sample size	Value of R^2	Durbin-Watson	Confidence intervals	Residuals
Social disadvantage factor scores	288	.763	1.886	√	√
Logpoorhealth1	289	.683	1.734	√	√
Logsexage3	288	.731	1.827	√	√
Logethnicity2	289	.552	1.712	√	√
Logrelationship1	289	.769	2.031	√	√
Logpoverty3	288	.673	1.725	√	√

Table 5.6 Brief summary of key aspects of simple regression models using social disadvantage factor scores and each of the remaining variables with outcome variable full duty decisions

Independent variable	Sample size	Value of R^2	Durbin-Watson	Confidence intervals	Residuals
Social disadvantage factor scores	289	.73	1.723	√	√
Logpoorhealth1	290	.651	1.627	√	√
Logsexage3	288	.731	1.827	Constant?	√
Logethnicity2	290	.5	1.6	√	√
Logrelationship1	290	.714	1.699	√	√
Logpoverty3	289	.671	1.736	√	√

Table 5.7 Brief summary of key aspects of simple regression models using social disadvantage factor scores and each of the remaining variables with outcome variable total decisions

5.3.3.1 Simple regression just using Social disadvantage factor scores

Regression analysis using the social disadvantage factor scores produced a model with $R^2 = 0.763$ for full duty decisions and 0.73 for total decisions, with the adjusted R^2 being very close to the figure for R^2 in both cases. The Durbin-Watson figures were close to 2 for the analysis for both of the dependent variables suggesting independence of the errors and obviously, with only one variable there was no issue of collinearity. Looking at the analysis of variance, the F ratio was large and significant at $p<0.001$. The t-tests associated with the b and beta values were also significant at $p<0.001$ for both dependent variables. The 95% confidence intervals for B were tight and only ten cases fell outside ±2 standard deviations for full duty decisions and twelve for total decisions which is lower than the 5% expected in both cases. The number of cases that fell outside ±2.5 standard deviations was five for both dependent variables which represented 1.7% of cases. Six cases were identified as outliers that would benefit from further investigation. The histogram, normality QQ plot and the scatterplot for the standardised residuals indicated normal distribution.

The model produced using the social disadvantage factor was one of the strongest models with an R^2 value explaining either 73% or 76% of the variance in the outcome depending on which outcome variable was used in the modelling process. As highlighted in Chapter 2, there is a plethora of research supporting the links between homelessness and the variables encompassed in this social disadvantage factor score: Relationship breakdown (e.g. ODPM, 2003c; Crane and Warnes, 2000; Burrows, 1998), mixed race (e.g. Edgar, Doherty and Meert, 2004; Shelter, 2004e; ODPM, 2005b), limiting long term illness (e.g. Blaire and Wrate, 1997; Kisor and Kendal-Wilson, 2002; Taylor, 2008), under 18 conceptions (DTLR, 2002b) and receipt of Income Based Job Seekers Allowance, a means tested benefit (e.g. Foord, Palmer and Simpson, 1998; Wong, 1997; Mojtabai, 2005).

5.3.3.2 Simple regression just using Logpoorhealth1

Simple regression using the limiting long term illness variable against the two dependent variables can be seen at **Figure 37** and produced a model with R^2 = 0.683 for full duty decisions and R^2 = 0.651 for total decisions. This was slightly lower than the result produced using the social disadvantage factor scores. The Durbin-Watson statistic was reasonably close to 2, indicating independent errors, and the adjusted R^2 figures were very close to R^2 in the analysis on both of the dependent variables. Again, collinearity was not an issue due to only one predictor variable being considered. Looking at the analysis of variance, the F ratio was high and significant at $p<0.001$. The coefficient results showed a t-test for the b values of the constant and the predictor variable to be significant at $p<0.001$. The confidence intervals for the value of Beta for the predictor variable and the constant were tight for both of the dependent variables. The number of cases falling outside of the expected ±2 standard deviations was well within expectations of 5% but the number falling outside of ±2.5 was again slightly higher than expected at 1.4% for full duty decisions and more so for total decisions at 1.7%. The outliers highlighted as a result of regression with this variable were almost identical to those resulting from regression with social disadvantage factor scores. The histograms and normality plots showed normal distribution of residuals, and the plot of standardized residuals against standardized predicted values showed random distribution, suggesting that the assumptions of regression had been satisfied.

The models produced using the poor health variable (limiting long term illness) produced strong models for both of the outcome variables. This is not a surprising finding. As stated above in **5.3.3.1**, (see also **2.3** earlier), there is a vast amount of research linking homelessness and poor health. Poor health is often an obstacle to employment and therefore can impede financial independence from the state. If state assistance is at subsistence level and long term poor health is experienced, poverty will be a likely consequence and evidence suggests that the risk of homelessness will inevitably increase (Phelps and Carter, 2003; May, 2000).

5.3.3.3 Simple regression just using Logsexage3

Simple regression using the variable for under 18 conceptions against the two dependent variables can be seen at **Figure 38** and produced a model with R^2 = 0.731 for full duty decisions and R^2 = 0.718 for total decisions. This was marginally less than the result produced using the social disadvantage factor scores. The Durbin-Watson statistic was still significantly close to 2 indicating independent errors and the adjusted R^2 figure was very close to R^2 in the analysis of both the dependent variables. Again, collinearity was not an issue. Looking at the analysis of variance, the F ratio is very large and significant at $p<0.001$. The coefficient results shows an insignificant t-test for the b values of the constant and, whilst the confidence intervals for Beta are reasonably tight for full duty decisions, the interval for the constant does cross zero in the regression analysis for total decisions. This is far from being a good sign of a reliable model for this dependent variable. The regression using full duty decisions provided a much more stable result. The histograms and normality plots showed normal distribution of residuals and the outliers highlighted were within expected parameters. The plot of standardized residuals against standardized predicted values showed random distribution which was reassuring. There were five cases highlighted as more extreme outliers.

Again, there is supporting evidence in the literature for this indicator being correlated with homelessness (DTLR, 2002b) however the model was not as stable as some of the other simple regression modelling detailed in this chapter.

5.3.3.4 Simple regression just using Logethnicity2

Simple regression using the mixed race variable against the two dependent variables can be seen at **Figure 39** and produced a model with $R^2 = 0.552$ for full duty decisions and $R^2 = 0.500$ for total decisions. This was significantly less than the result produced using the social disadvantage factor scores. The Durbin-Watson statistics were not as close to 2 as the other variables but nevertheless indicated independent errors. The adjusted R^2 figure was very close to R^2 in the analysis on both of the dependent variables. Again, collinearity was not an issue. Looking at the analysis of variance, the F ratio was large and significant at $p<0.001$ although it was much less than some of the other variables. The coefficient results shows a t-test for the b values of the constant only to be significant at $p<0.05$. Whilst the confidence intervals for the value of Beta for the predictor variable are reasonably tight for both of the dependent variables, the intervals for the constant are not quite so tight. The number of cases falling outside of the expected ±2 standard deviations was within expectations of 5% but the number falling outside of ±2.5 was higher than expected at 2.4%. Eight outliers were highlighted as a result of regression with this variable. This suggests that regression for this predictor variable against this dependent variable would be a less reliable option than some of the other models suggested. Nevertheless, the histograms and normality plots showed normal distribution of residuals and the outliers highlighted were within expected parameters. The plot of standardized residuals against standardized predicted values showed random distribution which affirmed that the assumptions of regression had been satisfied.

The fact that the ethnicity variable mixed race produced an acceptable and reliable model was an unexpected finding despite there being strong evidence in the literature to support ethnicity as a key influencing factor for homelessness (ODPM, 2005b; Carter, 1998, Daly, 1996). Whilst the models produced using this variable were not as strong as the other variables that were selected for multivariate analysis, this research would nevertheless seem to add significant quantitative support to the view that ethnicity is a key factor in determining homeless levels within an area. This will be tested further in the next chapter.

5.3.3.5 Simple regression just using Logrelationship1

Simple regression using the variable for the number of people separated against the two dependent variables can be seen at **Figure 40** and produced a model with $R^2 = 0.769$ for full duty decisions and $R^2 = 0.714$ for total decisions. For full duty decisions, this was marginally higher than the result produced using the social disadvantage factor scores. The Durbin-Watson statistic was very close to 2 (1.943) for the analysis for full duty decisions indicating independent errors. The adjusted R^2 figure was very close to R^2 in the analysis on both of the dependent variables. Again, collinearity was not an issue. Looking at the analysis of variance, the F ratio was very high and significant at $p<0.001$. Further, the coefficient results shows a t-test for the b values of the constant and the predictor variable to be significant at $p<0.001$. The confidence intervals for the value of Beta for the predictor variable and the constant are tight for both of the dependent variables. The number of cases falling outside of the expected ±2 standard deviations was within expectations of 5% but the number falling outside of ±2.5 was slightly higher than expected at 1.4% for full duty decisions and more so for total decisions at 2.1%. Nonetheless, for full duty decisions, the results were still better that those obtained for the regression using the social disadvantage factor scores. Six outliers were highlighted as a result of regression with this variable. The histograms and normality plots showed normal distribution of residuals and the plot of standardized residuals against standardized predicted values showed random distribution which was affirming that the assumptions of regression had been satisfied. This all suggested that using this predictor variable against dependent variable 'full duty decisions' would be a more reliable option than using the social disadvantage factor scores to generate a regression model.

The models created using the 'separated' variable produced R^2 values as strong as those produced by the models using the 'social disadvantage' factor. This was very encouraging as it allowed for the possibility of keeping the model simple without losing any of its strength or reliability. Whilst relationship breakdown in well documented in the literature as having causal links with homelessness (Butler, 1993, Randall and Brown, 1999, Davies, 1996) there is no automatic statutory requirement to assist with situations of homelessness arising from relationship breakdown; additional criteria have to be satisfied before there is a chance of full duty assistance being provided. There is therefore no prima facie link between the data used to indicate relationship breakdown and the figures used for the outcome variables (P1E returns – see 3.3.1.2 earlier for a fuller description), unlike the poor health variable for example which can qualify an individual for mandatory assistance and could therefore indirectly be reflected in the outcome variable figures.

5.3.3.6 Simple regression just using Logpoverty3

Simple regression using the variable for the number of claimants on Income Based JSA against the two dependent variables can be seen at **Figure 41** and produced a model with $R^2 = 0.673$ for full duty decisions and $R^2 = 0.671$ for total decisions. This was slightly lower than the result produced using the social disadvantage factor scores. The Durbin-Watson statistics were reasonably close to 2, indicating independent errors. The adjusted R^2 figure was very close to R^2 in the results for both of the dependent variables. Collinearity was not an issue. Looking at the analysis of variance, the F ratio was high and significant at $p<0.001$. The coefficient results showed a t-test for the b values of the predictor variable to be significant at $p<0.001$ but the t-test was not significant for the b value of the constant with full duty decisions and was only significant at $p<0.05$ for the regression analysis for total decisions. The confidence intervals for the value of Beta for the predictor variable are reasonably tight for both of the dependent variables, but the confidence interval for the Beta values for the constant, crossed zero when the regression analysis was run for full duty decisions suggesting instability of this model. The number of cases falling outside of the expected ±2 standard deviations was 5.2% for full duty decisions and 4.5% for total decisions, which was around the expectation of 5% but the number falling outside of ±2.5 was again slightly higher than expected at 2.4% for full duty decisions and 2.1% for total decisions. There were eight outliers highlighted as a result of regression with this variable. The histograms and normality plots showed normal distribution of residuals and the plot of standardized residuals against standardized predicted values showed random distribution suggesting that the assumptions of regression had been satisfied.

It is no surprise that the poverty variable appeared to be a very good indicator for predicting homelessness levels. The research documenting low income as a precursor to homelessness is extensive (e.g. Anderson, Kemp and Quilgars, 1993; Mojtabai, 2005; O'Callaghan et al, 1996) and the idea of poverty and social exclusion being linked is not a new one (Marx and Engels. 1950; Barry, 2002; Townsend, 1979; Burchardt et al, 2002).

5.3.4 Regression using two of the remaining independent variables

It was not possible to find a robust model using all of the remaining variables and simple regression produced a number of possible useful models. Consequently, regression using two of the independent variables was explored using variables that were not unreasonably correlated with each other, in order to see if the simple regression models could be significantly improved upon. There was multicollinearity between logrelationship1 and the variables for under 18 conceptions (logsexage3) and limiting long term illness (logpoorhealth1), so regression was run for full duty decisions for logrelationship1 and logethnicity2 and logpoverty3. Although both of these regressions did improve the model, the addition of these extra variables to the model was minimal, with the addition of each one only explaining less than an additional 1% of the variance in the outcome variable. There was also multicollinearity between logsexage3 and the variables logpoverty3 and logpoorhealth1 so regression was run for full duty decisions with logsexage3 and logethnicity2. Again, whilst inclusion of the additional variable did improve the model, the amount of variance in the outcome variable explained by the model was increased by less than 2%. Regression was also run for full duty decisions with independent variables logpoorhealth1 (limiting long term illness) and logpoverty3 (Income based JSA claimants) and logethnicity2 (mixed race). The inclusion of each of these variables did improve on the model using the poorhealth variable alone but the inclusion of the poverty variable only accounted for an additional 2% of the variance in the outcome variable and the inclusion of the ethnicity variable, mixed race, explained a further 4½% of the variance in the outcome variable. Whilst the inclusion of the ethnicity variable did appear to be beneficial, the total variance in the outcome variable explained by the revised model, including the variables for poor health and ethnicity, was still less than the variance in the outcome variable explained by the simple regression models, just using either the variable for relationship breakdown, under 18 conceptions or social disadvantage factor scores.

5.3.5 Regression using three of the remaining independent variables

Regression using three of the independent variables was also explored using variables that were not unreasonably correlated with each other, in order to see if the simple regression models could be significantly improved upon. There were only two possible combinations using three variables that were not unreasonably correlated with each other; the relationship breakdown, poverty and ethnicity variables and then the poor health, poverty and ethnicity variables. The first of these combinations produced an R^2 figure of .776 ($p>0.01$) for full duty decisions and .742 for total decisions. The second combination produced R^2 figures of .742 for full duty decisions and .717 for total decisions. Whilst both of these combinations produced pretty good explanations for the variance in the outcome variables, there was no really significant improvement made on the model produced by the simple regression of variables for relationship breakdown, social disadvantage factor scores or the under 18 conceptions variable.

Due to the multicollinearity issue, there were no four variable combinations for the remaining independent variables that could be used in regression for the two dependent variables. A summary detailing of the amount of variance in the two outcome variables, explained by the individual remaining independent variables and the combinations of those variables that didn't demonstrate multicollinearity with each other, is shown in **Figure 42**.

5.3.6 Summary of multivariate analysis at Local Authority level

Multiple regression using all of the remaining predictor variables and the two possible dependent variables in turn produced unreliable models due to a significant problem with multicollinearity. Although variables were dropped from the analysis in an attempt to reduce multicollinearity to a more manageable level, this did not resolve the issue. Factor analysis was undertaken to try to amalgamate variables and this process resulted in only one factor being extracted. Simple regression using the social disadvantage factor scores produced a reasonable model but after running simple regression on the remaining variables as well, it was discovered that the predictor variable for relationship breakdown produced a marginally better model than the social disadvantage factor scores and the under 18 conceptions variable produced a comparable model. The principle of Ockham's razor, also known as the principle of parsimony, says that in a choice among competing models, other things being equal, the simplest is preferable. (Abraham and Ledolter, 1983). This would suggest that, in the absence of being able to produce a model incorporating all of the remaining predictor variables due to issues of multicollinearity, a basic model using the relationship breakdown variable or the under 18 conceptions variable regressed with full duty decisions would be the most acceptable model for data at local authority level. The evidence from the earlier partial correlation analysis (see above at **5.2.5.1**) indicates that these two variables have a large impact on the other remaining possible predictor variables; highlighting that controlling for the effect of the relationship breakdown variable reduces the share of the variance in the outcome variable explained by the poor health variable from 68% to 1.7% and of the ethnicity variable from 55% to 1.6%. Additionally, the under 18 conceptions variable reduces the share of the variance in the outcome variable explained by the poor health variable from 68% to 2.1% and the share explained by the poverty variable from 67.2% to 4.1%. It will therefore be these powerful variables that are used for further analysis using data at county and PCT level.

5.3.7 Modelling at different levels of the administrative hierarchy

5.3.7.1 County level

The base variable data for the relationship breakdown variable and the under 18 conceptions variable was amalgamated to county level and distribution statistics for these new variables at county level were run to assess whether parametric testing would be possible. The results can be seen at **Figure 43**. The variables failed to demonstrate normal distribution at county level as was the case at local authority level. The descriptive statistics and the histograms showed significant skew and kurtosis for both of the variables and the Kolmogorov-Smirnoff figures confirmed that the data showed significant deviation from normal distribution. These new variables were therefore transformed at county level. As in earlier analysis, scatterplots and correlation statistics were then generated for the outcome variables and the new county level variables and the results can be seen in **Figure 44**. Both of the new variables showed a positive relationship with the dependent variables. The correlation matrix highlighted that there was strong correlation between variables at a significance level of $p<0.01$ (one-tailed) and multicollinearity between the new county level variables.

In order to ascertain whether the county level variables could potentially improve the model, simple regression was run for the two remaining variables at county level; heroin use (logdrugs1) and young people discharged from care (deinst7), with both dependent variables. Regression using the drugs variable produced a reasonably stable model for both dependent variables at county level. The variable for young people discharged from care also produced a reasonable model, albeit less powerful than the drugs variable, however the distribution of the residuals was questionable. Simple regression was then also run for the new county level variables with both dependent variables. Not surprisingly, both variables produced very strong models. A summary of the R^2 values can be seen at **Figure 45**. After running simple regression with each of the four predictor variables at county level, regression was run with combinations of two and then three predictor variables and both dependent variables. Regression using all four predictor variables at county level failed to produce a stable model due to the issue of multicollinearity between the two variables from local authority level. Including the drugs variable and the discharged from care variable together did result in improvement on the results from simple regression at county level but the model was still not as powerful as that achieved with simple regression at local authority level. Additionally, the t-tests associated with the b values were not significant for the discharged from care variable in the regression models at county level and the confidence intervals crossed zero for both the discharged from care variable and the under 18 conceptions variable indicating instability of the new models. The best regression model attained at county level used just the relationship breakdown variable; producing a marginal improvement on the regression model produced at local authority level.

Partial correlation analysis was run to investigate the relationship between the variables at county level further. The table below highlights the percentage share of the variance in the outcome variable without taking into account the effect of the other variables and then in each row, the percentage share of the variance in the outcome variable when the effects of the different county level variables are controlled.

	Logdrugs1	Deinst7	Logsexage3[a]	Logrelationship1[a]
	41.1%	**46.4%**	**65.1%**	**78.9%**
Logdrugs1	-	30.9%	42.5%	50.7%
Deinst7	24.2%	-	38.8%	65.3%
Logsexage3[a]	2.7%	5.7%	-	14%
Logrelationship1[a]	11.5%	0.01%	8.6%	-

Table 5.8 Percentage share of the variance in the outcome variable full duty decisions - County level

As can be seen in the above table, the variance of the outcome variable shared by Deinst7 is reduced to 0.01% when the effects of the relationship breakdown variable are controlled. This result and the effect of the drugs variable when the under 18 conceptions variable is controlled are the only partial correlations which cause serious concern as the other variables still retain a reasonable level of unique variance, albeit significantly reduced, when the effects of the other variables are controlled.

5.3.7.2 PCT level

Again, the data for the two key Local Authority level variables was amalgamated to PCT level and descriptive statistics were run for the new variables. These results can be seen at **Figure 46**. The variables failed to demonstrate normal distribution at PCT level and this was confirmed by the normality plots and the figures for skew, kurtosis and Kolmogorov-Smirnov. The new variables were therefore once again transformed and the new logvariables did demonstrate normal distribution. Scatterplots and correlation statistics were generated for the new variables and the poor health variable and both of the dependent variables at PCT level. The results can be seen at **Figure 47**. The scatterplots indicated a positive linear relationship between the predictor variables and the outcome variables and the correlation matrix indicated significant correlation between all variables with $p<0.01$ (one-tailed). Not surprisingly, multicollinearity was again evident between the under 18 conceptions variable and the relationship breakdown variable but all three predictor variables at PCT level showed strong positive correlation with the dependent variables. Simple regression was therefore run for all these variables. Regression was also run using the poor health variable with each of the other two variables. A summary of the R^2 values can be seen at **Figure 48**. The models produced at PCT level were less powerful and far less stable than at local authority or county level. In simple regression, confidence intervals crossed zero in all of the models except for those using the relationship breakdown variable. When the poor health variable was used with either the under 18 conceptions variable or the relationship breakdown variable in the regression models, the contribution from the poor health variable was only significant at the 0.05 level (one-tailed) and the confidence intervals were again questionable, particularly when regressed with the under 18 conceptions variable. No regression model at PCT level proved to be an improvement on those generated at local authority level.

Partial correlation analysis was then undertaken on the variables to further explore relationships between them. The table below highlights the percentage share of the variance in the outcome variable without taking into account the effect of the other variables. Then in each subsequent row, the percentage share of the variance in the outcome variable when the effects of the different PCT level variables are controlled.

	Logrelationship1[b]	Logsexage3[b]	Logpoorhealth3
	67%	**65.9%**	**42.5%**
Logrelationship1[b]	-	9.4%	4%
Logsexage3[b]	12.6%	-	3.8%
Logpoorhealth3	45%	43.2%	-

Table 5.9 Percentage share of the variance in the outcome variable full duty decisions[b] – PCT level

Again the partial correlation figures indicate a substantial overlap of share of the variance in the outcome variable between the poor health variable and the relationship breakdown variable and between the poor health variable and the under 18 conceptions variable; with the poor health variable's share of the variance on the outcome variable being reduced to just 4% unique variance when the effects of the relationship breakdown variable are controlled and to 3.8% when the effects of the under 18 conceptions variable are controlled. This confirms that running a regression model to include the additional poor health variable is unlikely to add significant value to the model.

5.3.8 Multilevel modelling

Multilevel modelling considers relationships across the different levels of investigation. Whilst such analysis might have seemed appropriate to consider the relationships between variables across the different levels of administrative hierarchy (local authority, county and PCT levels) this was not in fact the case. Administration in a local authority area is often regarded as being two tiered with county administration perceived to be an over-arching authority, (e.g. the geographical area covered by Exeter City Council forms part of the geographical area covered by Devon County Council). However, the units of analysis used in this research are not hierarchical. They do not belong as a subset to the different levels of administrative authority. The different authorities are simply responsible for managing different aspects of society. It was not therefore possible or appropriate to undertake multilevel modelling as part of this research.

5.4 Summary of analysis at different administrative levels

Despite analysis of variables at county level and PCT level, any models explored failed to offer an improvement on the models produced from data at the local authority level. Whilst there were predictor variables at county and PCT level that showed positive correlation with the outcome variables they did not appear to materially contribute to a regression model for predicting the number of decisions made on homeless applications. In fact, inclusion of these variables in the regression analysis actually seemed to reduce the predictive ability of the model in some cases. In the absence of other indicators being available at the county and PCT level, it seems reasonable to conclude that a regression model based only on data at local authority level is the most acceptable and practical way forward.

5.5 Residual analysis

The best fit model was that using the independent variable for relationship breakdown regressed on full duty decisions. Closely, followed by the models produced by independent variables social disadvantage factor scores and under 18 conceptions. All three of these independent variables also explained at least 71% of the variance in total decisions. It was therefore decided to take a closer look at the residuals for all of these models to determine which, if any, would be appropriate for further investigation.

5.5.1.1.1 Analysis of residuals for regression using social disadvantage factor scores and both dependent variables

As stated above (at **5.3.3.1**), the histogram, the QQ plot and the scatter diagram showed that the standardised residuals demonstrated normal distribution for both dependent variables. The figures for Cook's distance also looked very encouraging with a maximum figure of .113 for full duty decisions and .105 for total decisions. This was supported by the figures for Mahalanobis distance (Barnett and Lewis, 1978) which had maximum figures of less than 15 for both dependent variables. With the large sample size and only one predictor variable, this is not a cause for concern (Barnett & Lewis, 1978). The figures for Cook's and Mahalanobis' distances suggested that no single case was having an undue influence on the model. However, the distribution statistics for the residuals were a little more concerning. In particular, the minimum values for the standardised residuals were -5.181 for full duty decisions and -4.841 for total decisions. Both of these figures were well outside expected parameters and therefore unlikely to happen by chance. This would normally shed doubt on the reliability of a model however these extreme figures did relate to the same outlying cases and are discussed further below.

5.5.2 Residuals for logrelationship1 with both dependent variables

Again, as stated above (at **5.3.3.5**), the histogram, the QQ plot and the scatter diagram showed that the standardised residuals demonstrated normal distribution for both dependent variables. Once again the figures for Cook's distance looked very encouraging with a maximum figure of .099 for full duty decisions and .100 for total decisions. Whilst the Cook's distance figures were again supported by the figures for Mahalanobis' distance, the maximum value for this predictor variable was much higher than that demonstrated by social disadvantage factor scores. The maximum figure of just over 39 for both dependent variables did however still fall within acceptable parameters given the sample size (Barnett & Lewis, 1978) and it was therefore safe to conclude that no one case was having a particularly strong influence on the model. In terms of the distribution, more than the expected number of cases fell outside the parameters of 2.58 standard deviations, particularly with total decisions. These were generally the same cases that presented as outliers in the regression using social disadvantage factor scores, but the standardised residual figures tended to be less extreme with the regression for this independent variable. These outliers are discussed further below at 5.6.

5.5.3 Residuals for logsexage3 with both dependent variables

Again, the normal distribution of the standardised residuals as shown in the histogram, QQ plot and scatterplots generated and discussed above at **5.3.3.3** suggested that the residual assumptions for a good regression model had been met. The figures for Cook's and Mahalanobis' distances showed no cause for concern for either dependent variable which again suggested that there were no individual cases that had undue influence on the models. Again, the reliability of the models was generally supported by the distribution statistics for the residuals which showed that 98.23% of cases fell with 2.58 standard deviations for regression on full duty decisions and 98.96% for regression on total decisions. The minimum and maximum standardised residual values for regression on full duty decisions were however less than those for regression on total decisions. Given the fact that the confidence intervals for the constant in the regression model crossed zero for the model using total decisions, albeit at very small margins, the model for full duty decisions appeared to be a more robust and reliable model than that produced with the same independent variable and total decisions.

5.6 Outliers for the models

A number of cases repeatedly presented as outliers in each of the models. Specifically, there were four cases that appeared as outliers in regression for all of the remaining models: Rutland, Alnwick, Windsor and Maidenhead and Fylde. Aylesbury Vale appeared as an outlier in regressions for four of the remaining variables. Runnymede, West Lancashire, Sefton, South Bucks and Westminster appeared as outliers in regressions for three of the remaining models and Barrow in Furness, Hertsmere and North Warwickshire appeared as outliers in regressions for two of the remaining models. A summary of these cases and their characteristics is listed below over page. As can be seen by the information contained in the table and the location of the outlying cases as shown on the map below, there is no obvious pattern which explains all of the outliers. However, the majority of the outlying cases do appear to be predominantly rural in nature and there does seem to be clustering around the North West of the Country and the greenbelt area to the west of London. The remaining outliers could be seen to be in relatively isolated areas of the country. Apart from the obvious exceptions of Westminster and Sefton, the population densities of the majority of the outlying Councils are relatively low. Given the sample size, the number of outlying cases and the extent to which they deviate from the expected values are within acceptable limits. Exclusion of the outliers to improve the models was considered but according to Stevens (1992) if a significant outlier has a Cook's distance of less than 1 there is no real need to remove the case as it does not have a large effect on the regression analysis. All of the outliers did demonstrate Cook's distances of less than 1 and were therefore not excluded from the regression analysis.

Council (position on map below)	Size in hectares	Population	Council Type	Population Density	Significant features
Rutland (6)	38157	34563	Unitary	0.91	Rural
Fylde (4)	16553	73217	Borough	4.42	North west – rural
Alnwick (1)	107951	307190	District	0.29	One of the most rural & sparsely populated districts, remote
Windsor & Maidenhead (11)	19652	133626	Unitary	6.80	Rural, 83% greenbelt, 4800 acres of crown land, 1000acres National Trust. Royal links
Aylesbury Vale (8)	90275	165748	District	1.84	Rural
Runnymede (13)	7804	78033	Borough	10.00	Affluent, high housing cost
West Lancashire (3)	34679	108378	District	3.13	Rural, north west.
Sefton (5)	15314	282958	Met Borough	18.48	Mixed, coast, rural, industrial. North west
South Bucks (9)	14128	61945	District	4.38	Rural
Westminster (12)	2148	181286	ILB	84.40	Urban, commercial
Barrow in Furness (2)	7796	71980	Borough	9.23	Remote, south tip of Cumbria, surrounded by beauty
Hertsmere (10)	10116	94450	Borough	9.34	
North Warwickshire (7)	28427	61860	Borough	2.18	Mainly rural with over half within greenbelt

Table 5.10 Characteristics of outlying cases

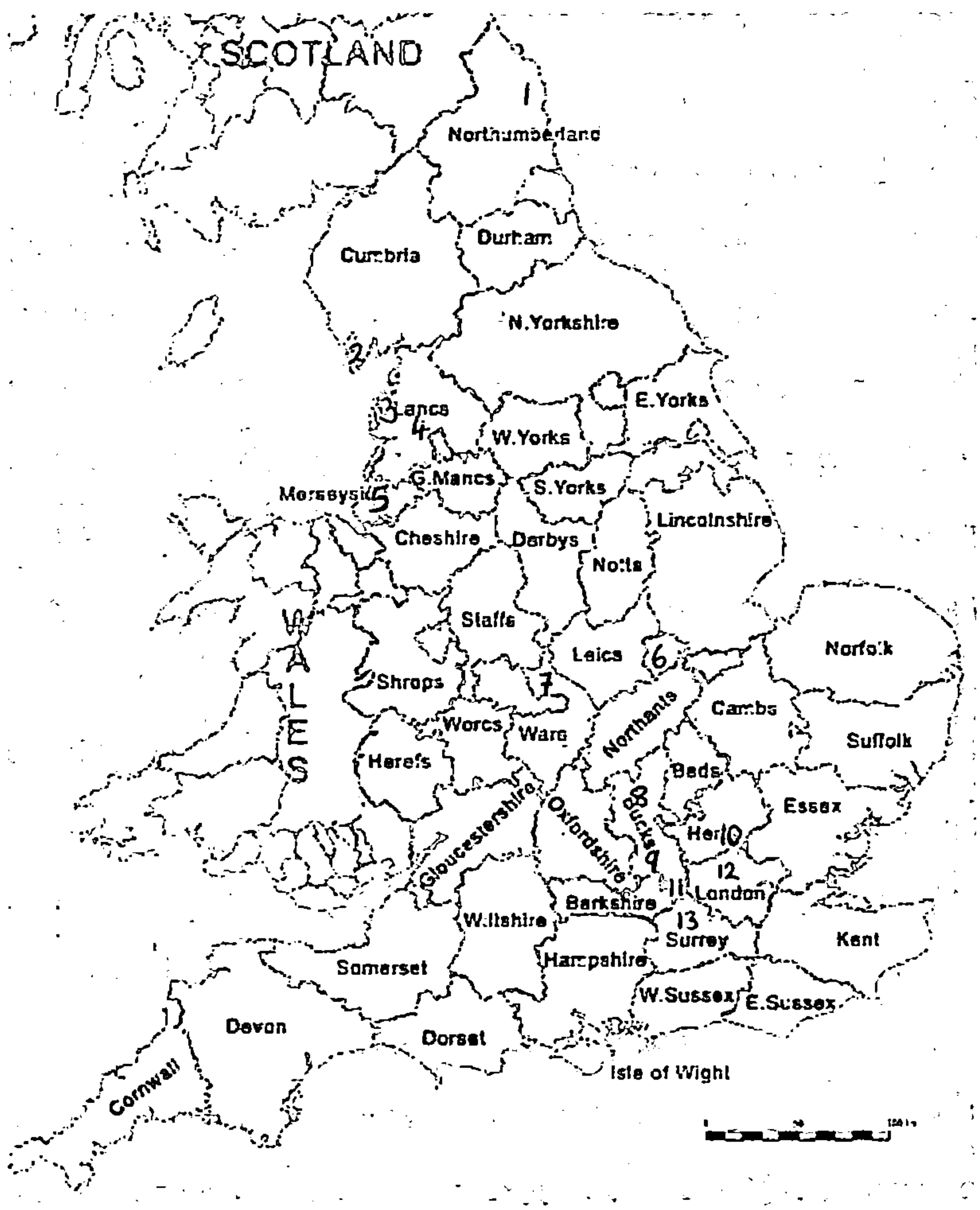


Illustration 1: Map showing location of outlying councils

5.7 Conclusions

All of the possible predictor and outcome variables identified were analysed to see if it were possible to construct a model to predict levels of homelessness. Univariate analysis was carried out to explore the data and assess whether parametric testing would be possible. This led to the transformation of all of the dependent variables and a large majority of the independent variables. Once univariate analysis and transformation had clarified what tests could be utilised, bivariate analysis was carried out for all the possible predictor variables against all the possible outcome variables to see where relationships existed and the strength of those relationships. Multivariate analysis was then undertaken to try to determine the extent of predictability of the independent variables. Regression was the main method used in the multivariate analysis and analysis showed a significant problem with multicollinearity amongst the variables. Factor analysis was used to try to resolve this problem but only one factor was extracted and the social disadvantage factor scores failed to produce a better model that simple regression techniques on individual predictor variables. Looking at the other available predictor variables at different levels (county and PCT) involved amalgamating data for variables at local authority level so that they could be compared alongside those at county and PCT level. Although this reduced the sample size, comparison via partial correlation analysis revealed that little additional unique variance could be attributed to the variables for county and PCT level and that a model using only local authority level data was the most appropriate way forward. It was therefore decided to test all of the possible simple regression models generated using local authority level data above, in order to determine the most appropriate, powerful and stable models for use by local authorities. The results of this testing can be seen in the next chapter.

Chapter 6: Testing and evaluation of the potential models

6.0 Introduction

This chapter tests the models produced in chapter five, by looking at how they fit for different council types and two random samples of 50% of all cases. The previous chapter highlighted that each of the remaining five variables at local authority level appeared to produce strong models for predicting levels of homeless decisions within a local authority area. These variables were sexage3, relationship1, ethnicity2, poorhealth1 and poverty3. The strength of these simple regression models was not markedly improved by including any of the three other remaining variables from the different administrative levels (county and PCT) in the models. In addition to the single variable models, a model based on the 'social disadvantage' factor score also appeared to be very strong (calculated as detailed in the previous chapter **5.3.2** and shown in Appendix 4). The social disadvantage factor was extracted from the five remaining variables at local authority level. This chapter therefore tests all 6 simple regression models for both dependent variables (full duty decisions and total decisions) in turn, using random samples as well as using the much smaller subsets of different council type. For each of the individual predictor variables there is firstly, a general discussion about the reliability of the model based on that predictor. This is followed by two summary tables for each of the predictor variables, highlighting key aspects of the regression models using each of the dependent variables. The results of the numerous regression models run on the different council types are then looked at in detail. The chapter then includes a critical analysis of the models, highlighting that using any one of several independent variables produces similar results and there is a discussion as to whether this is a good or bad thing. The chapter highlights the limitations of the models and the lack of useable statistics in highly relevant areas such as relationship breakdown and deinstitutionalisation and discusses whether, if better statistics existed in an appropriate format in these areas, the model could be substantially improved. It discusses the 'usability' of such a model with regard to availability of relevant statistics, skill base of decision makers within Local Authorities as well as whether such a method would be supported by Central Government. The regression models that proved to be valid and strong throughout the testing are detailed in the final chapter.

6.1 Testing the different models

Regression analysis was carried out on two separate random samples, using each predictor variable against both of the outcome variables. Each of the key predictor variables at local authority level appeared to produce acceptable levels of statistical fit for predicting levels of homelessness decisions. It was therefore considered necessary to test the models for all of these variables. Further testing was then carried out based on council type (see **3.3** earlier); running regression analysis based on this grouping for the full sample and for both of the random samples. Although outliers in the full sample and the two random samples did not exert excessive influence on the overall models, when the samples were split into council types, regression did highlight a small number of cases within some of the groups that exerted excessive influential on the regression model for that group (where the figures for Cook's distances were greater than 1). Where this occurred the regression analysis was run again excluding those cases to see if such action had a significant affect on the models. All of the results were checked for consistency and reliability.

Summary tables of some of the key aspects of the regression analyses undertaken for each of the predictor variables against both total decisions and full duty decisions are included in the body of this chapter.

The results for the general regression analysis run on the main sample and the two random samples were generally consistent for each of the predictor variables across all three samples, with the percentage of the variance in the outcome variable explained by the predictor variable varying by a maximum of 4%. Generally speaking, the same outliers were identified in the random samples as were identified in the full sample and Cook's distances indicated that no individual cases had an undue influence on the models. Confidence intervals for the beta values were generally good and the residual plots indicated normal distribution and homoscedasticity in all cases. These findings suggested that the various models were, on the face of things, relatively stable although each individual model is looked at in more detail below.

When the samples were split into council type there were some marked differences in how much of the variation in the outcome variable was explained by the various models. The results showed significant deviations for some council types from the figures for the samples as a whole. Almost every model produced significant regression coefficients, with $p<.001$ in all cases unless otherwise stated. The only models that proved not to be significant at all related to the grouping of Inner London Borough Councils, one instance within the group of Outer London Borough Councils and one instance for the group of Metropolitan Borough Councils. This was probably due to the small sample sizes involved in these particular models. As a basic guide, between 10 and 15 cases are recommended for each predictor variable in the regression equation (see Field, 2005 and **4.2.12.1**. earlier). The Inner London Borough group had a maximum of 8 cases in the group and therefore fell short of the recommended sample size. The size of the group for City Councils in each of the samples was also a concern, verging on unacceptable levels for the random samples. As a result of these findings, the London Borough Councils were regrouped together to form a larger sample on which to base further analysis and the regressions were run again on the new group. Whilst this step improved the sample size for the full sample, the two random samples for this council group were still very small. London Borough Councils were therefore regrouped once again with Metropolitan Borough Councils on the basis that both council types represented urban, densely populated areas. Additionally, after running the initial analysis, the groups for Unitary Councils and City Councils were also regrouped together to improve the sample size for regression purposes. This was considered reasonable given that both council types generally included at least one main urban centre providing all key services to the locality. Green's rule of thumb for appropriate sample sizes (Green, 1991) suggests that a sample of 58 would be the preferred size for regression with just one predictor variable (see earlier at **4.2.12.1**). Amalgamating the councils into larger groups went some way to satisfying this requirement. Regression was rerun with these revised groups and generally provided more acceptable, reliable models. The results for the models for each one of the predictor variables are discussed in more detail below and summarised in the tables within each subsection. Acceptable group sizes are highlighted in black print and the smaller groups in grey print. The tables detail the sample size used for each model produced, the value of R^2, which shows the overall goodness of fit, the Durbin-Watson statistic which tests for serial correlations between errors in each model and should be close to 2 if the assumption of independent errors is to be satisfied, the confidence intervals, the residuals and the outlying cases. The column headed 'confidence intervals' contains a '√' ,a 'x' or 'constant?'. A 'x' indicates that the confidence intervals for the beta value were either very large or crossed zero. As the sign (positive or negative) of the beta value describes the direction of the relationship between the predictor and the outcome, confidence intervals that crossed zero generally indicated a very unreliable model. A '√' indicates that the intervals were small and did not cross zero. A 'constant?' indicates that whilst the intervals for the beta coefficient were acceptable, the confidence intervals for the value of the constant were questionable, either because they crossed zero or because they were particularly large. The column headed 'residuals' contains either a '√' ,a 'x' or a '?'. A '√' indicates that, after considering the histogram and normal probability plot of the residuals, the model residuals were considered to be normally distributed and homoscedastic. A 'x' indicates that the residuals of the model did not satisfy these requirements and a '?' indicates that the requirements might not have been satisfied and additional investigation would have been required if that particular model were to have been considered further.

6.1.1.0 Overview of the regression models using the 'social disadvantage' factor and homeless decisions for 2003 for the full sample and two random samples.

When regression was run for the model using social disadvantage factor scores on the two separate random samples the results were consistent with the full sample results (detailed in the previous chapter at **5.3.3.1**). Despite the sample sizes being approximately half that of the full sample, results showed that the predictor variable 'Social disadvantage factor scores' still explained between 71% and 73% of the amount of variance in total decisions and between 73% and 79% for full duty decisions. The confidence intervals for the beta values were good and the Durbin-Watson figures stayed close to 2 in both random samples, for both outcome variables, suggesting the assumption of independence of errors had been satisfied in all three of the samples considered. This suggestion was further supported by the residual charts which confirmed homoscedasticity in all three samples for both outcome variables. The random samples identified outlying cases already identified in the full sample and the number of outlying cases fell within expected and acceptable limits. The figures for Cook's distances indicated no individual cases as having an undue influence on the models. The regression analysis run for the different types of Council in each of the three samples showed wide differences in the amount of variance in the outcome variable explained by this predictor. These results are detailed in the following tables over page:

Key aspects of the regression model for the social disadvantage factor scores regressed with total decisions	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	289	0.73	1.723	√	√	Westminster[1], Alnwick[123], South Bucks[12], Rutland[123], Windsor & Maidenhead[1], Sefton[123], Barrow in Furness[123], Runnymede[1], Fylde[12], Mansfield[12], West Somerset[123], Aylesbury Vale[1], Gedling[3]
Random sample A ([2])	149	0.713	2.023	√	√	
Random sample B ([3])	134	0.725	2.084	√	√	
Borough Councils[1]	86	0.513	1.71	√	√	Barrow in Furness[123], Fylde[12], Castle Morpeth[3], Gedling[123], Runnymede[12]
Borough Councils[2]	56	0.53	2.223	√	√	
Borough Councils[3]	50	0.484	1.284	√	√	
District Councils[1]	103	0.401	1.82	√	√	Mansfield[12], South Bucks[12], Aylesbury Vale[123], Alnwick[123]
District Councils[2]	84	0.408	2.139	√	√	
District Councils[3]	82	0.412	2.17	√	√	
Unitary Councils[1]	37	0.719	2.031	√	√	Windsor and Maidenhead[123], Kingston upon Hull[1]
Unitary Councils[2]	24	0.805	2.04	√	√	
Unitary Councils[3]	29	0.785	2.313	√	√	
City Councils[1]	16	0.887	2.363	√	√	
City Councils[2]	8	0.908	2.491	√	?	
City Councils[3]	10	0.805	2.357	√	?	Worcester[13]
Inner London Borough Councils[1]	8	NS	1.806	X	?	
Inner London Borough Councils (influential cases removed)[18]	7	NS	1.653	X	?	none
Outer London Borough Councils[1]	14	0.687	1.144	√	√	Harrow[1]
London Borough Councils[1]	22	0.614	1.552	√	√	
London Borough Councils[2]	13	0.497	1.76	√	√	
London Borough Council[3]	13	0.719	1.439	√	√	Westminster[1], Harrow[13]
Metropolitan Borough Councils[1]	25	0.476	1.734	√	√	
Metropolitan Borough Councils[2]	16	0.476	1.955	√	?	
Metropolitan Borough Councils[3]	12	0.647	2.047	√	?	Sefton[123]
Unitary & City Councils[1]	53	0.745	1.983	√	√	Rutland[1], Windsor & Maidenhead[123], Worcester[13], Liverpool[2]
Unitary & City Councils[2]	32	0.762	1.95	√	√	
Unitary & City Councils[3]	39	0.755	2.156	√	√	
London & Metropolitan Borough Council[1]	47	0.484	1.498	√	√	
London & Metropolitan Borough Council[2]	29	0.45	1.786	√	√	
London & Metropolitan Borough Council[3]	25	0.646	1.975	√	√	Westminster[1], Sefton[123], Walsall[12], Wirral[13]

Table 6.1 – Key aspects of the results of regression model testing – predictor variable social disadvantage factor scores with total decisions 2003

Key aspects of the regression model for the social disadvantage factor scores regressed with full duty decisions	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	288	0.763	1.886	√	√	
Random sample A ([2])	148	0.728	1.982	√	√	
Random sample B ([3])	135	0.79	2.245	√	√	Fylde[12], North Warwickshire[123],Alnwick[123], Rutland[123], Windsor and Maidenhead[1], Merton[1], Sefton[123], Hertsmere[12], West Lancashire[2]
Borough Councils[1]	87	0.532	2.175	√	√	
Borough Councils[2]	57	0.492	2.187	√	√	
Borough Councils[3]	51	0.56	1.859	√	√	Fylde[12], North Warwickshire[123], Hertsmere[2], Castle Morpeth[3]
District Councils[1]	102	0.456	2.269	√	√	
District Councils[2]	83	0.429	2.338	√	√	
District Councils[3]	81	0.439	2.298	√	√	West Lancashire[123], Alnwick[123]
Unitary Councils[1]	37	0.799	1.737	√	√	
Unitary Councils (influential cases removed)[1a]	36	0.652	1.703	√	√	
Unitary Councils[2]	24	0.83	1.724	√	√	
Unitary Councils[3]	29	0.84	1.875	√	√	Windsor and Maidenhead[11a23], Poole[1a]
City Councils[1]	16	0.851	2.279	√	√	
City Councils[2]	8	0.805	1.69	√	?	
City Councils[3]	10	0.805	3.028	√	x	None
Inner London Borough Councils[1]	8	0.619	1.417	√	?	
Inner London Borough Councils (influential cases removed)[1a]	7	NS	1.406	√	√	None
Outer London Borough Councils[1]	14	0.659	1.587	√	?	Merton[12]
London Borough Councils[1]	22	0.667	1.594	√	?	
London Borough Councils[2]	13	0.622	2.141	√	√	
London Borough Council[3]	13	0.772	1.446	√	√	Merton[11a2]
Metropolitan Borough Councils[1]	24	0.539	1.401	√	√	
Metropolitan Borough Councils (influential cases removed)[1a]	22	0.441	1.937	√	√	
Metropolitan Borough Councils[2]	15	0.528	1.576	√	√	
Metropolitan Borough Councils[3]	12	0.689	2.152	√	?	Sefton[13]
Unitary & City Councils[1]	53	0.794	1.632	√	√	
Unitary & City Councils[2]	32	0.771	1.599	√	√	
Unitary & City Councils[3]	39	0.8	1.934	√	√	Rutland[1], Windsor & Maidenhead[123], Liverpool[12]
London & Metropolitan Borough Council[1]	46	0.558	1.335	√	√	
London & Metropolitan Borough Council[2]	28	0.536	1.632	√	√	
London & Metropolitan Borough Council[3]	25	0.701	1.75	√	√	Merton[1], Sefton[123]

Table 6.2 – Key aspects of the results of regression model testing – predictor variable social disadvantage factor scores with full duty decisions 2003

6.1.1.1 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for borough councils

The model explained between 48% and 53% of the variance in total decisions and between 49% and 56% for full duty decisions. The confidence intervals were good for all samples and both dependent variables and the residuals demonstrated independence, normal distribution and homoscedasticity. No cases exerted undue influence on the models and the number of outliers was within expected parameters.

6.1.1.2 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for district councils

The model explained between 40% and 41% of the variance in total decisions and between 43% and 46% for full duty decisions. The confidence intervals were good for all samples and both dependent variables and the residuals demonstrated independence, normal distribution and homoscedasticity. No cases exerted undue influence on the models and the number of outliers was within expected parameters. When influential cases were removed, the amount of variance explained by the regression model rose to 45% for total decisions and to 51% for full duty decisions.

6.1.1.3 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for unitary councils

The model explained between 72% and 80% of the variance in total decisions and between 80% and 84% for full duty decisions. Again, the confidence intervals were good for all samples and both dependent variables and the residuals demonstrated independence, normal distribution and homoscedasticity. The outlying cases were within expected parameters. There was one case exerting undue influence on the models for this group for full duty decisions and when this case was removed from the full sample and the regression run again, the amount of variance explained by the regression model dropped significantly to 65%.

6.1.1.4 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for city councils

The model explained between 81% and 91% of the variance in total decisions and between 81% and 85% for full duty decisions. The confidence intervals were good for all samples and both dependent variables. However, in the random samples the residuals did not clearly demonstrate normal distribution and homoscedasticity. This is possibly due to the size of the samples. There were only eight cases in this group for random sample A and only ten for random sample B. There were no cases exerting undue influence on the models and there was only one outlying case.

6.1.1.5 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for unitary & city councils combined

The models produced for all three samples were very similar to each other, explaining between 75% and 76% for total decisions and between 77% and 80% for full duty decisions. The confidence intervals and residual distribution were good for all models for each of the dependent variables. The R^2 values were not surprisingly between those of the unitary and city council models and appeared to be more robust than those for the individual council group types.

6.1.1.6 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for inner London borough councils

It was not possible to run a regression for this group in the random samples as the group sizes were too small to produce meaningful results. Regression was run for the full sample grouping but failed to produce a significant model for total decisions. Although a significant regression coefficient was produced using full duty decisions, when the influential case was removed, the revised model was not significant. Again, this was probably due to the unacceptably small sample size. There were no outlying cases highlighted.

6.1.1.7 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for outer London borough councils

The model explained 69% of the variance in total decisions and 66% for full duty decisions. The confidence intervals were good for both dependent variables. However, it was difficult to determine whether the residuals satisfied the requirements of homoscedasticity and normal distribution as the sample size was only just acceptable. There were no cases exerting undue influence on the models and there was only one outlier. Harrow was the outlying case for regression on total decisions. This may be explained by the fact that Harrow has adopted a particularly strong prevention stance on homelessness and is being heralded as an example of good practice by Central Government. An alternative view of this approach is that Harrow Council tends to be particularly reluctant to accept homeless applications, instead assertively promoting other options such as mediation and rehousing in the private rented sector. Harrow is arguably not therefore representative.

6.1.1.8 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for all London borough councils

Although significant models were produced for this group in all three of the samples, the models were not consistent across the samples. There was wide variation in the amount of variance in the outcome variable explained by the predictor variable; ranging from 50% to 72% for total decisions and from 62% to 77% for full duty decisions. The confidence intervals for all samples were good and the residuals appeared to satisfy the assumptions for a reliable model. The wide variation across the samples does however raise questions about how reliable social disadvantage factor scores are for predicting homeless decisions for the London Boroughs.

6.1.1.9 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for metropolitan borough councils

The full sample and random sample A both produced models that explained the same proportion of the variance in the outcome variables (48% for total decisions and 53-54% for full duty decisions). However the proportions of variance in the outcome variables explained by the models for random sample B were much higher at 65% for total decisions and 69% for full duty decisions. Again, the confidence intervals were good for all samples and both dependent variables but it was difficult to determine whether or not the residuals demonstrated independence, normal distribution and homoscedasticity as the sample sizes were verging on the unacceptable level at 16 and 12 for random samples A and B respectively. This issue was further explored by excluding the two influential cases highlighted in regression for full duty decisions from the main sample and re-running the regression. The revised model reduced the amount of variance explained by the predictor variable by 10% for this dependent variable, thereby further increasing the range of percentage of variance across the samples. The wide variation in these figures suggests that social disadvantage factor scores are not reliable for predicting homeless decisions for Metropolitan Borough Councils.

6.1.1.10 Assessment of how effectively the models using the social disadvantage factor scores predict levels of homelessness decisions for London and metropolitan borough councils

The models produced for two out of the three samples were very similar to each other, explaining between 45% and 48% for total decisions and between 54% and 56% for full duty decisions. The results for random sample B were higher at 65% for total decisions and 70% for full duty decisions. The confidence intervals and residual distribution were good for all models for each of the dependent variables which was an improvement on the results from the individual council groups. The large variance that still existed between the samples did not indicate a stable model for predicting homeless decisions for this council grouping.

6.1.2. Overview of the regression models using the 'separated' variable (logrelationship1) and homeless decisions for 2003 for the full sample and two random samples.

Regression on the random samples for this relationship breakdown variable produced results that were consistent with the full sample results (detailed at **5.3.3.5**). The variable explained between 68% and 71% of the amount of variance in total decisions and between 72% and 77% for full duty decisions. The confidence intervals for the beta values were good and the Durbin-Watson figures stayed close to 2 in both random samples, for both outcome variables, suggesting the assumption of independence of errors had been satisfied in all three of the samples. This was further supported by the residual charts which confirmed normal distribution of residuals and homoscedasticity in all three samples for both outcome variables. The random samples identified outlying cases already identified in the full sample and the number of cases fell just outside the expected limits. The figures for Cook's distances indicated no individual cases as having an undue influence on the models. Again, there were marked differences in strength and reliability of the model across different council types and these results are detailed below.

Key aspects of the regression model for the 'separated' variable regressed with total decisions.	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	290	0.714	1.699	√	√	Aylesbury Vale[1], Alnwick[123], Mole Valley[13], Rutland[123], Mansfield[12], Fylde[12], Runnymede[12], Windsor & Maidenhead[1], Ellesmere Port[1], Barrow in Furness[123], South Bucks[12], Basingstoke & Deane[1], West Somerset[123], East Lindsey[13].
Random sample A ([2])	149	0.691	1.984	√	√	
Random sample B ([3])	134	0.68	2.026	√	√	
Borough Councils[1]	86	0.392	1.745	√	√	Barrow in Furness[123], Fylde[12], Runnymede[12]
Borough Councils[2]	56	0.396	2.319	√	√	
Borough Councils[3]	50	0.346	1.517	constant?	√	
District Councils[1]	104	0.543	1.731	√	√	Mansfield[12], South Bucks[12], Aylesbury Vale[123], Alnwick[123], Mole Valley[13], West Somerset[123], East Lindsey[13]
District Councils[2]	85	0.598	2.02	√	√	
District Councils[3]	84	0.57	1.982	√	√	
Unitary Councils[1]	37	0.634	1.988	√	√	Windsor and Maidenhead[123], Hartlepool[1], Darlington[3]
Unitary Councils (influential cases removed)[1a]	36	0.448	1.917	√	√	
Unitary Councils[2]	24	0.783	2.276	√	√	
Unitary Councils[3]	29	0.76	2.165	√	√	
City Councils[1]	16	0.858	2.25	√	√	Winchester[1], Worcester[3]
City Councils[2]	8	0.772	1.823	constant?	√	
City Councils[3]	10	0.831	1.99	√	?	
Inner London Borough Councils[1]	8	NS	1.593	x	X	None
Inner London Borough Councils (influential cases removed)[1a]	7	NS		x	X	
Outer London Borough Councils[1]	14	0.727	1.367	√	√	Kingston upon Thames[1], Waltham Forest[1a]
Outer London Borough Councils (influential cases removed)[1a]	13	0.873	1.207	√	√	
London Borough Councils[1]	22	0.631	1.576	√	√	Westminster[1]
London Borough Councils[2]	13	0.539	1.861	x	?	
London Borough Council[3]	13	0.736	1.253	√	√	
Metropolitan Borough Councils[1]	25	0.531	1.976	constant?	√	Sefton[13]
Metropolitan Borough Councils[2]	16	0.554	2.187	constant?	?	
Metropolitan Borough Councils[3]	12	0.615	2.417	constant?	?	
Unitary & City Councils[1]	53	0.671	1.918	√	√	Rutland[1], Windsor & Maidenhead[123], Worcester[3]
Unitary & City Councils[2]	32	0.684	2.019	√	√	
Unitary & City Councils[3]	39	0.699	1.873	√	√	
London & Metropolitan Borough Council[1]	47	0.562	1.802	√	√	Westminster[1], Sefton[123], Wirral[13]
London & Metropolitan Borough Council[2]	29	0.539	2.062	x	√	
London & Metropolitan Borough Council[3]	25	0.656	2.358	?	√	

Table 6.3 – Key aspects of the results of regression model testing – predictor variable logrelationship1 with total decisions 2003

Key aspects of the regression model for the 'separated' variable regressed with full duty decisions	sample size	Value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	289	0.769	2.031	√	√	
Random sample A ([2])	148	0.724	2.017	√	√	
Random sample B ([3])	135	0.773	2.197	√	√	Fylde[12], West Lancashire[12], Poole[1], Winchester[12], Aylesbury Vale[1], Alnwick[123], Rutland[123], Windsor and Maidenhead[1], Sefton[1], South Shropshire[13], Hertsmere[1], Harborough[1]
Borough Councils[1]	87	0.494	2.235	√	√	
Borough Councils[2]	57	0.46	2.404	√	√	
Borough Councils[3]	51	0.573	2.126	√	√	North Warwickshire[123], Fylde[12], Hertsmere[12], Castle Morpeth[3]
District Councils[1]	103	0.63	2.269	√	√	
District Councils[2]	84	0.652	2.265	√	√	
District Councils[3]	82	0.64	2.193	√	√	Mansfield[1], South Bucks[1], Aylesbury Vale[1], Alnwick[123], Mole Valley[1], West Somerset[1], East Lindsey[1], West Lancashire[123], Harborough[2]
Unitary Councils[1]	37	0.717	1.819	√	√	
Unitary Councils (infuential cases removed)[1a]	36	0.545	1.765	√	√	
Unitary Councils[2]	24	0.802	2.129	√	√	
Unitary Councils[3]	29	0.805	1.986	√	√	Windsor and Maidenhead[123], Hartlepool[1]
City Councils[1]	16	0.801	2.142	√	√	
City Councils[2]	8	0.63($p<.05$)	1.435	X	?	
City Councils[3]	10	0.81	2.888	√	x	Winchester[1]
Inner London Borough Councils[1]	8	NS	1.472	X	x	
Inner London Borough Councils (influential cases removed)[1a]	7	NS	1.836	X	x	None
Outer London Borough Councils[1]	14	0.693	1.586	√	√	None
London Borough Councils[1]	22	0.667	1.594	√	√	
London Borough Councils[2]	13	0.664	2.526	√	√	
London Borough Council[3]	13	0.776	1.339	√	?	Tower Hamlets[13], Merton[1]
Metropolitan Borough Councils[1]	24	0.575	1.626	√	?	
Metropolitan Borough Councils[2]	15	0.581	1.751	X	√	
Metropolitan Borough Councils[3]	12	0.664	2.459	X	x	Sefton[13], Wirral[1a]
Unitary & City Councils[1]	53	0.711	1.646	√	√	
Unitary & City Councils[2]	32	0.685	1.79	√	√	
Unitary & City Councils[3]	39	0.731	1.767	√	√	Rutland[13], Windsor & Maidenhead[123]
London & Metropolitan Borough Council[1]	46	0.603	1.567	√	√	
London & Metropolitan Borough Council[2]	28	0.601	1.899	√	√	
London & Metropolitan Borough Council[3]	25	0.701	2.107	√	√	Tower Hamlets[1], Merton[1], Sefton[123]

Table 6.4 – Key aspects of the results of regression model testing – predictor variable logrelationship1 with full duty decisions 2003

6.1.2.1 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for borough Councils

The model explained between 35% and 40% of the variance in total decisions and between 46% and 57% for full duty decisions. The confidence intervals were good for all samples and both dependent variables. The residuals were independent, normally distributed and homoscedastic. There were no cases exerting undue influence and the number of outlying cases were few in number and within expected parameters.

6.1.2.2 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for district Councils

The model explained between 54% and 60% of the variance in total decisions and between 63% and 65% for full duty decisions. The confidence intervals were good for all samples and both dependent variables and the residuals demonstrated independence, normal distribution and homoscedasticity. There were no cases exerting undue influence on the models and the number of outlying cases were few in number and within expected parameters. This suggested a robust model for this council grouping and this predictor variable.

6.1.2.3 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for unitary councils

The model explained between 63% and 78% of the variance in total decisions and between 72% and 80% for full duty decisions. Again, the confidence intervals were good for all samples and both dependent variables and the residual demonstrated independence, normal distribution and homoscedasticity. The outlying cases were within expected parameters. Removing the one case exerting undue influence on the models for this group significantly reduced the percentage of variance in the outcome variable explained by the predictor variable; to 45% for total decisions and to 55% for full duty decisions. This substantial drop may be due to the small sample size but without further investigation it is difficult to be conclusive about the reliability of the models for this predictor variable and this council grouping.

6.1.2.4 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for city councils

The model produced from the full sample explained 86% of the variance in total decisions and 80% for full duty decisions. These results were echoed by those produced using random sample B which explained 83% of the variance for total decisions and 81% for full duty decisions. The models produced from random sample A were not so consistent and, for full duty decisions, only produced a regression coefficient significant at $p<0.05$. Further, the confidence intervals for the model produced by this sample crossed zero, suggesting an unreliable result. These unreliable results are likely to be due to the small sample size. The confidence intervals were good for the other samples and both dependent variables. There were no cases exerting undue influence on the models. These results raised concerns over the stability of the models produced using this predictor. Consequently, it was questionable whether this was reliable for predicting homeless decisions for this type of council.

6.1.2.5 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for unitary & city councils

The models produced for all three samples were very similar to each other, explaining between 67% and 70% for total decisions and between 69% and 73% for full duty decisions. The confidence intervals and residual distribution were good for all models for each of the dependent variables. The R^2 values were not surprisingly between those of the unitary and city council models and appeared to be more stable and acceptable than those for the individual council group types. The consistency of the level of variance explained by the predictor variable for this grouping suggests a very strong model for this council grouping.

6.1.2.6 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for inner London borough councils

Again, it was not possible to run a regression for this group in the random samples as the group sizes were too small to produce meaningful results. Regression was run for the full sample grouping but failed to produce a significant model for either total decisions or full duty decisions.

6.1.2.7 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for outer London borough councils

The model explained 73% of the variance in total decisions and 69% for full duty decisions. There was one case exerting excessive influence on the model for regression on total decisions. When the influential case was removed from the sample the percentage of variance in the outcome variable explained by this predictor variable rose to 87%. The confidence intervals were good for both dependent variables as was the distribution of the residuals for the models for this group. The increase in the variance explained by the models as a result of removing the influential case was quite substantial. This sheds doubt on the reliability of using this independent variable to predict homeless decisions for this group. Again, the sample sizes involved for this group are smaller than recommended for producing a robust model. Consequently, removal of one case will inevitably have a larger impact on the model than if the sample size had been more acceptable. This needs to be carefully considered when assessing the reliability of this model.

6.1.2.8 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for all London borough councils

Although significant models were produced for this group in all three of the samples, as with the previous predictor variable, the models were not consistent across the samples. There was wide variation in the amount of variance in the outcome variable explained by this predictor variable; ranging from 54% to 74% for total decisions. The range in the variation was less for full duty decisions, ranging from 66% to 78%. The confidence intervals for the model produced for random sample A and total decisions were not good, crossing zero and displaying large variation. The confidence intervals and the distribution of the residuals were however much more acceptable for the other models for this grouping. The wide variation across the samples does however raise questions about how reliable this predictor variable is for predicting homeless decisions for the London Boroughs.

6.1.2.9 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for metropolitan borough councils

The model explained between 53% and 61% of the variance in total decisions and between 58% and 66% for full duty decisions. Whilst this range was reasonable, the confidence intervals for all models in this grouping were a concern. The intervals were large and crossed zero for most of the models, suggesting a highly unreliable predicting tool for this council grouping.

6.1.2.10 Assessment of how effectively the models using the 'separated' variable predict levels of homelessness decisions for London & metropolitan borough councils

The models for the three samples explained between 54% and 66% for total decisions and between 60% and 70% for full duty decisions. The confidence intervals and residual distribution were good for all models for full duty decisions but the confidence intervals were more questionable for total decisions. Amalgamating the two groups didn't significantly improve the models for these council groups. The large variance that still existed between the samples indicated that the model was unstable for predicting homeless decisions for this council grouping.

6.1.3 Overview of the regression models using the 'under 18 conceptions' variable (logsexage3) and homeless decisions for 2003 for the full sample and two random samples.

Regression analysis on the random samples for this predictor variable produced results that were consistent with the full sample results (detailed at **5.3.3.3**). This predictor variable explained between 71% and 74% of the amount of variance in total decisions and between 71% and 77% for full duty decisions. The confidence intervals for the beta values were good for both dependent variables but better for full duty decisions. Although the confidence intervals for the value of the constant were small with total decisions they did cross zero in all models, albeit by very small margins. This is important to note as the models are based on logarithmic numbers and small changes can therefore have a large impact on the outcome figures when the data is transformed. Nonetheless, the Durbin-Watson figures stayed close to 2 in both random samples, for both outcome variables, suggesting the assumption of independence of errors had been satisfied in all three of the samples. This was supported by the residual plots which confirmed normal distribution and homoscedasticity in all three samples for both outcome variables. The random samples identified outlying cases already identified in the full sample; however the number of outliers was higher than expected which suggests there may be an issue with reliability for this predictor variable. The figures for Cook's distances indicated no individual cases as having an undue influence on the models. The tables below detail how the models compare across the samples:

Key aspects of the regression model for the sexage variable regressed with total decisions.	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	288	0.731	1.827	Constant?	√	Allerdale[1], Alnwick[123], Rutland[123], Runnymede[12], Windsor & Maidenhead[1], Westminster[12], Fylde[12], Gedling[123], South Bucks[1], West Somerset[13], Aylesbury Vale[1], Kingston upon Hull[1], Kingston upon Thames[1], Walsall[12], Castle Morpeth[3]
Random sample A ([2])	149	0.706	1.897	Constant?	√	
Random sample B ([3])	134	0.741	1.826	Constant?	√	
Borough Councils[1]	86	0.501	1.871	Constant?	√	North Warwickshire[2], Castle Morpeth[13], Fylde[12], Runnymede[12], Gedling[123]
Borough Councils[2]	56	0.485	2.089	Constant?	√	
Borough Councils[3]	51	0.502	1.351	Constant?	√	
District Councils[1]	103	0.492	1.961	√	√	Mansfield[12], South Bucks[12], Aylesbury Vale[123], Alnwick[123], Teesdale[1&3], West Oxfordshire[1&3], Mole Valley[1&3], West Somerset[3]
District Councils[2]	84	0.507	2.259	Constant?	√	
District Councils[3]	82	0.519	2.258	Constant?	√	
Unitary Councils[1]	37	0.717	2.067	√	√	Windsor and Maidenhead[11a23], Kingston upon Hull[11a]
Unitary Councils (infuential cases removed)[1a]	36	0.55	2.068	Constant?	√	
Unitary Councils[2]	24	0.803	1.962	√	√	
Unitary Councils[3]	29	0.822	1.88	√	√	
City Councils[1]	16	0.927	1.998	Constant?	?	Worcester[1]
City Councils[2]	8	0.948	2.888	Constant?	?	
City Councils[3]	10	0.855	1.982	Constant?	√	
Inner London Borough Councils[1]	8	NS	1.859	X	?	Westminster[1a], Richmond upon Thames[1a]
Inner London Borough Councils (influential cases removed)[1a]	7	NS	1.891	X	?	
Outer London Borough Councils[1]	14	0.696	1.221	Constant?	?	Merton[1]
London Borough Councils[1]	22	0.536	1.537	√	√	Westminster[12], Harrow[3]
London Borough Councils[2]	13	0.376	1.412	X	√	
London Borough Council[3]	13	0.721	1.418	√	?	
Metropolitan Borough Councils[1]	25	0.457	1.653	Constant?	√	Walsall[12], Leeds[1],
Metropolitan Borough Councils[2]	16	0.444	1.785	Constant?	√	
Metropolitan Borough Councils[3]	12	0.633	1.753	Constant?	√	
Unitary & City Councils[1]	53	0.761	1.97	√	√	Rutland[1], Windsor & Maidenhead[123], Kingston upon Hull[1]
Unitary & City Councils[2]	32	0.773	1.864	√	√	
Unitary & City Councils[3]	39	0.759	2.147	√	√	
London & Metropolitan Borough Council[1]	47	0.309	1.28	√	√	Westminster[12], Sefton[123], Walsall[12]
London & Metropolitan Borough Council[2]	29	0.298	1.395	√	√	
London & Metropolitan Borough Council[3]	25	0.465	1.404	X	√	

Table 6.5 – Key aspects of the results of regression model testing – predictor variable under 18 conceptions with total decisions 2003

Key aspects of the regression model for the sexage variable regressed with full duty decisions	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	288	0.731	1.827	√	√	Fylde[12], North Warwickshire[123], Alnwick[123], Rutland[123], Windsor & Maidenhead[1], Broadland[1], Westminster[12], Tower Hamlets[1], Camden[123], Ashfield[1], Teesdale[1], Nuneaton & Bedworth[3], Sefton[3], West Lancashire[12]
Random sample A ([2])	148	0.711	1.775	√	√	
Random sample B ([3])	135	0.765	1.829	√	√	
Borough Councils[1]	87	0.44	2.101	Constant?	√	North Warwickshire[123], Castle Morpeth[3], Fylde[12]
Borough Councils[2]	57	0.38	2.021	Constant?	√	
Borough Councils[3]	51	0.417	1.769	Constant?	√	
District Councils[1]	102	0.537	2.409	Constant?	√	West Lancashire[123], Alnwick[123], Broadland[1], Teesdale[123], Ashfield[123]
District Councils[2]	83	0.534	2.43	Constant?	√	
District Councils[3]	81	0.546	2.414	Constant?	√	
Unitary Councils[1]	37	0.537	1.727	√	√	
Unitary Councils (infuential cases removed)[18]	36	0.646	1.78	√	√	
Unitary Councils[2]	24	0.815	1.934	√	√	Windsor and Maidenhead[1]
Unitary Councils[3]	29	0.822	1.88	√	√	
City Councils[1]	16	0.87	2.14	Constant?	?	
City Councils[2]	8	0.82	1.675	Constant?	x	
City Councils[3]	10	0.759	2.634	Constant?	√	None
Inner London Borough Councils[1]	8	0.623	1.481	√	√	
Inner London Borough Councils (influential cases removed)[10]	7	NS	1.283	Constant?	x	None
Outer London Borough Councils[1]	14	0.588	1.656	Constant?	x	Merton[1]
London Borough Councils[1]	22	0.541	1.384	Constant?	?	
London Borough Councils[2]	13	.439($p<.05$)	1.358	Constant?	√	
London Borough Council[3]	13	0.711	1.139	Constant?	?	Merton[1], Camden[2]
Metropolitan Borough Councils[1]	24	0.447	1.512	Constant?	√	
Metropolitan Borough Councils (influential cases removed)[18]	22	0.283	1.959	Constant?	√	
Metropolitan Borough Councils[2]	15	0.438	1.491	Constant?	x	
Metropolitan Borough Councils[3]	12	0.648	1.925	Constant?	√	Leeds[1], Sheffield[18]
Unitary & City Councils[1]	53	0.799	1.65	√	√	
Unitary & City Councils[2]	32	0.775	1.736	√	√	Rutland[123], Windsor & Maidenhead[123]
Unitary & City Councils[3]	39	0.775	1.917	√	√	
London & Metropolitan Borough Council[1]	46	0.347	1.127	Constant?	√	
London & Metropolitan Borough Council[2]	28	0.35	1.23	Constant?	√	
London & Metropolitan Borough Council[3]	25	0.497	1.091	X	√	Leeds[1], Sefton[3]

Table 6.6 – Key aspects of the results of regression model testing – predictor variable under 18 conceptions with full duty decisions 2003

6.1.3.1 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for borough Councils

The models explained between 49% and 50% of the variance in the outcome variable total decisions and between 38% and 44% for the outcome variable full duty decisions. The confidence intervals were reasonably tight for all samples and both dependent variables. However the intervals for the constant crossed zero for all models produced in this grouping for this predictor variable. This raised concerns about the stability of the models. The number of outlying cases was higher than expected but there were no cases exerting undue influence on the model. The Durbin-Watson figures were generally close to 2 suggesting the assumption of independence of errors had been satisfied. This was supported by the plots for the residuals which demonstrated independence, normal distribution and homoscedasticity.

6.1.3.2 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for district councils

The model explained between 49% and 52% of the variance in total decisions and between 53% and 55% for full duty decisions. The confidence intervals were good for the main sample grouping for total decisions. The intervals for the constant value crossed zero for both of the random sample grouping for both dependent variables as well as the full sample grouping for full duty decisions. Although the plots for the residuals demonstrated independence, normal distribution and homoscedasticity and the Durbin Watson figures were good for all models, the number of outlying cases was higher than expected. There were no cases exerting undue influence on the models. In the circumstances it was questionable whether the models produced using this predictor variable were reliable for predicting homeless decisions for district councils.

6.1.3.3 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for unitary councils

The models explained between 72% and 82% of the variance for total decisions and between 54% and 82% for full duty decisions. The confidence intervals were good for all samples and both dependent variables and the residuals demonstrated independence, normal distribution and homoscedasticity. The outlying cases were within expected parameters. Removing the case exerting undue influence had a significant effect for both dependent variables. For total decisions, the lowest proportion of variance dropped significantly but for full duty decisions, removal had the opposite effect, increasing the lowest proportion of variance explained by the predictor variable. This substantial and inconsistent effect of removing one case suggests the model is unreliable and invalid. This is supported by the large range of variance. This may be due to the sample size. Without further investigation it is difficult to check reliability of the models for this variable and this council grouping.

6.1.3.4 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for city councils

The model explained between 86% and 95% of the variance in total decisions and between 76% and 87% for full duty decisions. The confidence intervals were relatively tight for all samples and both dependent variables however the intervals for the constant value did consistently cross zero, albeit by very small amounts. It was difficult to determine whether the residuals met the assumptions necessary for robust regression due to the small sample sizes. It appeared that they failed to do so in sample A. No cases exerted undue influence and there was only one outlying case. Whilst the variance explained by this predictor variable was consistently high, the small sample size was not conducive to thorough assessment of the residuals and in some of the models the Durbin-Watson figures were approaching the boundaries of being acceptable. These areas of doubt as to the reliability of the regression model for this council type made it difficult to conclude whether or not this predictor variable was helpful for predicting homeless decisions.

6.1.3.5. Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for unitary & city councils combined

The models produced for all three samples were very similar to each other, explaining between 76% and 77% for total decisions and between 78% and 80% for full duty decisions. The confidence intervals and residual distribution were good for all models for each of the dependent variables. The R^2 values were more stable and acceptable than those for the individual council groups. The consistency of the level of variance explained by the predictor variable for this grouping suggested a very strong model for this council grouping.

6.1.3.6 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for inner London borough councils

Once again, it was not possible to run a regression for this group in the random samples as the group sizes were too small to produce meaningful results. Regression was run for the full sample grouping but failed to produce a significant model for either total decisions or full duty decisions.

6.1.3.7 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for outer London borough councils

The model explained 70% of the variance in total decisions and 59% for full duty decisions. These figures appeared to suggest a relatively strong model, but confidence intervals were questionable for both dependent variables, as was the distribution of the residuals. This is likely to be due to sample size but needs to be carefully considered when assessing reliability.

6.1.3.8 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for all London borough councils

Although significant models were produced for this group in all three of the samples, as with the previous predictor variable, the models were not consistent across the samples. There was wide variation in the amount of variance in the outcome variable explained by this predictor variable; ranging from 38% to 73% for total decisions and from 44% to 72% for full duty decisions. No cases exerted excessive influence on the models. The confidence intervals for the model produced for random sample A and total decisions were not good, crossing zero and displaying large variation. They were also far from ideal for all models produced for full duty decisions. Once again this lack of consistency may be due to the small sample sizes. In the absence of further testing, the wide variation across the samples raised questions about how reliable this variable was for predicting homeless decisions for London Boroughs.

6.1.3.9 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for metropolitan borough councils

The model explained between 44% and 63% of the variance in total decisions and between 44% and 65% for full duty decisions. However, the variance for full duty decisions was reduced to 28% when the influential cases were removed. Whilst this significant drop is likely to be due to the small sample sizes, it nevertheless increases the range in variation in the outcome variable to unacceptable levels. Although distribution of the residuals looked fine for the majority of the models, the confidence intervals in this grouping raised further concern. Most of the intervals were large and crossed zero suggesting an unreliable predicting tool.

6.1.3.10 Assessment of how effectively the models using the under 18 conception variable predict levels of homelessness decisions for London & metropolitan borough councils

The models for the three samples explained between 30% and 47% for total decisions and between 35% and 50% for full duty decisions. The confidence intervals were still questionable with the regrouping although the residual distribution appeared to be good for all models. Amalgamating the two groups did not significantly improve the models. More importantly, the large variance that still existed between the samples did not indicate a particularly stable model for predicting homeless decisions for this council grouping.

6.1.4 Overview of the regression models using the 'limiting long term illness' variable (logpoorhealth1) and homeless decisions for 2003 for the full sample and two random samples.

Regression analysis on the random samples for this predictor variable produced results that were consistent with the full sample results (detailed at **5.3.3.2**). This predictor variable explained between 62% and 65% of the amount of variance in total decisions and between 63% and 68% for full duty decisions. The confidence intervals for the beta values were good for both dependent variables. The Durbin-Watson figures were close to 2 in both random samples as well as in the full sample regression, for both outcome variables, suggesting the assumption of independence of errors had been satisfied in all three of the samples. The residual plots confirmed normal distribution of residuals and homoscedasticity in all three samples for both outcome variables. The random samples identified outliers already identified in the full sample and the number of outliers was generally lower than expected. The figures for Cook's distances indicated no individual cases having undue influence on the models. The model produced using this predictor variable appeared to be reliable. The results for the different council grouping are shown in the two tables below.

Key aspects of the regression model for the limiting long term illness variable regressed with total decisions	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	290	0.651	1.627	√	√	Fylde[12], Fareham[1], Melton[1], South Staffordshire[1] Malvern Hills[1], Breckland[1], Alnwick[23], Sefton[123], Rutland[23], Windsor & Maidehead[23], Westminster[2]
Random sample A ([2])	202	0.616	1.868	√	√	
Random sample B ([3])	197	0.633	1.851	√	√	
Borough Councils[1]	86	0.447	1.845	√	√	Fylde[12], Allerdale[1], Broxbourne[3], Castle Morpeth[3], Gedling[3]
Borough Councils[2]	56	0.449	2.403	√	√	
Borough Councils[3]	50	0.497	1.392	√	√	
District Councils[1]	104	0.433	1.976	√	√	Mansfield[11a2], South Bucks[11a2], Alnwick[11a23], West Somerset[1a], Harlow[1a], Aylesbury Vale[1a], Mole Valley[1a]
District Councils (influential cases removed)[1a]	102	0.481	1.876	√	√	
District Councils[2]	84	0.477	1.422	√	√	
District Councils[3]	82	0.482	2.367	√	√	
Unitary Councils[1]	37	0.696	1.974	√	√	Windsor and Maidenhead[11a23]
Unitary Councils (influential cases removed)[1a]	36	0.513	1.898	√	√	
Unitary Councils[2]	24	0.763	2.112	√	√	
Unitary Councils[3]	29	0.758	2.252	√	√	
City Councils[1]	16	0.834	2.421	√	√	Worcester[13]
City Councils[2]	8	0.773	1.463	constant?	?	
City Councils[3]	10	0.757	2.219	√	√	
Inner London Borough Councils[1]	8	NS	1.861	x	x	None
Inner London Borough Councils (influential cases removed)[1a]	7	NS	1.169	x	x	
Outer London Borough Councils[1]	14	0.532	1.366	√	√	Harrow[1]
London Borough Councils[1]	22	0.397	1.295	x	√	Westminster[1], Harrow[13]
London Borough Councils[2]	13	NS	1.246	x	√	
London Borough Council[3]	13	0.52	1.047	constant?	√	
Metropolitan Borough Councils[1]	25	0.439	1.588	constant?	?	Sefton[12], Walsall[1a], Wirral[1a]
Metropolitan Borough Councils[2]	16	0.469	1.989	x	√	
Metropolitan Borough Councils[3]	12	0.487 ($p<.05$)	1.72	constant?	x	
Unitary & City Councils[1]	53	0.717	1.997	√	√	Rutland[1], Windsor & Maidenhead[13], Worcester[13]
Unitary & City Councils[2]	32	0.709	1.964	√	√	
Unitary & City Councils[3]	39	0.73	2.144	√	√	
London & Metropolitan Borough Council[1]	47	0.191	1.027	x	√	Westminster[1], Sefton[123]
London & Metropolitan Borough Council[2]	29	0.229	1.366	x	√	
London & Metropolitan Borough Council[3]	25	0.253	1.411	x	√	

Table 6.7 – Key aspects of the results of regression model testing – predictor variable logpoorhealth1, limiting long term illness with total decisions 2003

Key aspects of the regression model for the limiting long term illness variable regressed with full duty decisions	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	289	0.683	1.734	√	√	Fylde[12], West Lancashire[123], Alnwick[123], Sefton[123], Rutland[123], Windsor & Maidenhead[123], Camden[123], Tower Hamlets[13], Westminster[12], Lambeth[12]
Random sample A ([2])	201	0.628	1.971	√	√	
Random sample B ([3])	197	0.664	1.853	√	√	
Borough Councils[1]	87	0.469	2.22	√	√	Fylde[12], North Warwickshire[123], Redditch[12], Castle Morpeth[123]
Borough Councils[2]	57	0.369	2.28	√	√	
Borough Councils[3]	51	0.512	1.82	√	√	
District Councils[1]	103	0.479	2.359	√	√	Alnwick[11a23], West Lancashire[1a], Teesdale[1a], Harlow[1a], Welyn Hatfield[1a]
District Councils influential cases removed[1a]	101	0.505	2.327	√	√	
District Councils[2]	84	0.477	1.422	√	√	
District Councils[3]	82	0.482	2.367	√	√	
Unitary Councils[1]	37	0.768	1.834	√	√	Windsor & Maidenhead[11a23], Poole[11a23]
Unitary Councils influential cases removed[1a]	36	0.613	1.773	√	√	
Unitary Councils[2]	24	0.787	1.679	√	√	
Unitary Councils[3]	29	0.796	1.942	√	√	
City Councils[1]	16	0.787	2.191	√	√	Winchester[1]
City Councils[2]	8	.617 ($p<.05$)	1.248	constant?	√	
City Councils[3]	10	0.764	2.709	√	√	
Inner London Borough Councils[1]	8	0.728	1.193	x	x	None
Inner London Borough Councils (influential cases removed)[1a]	7	NS	1.131	x	√	
Outer London Borough Councils[1]	14	0.623	1.786	√	√	None
London Borough Councils[1]	22	0.432	1.08	√	√	Merton[1]
London Borough Councils[2]	13	0.325 ($p<.05$)	1.293	x	√	
London Borough Council[3]	13	0.535	0.608	constant?	√	
Metropolitan Borough Councils[1]	24	0.427	1.563	constant?	?	Sefton[12]
Metropolitan Borough Councils (influential cases removed)[1a]	22	0.362	1.988	constant?	?	
Metropolitan Borough Councils[2]	15	0.444	1.669	x	√	
Metropolitan Borough Councils[3]	12	0.483 ($p<.05$)	1.783	x	√	
Unitary & City Councils[1]	53	0.754	1..729	√	√	Rutland[1], Windsor & Maidenhead[123], Poole[13], Liverpool[1]
Unitary & City Councils[2]	32	0.7	1.538	√	√	
Unitary & City Councils[3]	39	0.763	1.985	√	√	
London & Metropolitan Borough Council[1]	46	0.212	1.043	constant?	√	Sefton[123]
London & Metropolitan Borough Council[2]	28	0.252	1.23	constant?	√	
London & Metropolitan Borough Council[3]	25	0.247	1.127	constant?	√	

Table 6.8 – Key aspects of the results of regression model testing – predictor variable logpoorhealth1, limiting long term illness with full duty decisions 2003

6.1.4.1 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for borough councils

The models explained between 45% and 50% of the variance in total decisions and between 37% and 51% for full duty decisions. The confidence intervals were tight for all samples and both dependent variables for all models produced in this grouping for this predictor variable. Again, the number of outlying cases was well within expected limits and there were no cases exerting undue influence on the model. The Durbin-Watson figures were generally close to 2 suggesting the assumption of independence of errors had been satisfied. This was supported by the plots for the residuals which demonstrated independence, normal distribution and homoscedasticity. These results suggested that this predictor variable was more stable when predicting the total number of homeless decisions than when used to predict the number of full duty homeless decisions.

6.1.4.2 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for district councils

The model explained between 43% and 48% of the variance in total decisions and 48% for full duty decisions. The confidence intervals were good for all samples and both dependent variables and the residuals demonstrated independence, normal distribution and homoscedasticity. The number of outlying cases was well within expected parameters. When influential cases were removed from the full sample, the amount of variance explained by the regression model didn't change for total decisions and rose by just 2% for full duty decisions. This suggested a particularly robust model for this council type using this predictor variable.

6.1.4.3 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for unitary councils

The models explained between 70% and 76% of the variance in total decisions and between 77% and 80% for full duty decisions. Again, the confidence intervals were good for all samples and both dependent variables and the residuals demonstrated independence, normal distribution and homoscedasticity. The outlying cases were within expected parameters. Removing the one case exerting undue influence on the models for this group did significantly affect the results for both dependent variables. For total decisions the lowest percentage of variance dropped 19% to 51% and for full duty decisions, removal of the one case caused a drop of 15% to 61%. This substantial effect of removing one case suggests unreliability but again, the large change could easily be due to the limited sample size within this group. Without further investigation it is difficult to be conclusive about the reliability of the models for this predictor variable and this council grouping.

6.1.4.4 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for city councils

The models explained between 76% and 83% of the variance in total decisions and between 76% and 79% for full duty decisions. The model produced from random sample A for full duty decisions was only significant at $p<0.05$ and the confidence intervals for the constant value were questionable for both dependent variables. It was also difficult to determine whether or not the residuals satisfied the assumptions of independence, normal distribution and homoscedasticity for random sample A because of the very small sample size (only eight cases fell within this group for random sample A). The confidence intervals were good for the other samples and both dependent variables. There were no cases exerting undue influence on the models and the number of outlying cases was within acceptable limits.

6.1.4.5 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for unitary & city councils combined

The models produced for all three samples were very similar to each other, explaining between 71% and 73% for total decisions and between 70% and 76% for full duty decisions. The confidence intervals and residual distribution were good for all models for each of the dependent variables. The R^2 values were more stable and acceptable than those for the individual council groups. These results, and particularly the consistency of the level of variance explained by the predictor variable for this grouping, suggested a very strong model for this council grouping.

6.1.4.6 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for inner London borough councils

Once again, it was not possible to run a regression for this group in the random samples as the group sizes were too small to produce meaningful results.

Regression was run for the full sample grouping but failed to produce a significant model for total decisions. A significant regression coefficient was produced for full duty decisions, explaining 73% of the variance. However the confidence intervals for the beta values were unacceptable and residual analysis was problematic due to the small sample size. Removing the one case that exerted undue influence on the model produced a revised model that was not significant.

6.1.4.7 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for outer London borough councils

The model explained 53% of the variance in total decisions and 62% for full duty decisions. The confidence intervals were good for both dependent variables as was the distribution of the residuals for the models for this group. The Durbin-Watson figures were acceptable for both dependent variables but were approaching the lower limits of acceptability in both instances. These figures appeared to suggest a relatively strong model. However the small sample sizes were a cause for concern and need to be carefully considered when assessing the reliability of these models.

6.1.4.8 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for all London borough councils

Although significant models were produced for this group in two out of three of the samples, as with the previous predictor variable, the models for this council grouping were inconsistent across the samples. The variation in the amount of variance in the outcome variable explained by this predictor variable ranged from 40% to 52% for total decisions and from 43% to 54% for full duty decisions. The confidence intervals for all of the models in this group were not good; crossing zero and displaying large variation. The residual analysis was also of concern, with the Durbin-Watson figures hovering around the 1 value in all models and dropping beneath it for random sample B and full duty decisions. Once again this lack of consistency may be due to the small sample sizes involved but in the absence of further testing, these unacceptable confidence intervals and questionable residuals raised questions about how reliable this predictor variable was for predicting homeless decisions for the London Boroughs.

6.1.4.9 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for metropolitan borough councils

The model explained between 44% and 49% of the variance in total decisions and between 43% and 49% for full duty decisions. However, the models produced using random sample B were only significant at $p<0.05$. Additionally, for full duty decisions, the lower parameter for the R^2 value was reduced to 36% when the influential cases were removed from the sample. Whilst the range in percentage of variation in the outcome variable explained by the predictor variable appeared to be fairly acceptable on the face of things, the confidence intervals for all models in this grouping raised further concern. The intervals were large and crossed zero for most of the models suggesting an unreliable predicting tool for this council grouping, probably due to the small sample size.

It therefore seemed unlikely that this predictor variable produced a reliable model for predicting homeless decisions for Metropolitan Borough Councils.

6.1.4.10 Assessment of how effectively the models using the limiting long term illness variable predict levels of homelessness decisions for London and metropolitan borough councils

The models produced for the three samples were reasonable close to each other, explaining between 19% and 25% for total decisions and between 21% and 25% for full duty decisions. Although these results were relatively consistent, the confidence intervals were still of concern, particularly for total decisions. The residual distribution was good for all models for each of the dependent variables which was an improvement on the results from the individual council groups. The questionable confidence intervals for the constant value make it unclear as to whether this variable provides for a stable model for predicting homeless decisions for this council grouping. In any event, the percentage of variance in the outcome variable explained by this predictor is a lot less than some of the other predictors tested. It's usefulness is therefore likely to be limited.

6.1.5 Overview of the regression models using the 'Job Seekers' Allowance' variable (logpoverty3) and homeless decisions for 2003 for the full sample and two random samples.

When regression was run on the two separate random samples for this predictor variable the results were consistent with the full sample results (detailed in the previous chapter at **5.3.3.6**). The models explained between 65% and 67% of the amount of variance in total decisions and between 64%

and 67% for full duty decisions. This consistency suggests reliability; however the confidence intervals for the constant value are not so supportive, crossing zero in four out of the six models produced for this predictor variable. This suggests instability within the model and consequently raises concerns over the reliability. The residual analysis gave no cause for concern with the Durbin-Watson figures staying close to 2 in all three samples, for both outcome variables, suggesting the assumption of independence of errors was satisfied. This suggestion was further supported by the residual plots which confirmed homoscedasticity in all three samples for both outcome variables. The random samples identified outlying cases already identified in the full sample and the number of cases fell within expected and acceptable limits. The figures for Cook's distances indicated no individual cases as having an undue influence on the models. The regression analysis run for the different types of Council in each of the three samples showed wide differences between council types and these results are shown in the tables over page:

Key aspects of the regression model for the 'Job Seekers' Allowance' variable regressed with total decisions	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	289	0.671	1.736	√	√	Gravesham[13], Fylde[1], Fareham[1], Richmond upon Thames[1], West Lindsey[1], Teesdale[23], Castle Morpeth[23], Rutland[23], Alnwick[23], Windsor & Maidenhead[123], Sefton[123], North Dorset[2], South Bucks[2], South Staffordshire[1], Breckland[1], Melton[1], Taunton Deane[1], Enfield[1], Sandwell[1]
Random sample A ([2])	201	0.671	1.979	Constant?	√	
Random sample B ([3])	196	0.65	1.914	√	√	
Borough Councils[1]	86	0.379	1.779	Constant?	√	Fylde[12], Gravesham[1], Castle Morpeth[123], Berwick upon Tweed[1], Allerdale[1], Barrow in Furness[2]
Borough Councils[2]	56	0.453	1.865	Constant?	√	
Borough Councils[3]	50	0.298	1.286	√	√	
District Councils[1]	103	0.349	1.996	√	√	Alnwick[123], Teesdale[123], South Bucks[12], Mansfield[12], East Lindsey[13].
District Councils[2]	84	0.361	2.288	√	√	
District Councils[3]	82	0.271	2.141	√	√	
Unitary Councils[1]	37	0.648	1.916	Constant?	√	Middlesborough[3], Windsor and Maidenhead[11a23], Kingston upon Hull[1]
Unitary Councils influential cases removed[1a]	36	0.481	2.008	Constant?	√	
Unitary Councils[2]	24	0.751	1.652	Constant?	√	
Unitary Councils[3]	29	0.709	1.706	Constant?	√	
City Councils[1]	16	0.852	2.628	Constant?	?	None
City Councils[2]	8	0.91	2.946	Constant?	x	
City Councils[3]	10	0.717	2.382	Constant?	x	
Inner London Borough Councils[1]	8	NS	1.968	X	?	None
Inner London Borough Councils (influential cases removed)[1a]	7	NS	1.358	X	?	
Outer London Borough Councils[1]	14	0.588	1.355	Constant?	?	Harrow[1]
London Borough Councils[1]	22	0.556	1.572	√	√	Harrow[1], Merton[12], Hillingdon[3]
London Borough Councils[2]	13	0.557	1.875	Constant?	√	
London Borough Council[3]	13	0.639	1.842	√	?	
Metropolitan Borough Councils[1]	25	0.2	1.539	X	?	Sefton[1], Sheffield[1a]
Metropolitan Borough Councils[2]	16	0.263 (p<.05)	1.69	X	√	
Metropolitan Borough Councils[3]	12	0.712	2.491	Constant?	?	
Unitary & City Councils[1]	53	0.713	2.041	Constant?	√	Rutland[1], Windsor & Maidenhead[13], Worcester[1], Middlesborough[13], Milton Keynes[1], Kingston upon Hull[1]
Unitary & City Councils[2]	32	0.742	1.621	Constant?	√	
Unitary & City Councils[3]	39	0.71	1.807	X	√	
London & Metropolitan Borough Council[1]	47	0.287	1.401	√	√	Sefton[123], Walsall[1], Leeds[1]
London & Metropolitan Borough Council[2]	29	0.33	1.643	Constant?	√	
London & Metropolitan Borough Council[3]	25	0.37	1.657	X	√	

Table 6.9 – Key aspects of the results of regression model – predictor variable Job Seekers' Allowance Income Based, logpoverty3 with total decisions 2003

Key aspects of the regression model for the 'Job Seekers' Allowance' variable regressed with full duty decisions	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	288	0.673	1.725	√	√	North Warwickshire[123], Leeds[123], Alnwick[123], Teesdale[123], Gravesham[13] Castle Morpeth[123], Berwick upon Tweed[1], West Lancashire[123], North Dorset[1], Allerdale[1], Welwyn Hatfield[1], Ashfield[1], Rutland[123], Windsor & Maidenhead[123], Sefton[123], North Dorset[2]
Random sample A ([2])	200	0.637	1.901	√	√	
Random sample B ([3])	196	0.635	1.764	Constant?	√	
Borough Councils[1]	87	0.314	1.866	√	√	Fylde[12], North Warwickshire[123], Gravesham[13], Castle Morpeth[123], Berwick upon Tweed[1]
Borough Councils[2]	57	0.318	1.717	√	√	
Borough Councils[3]	51	0.193	1.349	√	√	
District Councils[1]	102	0.3	2.175	√	√	Alnwick[123], Teesdale[123], West Lancashire[123]
District Councils[2]	83	0.278	2.216	√	√	
District Councils[3]	81	0.28	2.173	√	√	
Unitary Councils[1]	37	0.701	1.242	Constant?	√	Rutland[1], West Berkshire[13], Windsor and Maidenhead[1], Kingston upon Hull[1]
Unitary Councils influential cases removed[1a]	36	0.554	1.314	Constant?	√	
Unitary Councils[2]	24	0.783	1.355	Constant?	√	
Unitary Councils[3]	29	0.731	1.043	Constant?	√	
City Councils[1]	16	0.847	2.37	Constant?	?	None
City Councils[2]	8	0.87	2.506	Constant?	x	
City Councils[3]	10	0.725	2.625	Constant?	√	
Inner London Borough Councils[1]	8	0.821	2.095	Constant?	?	None
Inner London Borough Councils (influential cases removed)[1a]	7	0.823	1.052	Constant?	√	
Outer London Borough Councils[1]	14	0.543	1.506	Constant?	√	Merton[1]
London Borough Councils[1]	22	0.709	2.086	Constant?	?	Merton[12], Hillingdon[3]
London Borough Councils[2]	13	0.699	2.719	Constant?	√	
London Borough Council[3]	13	0.802	2.844	Constant?	?	
Metropolitan Borough Councils[1]	24	0.276	1.476	Constant?	√	Sefton[1], Leeds[1]
Metropolitan Borough Councils[2]	15	.313 ($p<.05$)	1.527	Constant?	√	
Metropolitan Borough Councils[3]	12	.393 ($p<.05$)	1.852	Constant?	√	
Unitary & City Councils[1]	53	0.753	1.523	Constant?	√	Rutland[12], Windsor & Maidenhead[123], West Berkshire[13], Liverpool[2]
Unitary & City Councils[2]	32	0.766	1.329	Constant?	√	
Unitary & City Councils[3]	39	0.73	1.293	X	√	
London & Metropolitan Borough Council[1]	46	0.435	1.569	Constant?	√	Sefton[123], Leeds[12]
London & Metropolitan Borough Council[2]	28	0.459	1.758	Constant?	√	
London & Metropolitan Borough Council[3]	25	0.506	1.747	Constant?	√	

Table 6.10 – Key aspects of the results of regression model testing – predictor variable Job Seekers' Allowance Income Based, logpoverty3 with full duty decisions 2003

6.1.5.1 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for borough Councils

The models explained between 30% and 45% of the variance in total decisions and between 19% and 32% for full duty decisions. These wide ranges in variation in outcome variable explained by the predictor variable suggested instability in the models. The confidence intervals were reasonably tight for all samples and both dependent variables for all models produced in this grouping for this predictor variable. However, for total decisions, the confidence intervals for the constant value did cross zero, albeit only be very small margins. This raised further questions over the stability of the models. The numbers of outlying cases were generally at expected levels and there were no cases exerting undue influence on the model. The Durbin-Watson figures were close to 2 for the models generated using the full sample and random sample A but were closer to 1 for the models resulting from random sample B, suggesting the assumptions of independence and normal distribution of errors may not have been satisfied. The plots for the residuals did however appear to demonstrate independence, normal distribution and homoscedasticity. The wide range in the variance in the outcome variable explained by this predictor variable, coupled with the instability within the models suggested that this was not a good predictor of homeless decisions for this type of council.

6.1.5.2 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for district councils

The model explained between 27% and 36% of the variance in total decisions and between 28% and 30% for full duty decisions. The confidence intervals were good for all samples and both dependent variables and the residuals demonstrated independence, normal distribution and homoscedasticity. There were no cases exerting undue influence on the models and the number of outlying cases was few in number and within expected parameters. These results suggest that this predictor variable provided for a reliable, if not particularly powerful, model for this council type.

6.1.5.3 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for unitary councils

The models explained between 65% and 75% of the variance in total decisions and between 70% and 78% for full duty decisions. The outlying cases were within expected parameters. Removing the one case exerting undue influence on the models for this group had a significant effect for both dependent variables. For total decisions the minimum variance dropped 17% to 48% and dropped 15% to 55% for full duty decisions. This substantial effect of removing one case suggests unreliability but again, the large change may be due to the limited sample size within this group. The confidence intervals were however questionable for all models produced for this predictor variable, with the intervals for the constant values consistently crossing zero. Although the residuals demonstrated independence, normal distribution and homoscedasticity, the models appeared to be unstable. Without further investigation it was difficult to be conclusive about the reliability of the models for this predictor variable and this council grouping.

6.1.5.4 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for city councils

The models explained between 72% and 91% of the variance in total decisions and between 73% and 87% for full duty decisions. The confidence intervals for the constant value were questionable for both dependent variables. It was again difficult to determine whether or not the residuals satisfied the assumptions of independence, normal distribution and homoscedasticity for the various samples because of the very small sample size. There were no cases exerting undue influence on the models and the number of outlying cases was within acceptable limits. The wide range of variance, the questionable confidence intervals and the unclear picture of the residuals led to the conclusion that this predictor variable did not produce a reliable model for this council type.

6.1.5.5 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for unitary & city councils combined

The models produced for all three samples were very similar to each other, explaining between 71% and 74% for total decisions and between 73% and 77% for full duty decisions. The confidence intervals were still questionable for both dependent variables, crossing zero for the constant value. The residual distribution was good for all models for each of the dependent variables. The R^2 values were more stable and acceptable than those for the individual council group types but the confidence intervals for the constant shed doubt on whether these models provided a reliable model for this council grouping.

6.1.5.6 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for inner London borough councils

Again, it was not possible to run a regression for this group in the random samples as the group sizes were too small to produce meaningful results. Regression was run for the full sample grouping but failed to produce a significant model for total decisions. A significant regression coefficient was produced for full duty decisions, explaining 82% of the variance in the outcome variable. However the confidence intervals for the beta values were unacceptable and residual analysis was problematic due to the small sample size. Removing the one case that exerted undue influence on the model produced a revised significant model with residuals that satisfied the assumptions but the confidence intervals for the constant value were still very questionable. Without being able to compare these results with other, larger samples, it remained unclear as to whether this predictor variable produced a reliable model for this council type.

6.1.5.7 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for outer London borough councils

The model explained 59% of the variance in total decisions and 54% for full duty decisions. However, the confidence intervals for the constant value crossed zero for the models for each of the dependent variables. The distribution of the residuals was questionable for the model for total decisions but looked quite acceptable for the model for full duty decisions. The Durbin-Watson figures were acceptable for both dependent variables but were a little low in both instances. The figures appear to suggest a reasonably strong model but the confidence intervals suggest that it might not be particular stable. The small sample sizes are certainly a cause for concern and need to be carefully considered when assessing the reliability of these models.

6.1.5.8 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for all London borough councils

Significant models were produced for this group in all of the samples, and the models for this council grouping were fairly consistent across the samples. The variation in the amount of variance in the outcome variable explained by this predictor variable ranged from 57% to 64% for total decisions and from 70% to 80% for full duty decisions. The confidence intervals for the constant values for all of the models for full duty decisions in this group crossed zero as did those for the model produced from random sample A. The distribution of the residuals appeared to be acceptable in most cases but the small sample sizes and the lack of other samples available for comparison meant that it was not possible to confirm satisfaction of the assumptions of a robust regression model. As a consequence, it was not possible to confirm whether or not this predictor variable produced a good model for predicting homeless decisions for the London Boroughs.

6.1.5.9 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for metropolitan borough councils

The full sample and random sample A both produced models that explained similar proportions of the variance in both of the outcome variables. However the proportions of variance in the outcome variables explained by the models for random sample B were much, much higher, particularly for total decisions. Further, both the models produced by the random samples for full duty decisions were only significant at $p<.05$. This was also the case for the model produced by random sample A and total decisions. The confidence intervals were unacceptable for the models produced for total decisions, with the intervals crossing zero for both the value for the predictor variable and the constant. Although the confidence intervals were better for full duty decisions, the parameters for the constant value still crossed zero, suggesting highly unreliable models. Analysis of the residuals also raised concerns over whether the assumptions of regression had been satisfied. Again, these results may be as a result of the sample sizes verging on unacceptable levels. Nonetheless, the wide variation in the models, the poor confidence limits and the concerns over distribution of the residuals suggested that this predictor variable was not reliable for predicting homeless decisions for Metropolitan Borough Councils.

6.1.5.10 Assessment of how effectively the models using the Job Seekers' Allowance' variable predict levels of homelessness decisions for London and metropolitan borough councils

The models produced for the three samples explained between 29% and 37% for total decisions and between 44% and 51% for full duty decisions. Although these results were relatively consistent, the confidence intervals were questionable despite being an improvement on the individual council groups. The residual distribution was good for all models. This variable provides for a reasonably stable and valid model for predicting homeless decisions, particularly full duty decisions, for this council grouping.

6.1.6 Overview of the regression models using the 'mixed race' variable (logethnicity2) and homeless decisions for 2003 for the full sample and two random samples.

When regression was run on the two random samples for this predictor the results were consistent with the full sample results (detailed at **5.3.3.4**). The models explained between 48% and 50% of the amount of variance of total decisions and between 53% and 58% of full duty decisions. The confidence intervals for the beta values were generally good and the Durbin-Watson figures stayed close to 2 in all the samples, for both outcome variables, suggesting the assumption of independence of errors had been satisfied in all three of the samples. This was further supported by the residual plots which confirmed normal distribution and homoscedasticity in all three samples for both outcome variables. The random samples identified outlying cases that had not already been identified in the full sample and the number of outlying cases was just outside of expected levels. However, the figures for Cook's distances indicated no individual cases as having an undue influence on the models. These results and the small ranges in variance suggest that this predictor variable produced a reasonably reliable regression model for homelessness decisions and the comparisons are shown in the tables over page:

Key aspects of the regression model for the 'mixed race' variable regressed with total decisions	Sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	290	0.5	1.6	√	√	
Random sample A ([2])	202	0.482	1.848	√	√	
Random sample B ([3])	197	0.488	1.896	√	√	Barrow in Furness[1,2,3], Aylesbury Vale[2,3], Mansfield[2], Hyndburn[1], Fylde[1,2], Runnymede[2], Isles of Scilly[2,3], Melton[1], Alnwick[2,3], South Staffordshire[1], Solihull[1], Sefton[1], Epsom & Ewell[1,2], Rutland[2,3], Mole Valley[3], Broxtowe[1], Tonbridge & Malling[1], Thurrock[1], Windsor & Maidenhead[2,3], Wigan[2], Easington[3], South Bucks[2], Fareham[1]
Borough Councils[1]	86	0.174	1.699	√	√	
Borough Councils[2]	56	0.116	1.932	√	√	
Borough Councils[3]	50	0.163	1.591	√	√	Barrow in Furness[1,2,3], Fylde[1,2], Runnymede[1,2], Epsom & Ewell[1,2], Melton[3], Castle Morpeth[3]
District Councils[1]	104	0.174	1.882	√	√	
District Councils influential cases removed[1a]	102	0.088	1.833	√	√	
District Councils[2]	85	0.289	2.294	√	√	
District Councils[3]	83	0.271	2.141	√	√	Mansfield[1,1a,2], South Bucks[1,2,1a], Mole Valley[1,1a], Alnwick[1,2,3,1a], Teesdale[1a], East Lindsey[1,1a,3], Isles of Scilly[1,2,3,1a], Easington[3], Mole Valley[3]
Unitary Councils[1]	37	0.226	1.574	Constant?	√	
Unitary Councils influential case removed[1a]	36	0.106	1.613	X	√	
Unitary Councils[2]	24	0.301	1.47	Constant?	?	
Unitary Councils[3]	29	0.3	1.745	X	√	Windsor and Maidenhead[1,1a,2,3], Rutland[1,1a,2,3]
City Councils[1]	16	0.678	2.255	Constant?	?	
City Councils[2]	8	0.85	1.9	Constant?	√	
City Councils[3]	10	.434 ($p<.05$)	1.6	Constant?	x	None
Inner London Borough Councils[1]	8	NS	1.335	X	x	Kensington & Chelsea[1]
Outer London Borough Councils[1]	14	0.492	1.151	Constant?	√	Harrow[1]
London Borough Councils[1]	22	0.433	1.293	Constant?	√	
London Borough Councils[2]	13	0.318	2.356	Constant?	x	
London Borough Council[3]	13	.378 ($p<.05$)	1.703	Constant?	√	Harrow[1,3]
Metropolitan Borough Councils[1]	25	0.33	1.425	√	√	
Metropolitan Borough Councils[2]	16	.325 ($p<.05$)	1.768	Constant?	√	
Metropolitan Borough Councils[3]	12	0.721	2.491	Constant?	?	Walsall[1], Sheffield[1]
Unitary & City Councils[1]	53	0.368	1.686	Constant?	√	
Unitary & City Councils[2]	32	0.369	1.585	X	√	
Unitary & City Councils[3]	39	0.299	1.691	X	√	Rutland[1,2,3], Windsor & Maidenhead[1,2,3]
London & Metropolitan Borough Council[1]	47	0.266	1.11	√	√	
London & Metropolitan Borough Council[2]	29	0.182	1.319	√	√	
London & Metropolitan Borough Council[3]	25	0.388	1.334	√	√	Harrow[1,3], Sheffield[1], Leeds[1,2,3]

Table 6.11 – Key aspects of the results of regression model testing – predictor variable 'mixed race', logethnicity2 with total decisions 2003

Logethnicity2 with full duty decisions	sample size	value of R^2	Durbin-Watson	Confidence intervals	residuals	Outlying cases
Full sample([1])	289	0.552	1.712	√	√	Hertsmere[12], Sedgefield[1], Fylde[1], Runnymede[12], Epsom & Ewell[12], Easington[13], South Bucks[12], Isles of Scilly[123], Alnwick[123], Rutland[123], Redcar & Cleveland[1], Windsor & Maidenhead[123], Merton[12], Leeds[123], Wigan[2]
Random sample A ([2])	201	0.533	1.898	√	√	
Random sample B ([3])	197	0.575	1.918	constant?	√	
Borough Councils[1]	87	0.227	1.828	√	√	Mansfield[1], South Bucks[1], Mole Valley[1], Isles of Scilly[1], Alnwick[1], East Lindsey[1], Fylde[2], Runnymede[2], Hertsmere[2], Epsom & Ewell[2], North Warwickshire[3],Amber Valley[3], Castle Morpeth[3]
Borough Councils[2]	57	0.19	1.815	√	√	
Borough Councils[3]	51	0.373	1.898	√	√	
District Councils[1]	103	0.306	2.179	√	√	South Bucks[12], Isles of Scilly[123], Alnwick[123], Harborough[1a], Teesdale[1a], Easington[3]
District Councils (influential cases removed)[1a]	101	0.173	2.086	√	√	
District Councils[2]	84	0.366	2.42	constant?	√	
District Councils[3]	82	0.358	2.282	constant?	√	
Unitary Councils[1]	37	0.275	1.171	constant?	√	Windsor and Maidenhead[11a23], Rutland[11a23]
Unitary Councils (influential cases removed)[1a]	36	0.154	1.158	√	√	
Unitary Councils[2]	24	0.315	1.265	constant?	√	
Unitary Councils[3]	29	0.373	1.324	constant?	√	
City Councils[1]	16	0.685	2.627	constant?	?	None
City Councils[2]	8	0.914	2.774	constant?	√	
City Councils[3]	10	.530($p<.05$)	1.325	constant?	?	
Inner London Borough Councils[1]	8	NS	1.608	x	x	Kensington & Chelsea[1]
Outer London Borough Councils[1]	14	0.487	1.332	constant?	?	Merton[1]
London Borough Councils[1]	22	0.4	1.565	constant?	√	Tower Hamlets[1], Merton[12]
London Borough Councils[2]	13	.441($p<.05$)	2.356	constant?	x	
London Borough Council[3]	13	.368($p<.05$)	1.732	constant?	√	
Metropolitan Borough Councils[1]	24	0.473	0.989	constant?	√	Leeds[1], Walsall[1],Sheffield[1], Sefton[3]
Metropolitan Borough Councils[2]	15	0.487	1.478	constant?	√	
Metropolitan Borough Councils[3]	12	0.788	2.079	constant?	√	
Unitary & City Councils[1]	53	0.418	1.483	constant?	√	Rutland[13], Windsor & Maidenhead[123]
Unitary & City Councils[2]	32	0.39	1.371	x	√	
Unitary & City Councils[3]	39	0.374	1.305	constant?	√	
London & Metropolitan Borough Council[1]	46	0.28	0.953	√	√	Merton[12], Leeds[123], Harrow[3]
London & Metropolitan Borough Council[2]	28	0.236	1.142	√	√	
London & Metropolitan Borough Council[3]	25	0.39	1.2	√	√	

Table 6.12 – Key aspects of the results of regression model testing – predictor variable 'mixed race', logethnicity2 with full duty decisions 2003

6.1.6.1 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for borough Councils

The models explained between 12% and 17% of the variance in total decisions and between 19% and 37% for full duty decisions. This wide range in variation in full duty decisions suggests instability in the model. However the confidence intervals were reasonably tight for all samples and both dependent variables for all models produced in this grouping for this predictor variable. The numbers of outlying cases were generally at expected levels and there were no cases exerting undue influence on the model. The Durbin-Watson figures were close to 2 for all models, suggesting the assumptions of independence and normal distribution of errors were satisfied. The plots for the residuals supported the view that the residuals were independent, normal distributed and demonstrating homoscedasticity. These results suggested that this predictor variable produced a fairly robust model for this council type for total decisions but that there may be instability when used for modelling full duty decisions.

6.1.6.2 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for district Councils

The model explained between 17% and 29% of the variance in total decisions and between 31% and 37% for full duty decisions. The confidence intervals and distribution of residuals were all encouraging for total decisions. This was not the case for full duty decisions where the confidence intervals for the constant value crossed zero for both of the random samples. Although the plots for the residuals demonstrated independence, normal distribution and homoscedasticity and the Durbin Watson figures were good for all models, the number of outlying cases was higher than expected. There was one case exerting undue influence on the models so the regressions were run again excluding this case. The revised models explained much less variance in the outcome variable than the models including this case. The amount of variance explained by the predictor variable was reduced to 9% for total decisions and to 17% for full duty decisions. In the circumstances it is unlikely that the models produced using this predictor variable are reliable for predicting homeless decisions for district councils.

6.1.6.3 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for unitary Councils

The models explained between 23% and 30% of the variance in total decisions and between 28% and 37% for full duty decisions. The confidence intervals were unacceptable for total decisions, crossing zero and having a large range. They were a little better for full duty decisions but were still sufficiently large to cause concern. The residuals demonstrated independence, normal distribution and homoscedasticity for both dependent variables. The outlying cases were within expected parameters. Removing the one case exerting undue influence on the models for this group had a significant effect for both dependent variables. The minimum figure for variance in the outcome variable explained by the predictor dropped to 11% for total decisions and to 15% for full duty decisions. This substantial effect of removing one case suggests unreliability but again, the large change may be due to the limited sample size within this group. Without further investigation it is difficult to be conclusive about the reliability of the models for this predictor variable and this council grouping.

6.1.6.4 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for city councils

The models for the full sample and for random sample A explained between 68% and 85% of the variance in total decisions and between 69% and 91% for full duty decisions. Random sample B did produce a significant model but only at $p<.05$ and this model explained much less of the variance in the outcome variable (43% and 53% for total decisions and full duty decisions respectively). However, this wide inconsistency is probably explained by the very small sample sizes for this council group. The confidence intervals for the constant value were questionable for both dependent variables. It was again difficult to determine whether or not the residuals satisfied the assumptions of independence, normal distribution and homoscedasticity for the various samples because of the very small sample size. There were no cases exerting undue influence on the models and the number of outlying cases was within acceptable limits. The results for these small samples, the wide range of variance, the questionable confidence intervals and the unclear picture regarding the residuals led to the conclusion that this predictor variable was not helpful for this council type.

6.1.6.5 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for unitary & city councils combined

The models produced for all three samples were very similar to each other, explaining between 30% and 37% for total decisions and between 37% and 42% for full duty decisions. The confidence intervals were still questionable for all models. Although the residual distribution was good for all models, for each of the dependent variables, the wide confidence intervals for the constant value did not suggest a reliable model for this council grouping.

6.1.6.6 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for inner London borough councils

It was not possible to run a regression for this group in the random samples as the group sizes were too small to produce meaningful results. Regression was run for the full sample grouping but failed to produce a significant model for either dependent variable.

6.1.6.7 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for outer London borough councils

The model explained 49% of the variance in both total decisions and full duty decisions. However, the confidence intervals for the constant value crossed zero for the models for each of the dependent variables. The distribution of the residuals was questionable for the model for full duty decisions but looked quite acceptable for the model for total decisions. The Durbin-Watson figures were acceptable for both dependent variables but were a little low in both instances. The figures appear to suggest a relatively strong but not particular stable model. The small sample sizes were again, a cause for concern.

6.1.6.8 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for all London borough councils

Significant models were produced for this group in all of the samples, and the models for this council grouping were fairly consistent across the samples. The variation in the amount of variance in the outcome variable explained by this predictor variable ranged from 32% to 43% for total decisions and from 37% to 44% for full duty decisions. However the models produced for this group from the random samples were only significant at $p<.05$. The confidence intervals for the constant values for all of the models in this group crossed zero. The distribution of the residuals appeared to be acceptable in most cases but the small sample sizes and the lack of other samples available for comparison meant that it was not possible to confirm satisfaction of the assumptions of a robust regression model. As a consequence, it was not possible to confirm whether or not this predictor variable produced a good model for predicting homeless decisions for the London Boroughs.

6.1.6.9 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for metropolitan borough councils

The full sample and random sample A both produced models that explained similar proportions of the variance in both of the outcome variables. However the proportions of variance in the outcome variables explained by the models for random sample B were much, much higher, particularly for total decisions. Further, both the models produced by the random samples for full duty decisions were only significant at $p<.05$. This was also the case for the model produced by random sample A and total decisions. The confidence intervals were unacceptable for the models produced for total decisions, with the intervals crossing zero for both the value for the predictor variable and the constant. Although the confidence intervals were better for full duty decisions, the parameters for the constant value still crossed zero, suggesting highly unreliable models. Analysis of the residuals also raised concerns over whether the assumptions of regression had been satisfied. These results may be as a result of the sample sizes verging on unacceptable levels. Nonetheless, the wide variation in the models, the poor confidence limits and the concerns over distribution of the residuals suggested that this predictor variable was not reliable for predicting homeless decisions for Metropolitan Borough Councils.

6.1.6.10 Assessment of how effectively the models using the 'mixed race' variable predict levels of homelessness decisions for London & metropolitan borough councils

The models produced for the three samples explained between 18% and 39% for total decisions and between 24% and 39% for full duty decisions. The confidence intervals and the residual distribution appeared to be good for all models, but the large variance that still existed between the samples did not indicate a particularly stable model for predicting homeless decisions for this council grouping.

6.2 Critical analysis

As can be seen from the above results there would seem to be various reliable and valid models that could be used to help predict levels of homelessness. Some models appear to be stronger than others, such as social disadvantage factor scores with full duty decisions explaining between 80% and 85% of full duty homeless decisions for city councils. Other models may be able to explain less variance in the outcome variable but appear more reliable in doing so; such as the poor health variable with full duty decisions, consistently explaining between 21% and 25% of the number of full duty homeless decisions for London & Metropolitan Borough Councils. In all of the models produced and assessed the adjusted R^2 figure was consistently close to the R^2 value confirming cross validation of the models with the population. However assessment of the usefulness and efficacy of the various forecast models requires consideration of a number of issues and each of these is discussed below.

Firstly the degree of accuracy required. Ideally, the models with the smallest standard error of the beta values would be the most appropriate as such models would minimise the chances of underestimating or overestimating the outcome variable. The models produced by using social disadvantage factor scores are generally the ones with the smallest standard errors; however these models are not the most accessible of the models available. Whilst the other models are not quite as good, in terms of the amount of variance explained or the size of the standard errors for the beta values, they still appear to be very reliable and much more accessible than the models produced for social disadvantage factor scores.

Secondly, the forecast horizon needs to be considered as different models are suitable for different time periods. Generally, the models produced predict levels of decisions on homelessness two years into the future. However, models produced by the poverty variable could, in theory, predict levels of homelessness three years into the future. Further, the levels of correlation between the predictor variables and the outcome variables were consistently high for all of the predictor variables for the period studied – four years after the date of the data for the predictor variables – it may therefore be reasonable to suggest that these models could prove to be valid for up to a four year period. Beyond this time frame these models are not tested and consequently could not be relied upon at this time. There is nevertheless, the potential for further testing of these variables with a view to assessing their effectiveness as forecasting tools for each year. Whilst it is a reasonable hypothesis that their effectiveness might diminish as the date of the predictor variable data distances from the time period being tested, the variables may still provide robust and reliable models year on year, several years in to the future, albeit possibly with a reduced R^2.

Thirdly, the cost of producing the forecasts also needs to be considered when assessing the appropriateness of the models. If it takes a significant amount of time and resources to search for and use the relevant data to obtain the forecasts, Local Authorities will be reluctant to engage with the idea of modelling. The more complex and technical the model, the less useable it will be for Local Authorities. If a model is not going to be used, there is little point in it being there in the first place. All of the data used in the production of the models is already in the public arena and accessible to anyone with access to a computer and the internet. For all of the models except for those generated by social disadvantage factor scores the information required to produce a reliable and valid forecast should be easy and quick for Local Authorities to obtain.

Forecasts can be obtained by a few simple calculations using a calculator. The models generated by using social disadvantage factor scores will require a higher level of technical competence and experience as well as specialist software to execute effectively. Consequently, these models are likely to be more costly in terms of resources required to put into practice

Fourthly, the degree of complexity required. There is no need or desire to make forecasting levels of homelessness a complex issue. On the contrary, the intention would be to make forecasting as simple as possible. Local Authorities currently have no objective, reliable or valid tools to help predict future levels of homelessness. If these models were able to help produce even a 'ballpark' figure from which to base further strategic planning, objectivity in day-to-day practice in the strategic planning of homeless services would be improved. Ideally, the model should be as simple as possible whilst still maintaining stability and reliability. Such an argument obviously favours the use and promotion of the models using one 'raw' predictor variable over the models using the more complex variable 'social disadvantage factor scores'. The model using social disadvantage factor scores would require more recent calculations to provide a meaningful model for prediction. Alternatively, Local Authorities would need access to the data on five different social issues, knowledge of factor analysis to obtain new social disadvantage factor scores for the time periods being used for prediction purposes as well as knowledge of multiple regression techniques to obtain revised beta values. It would obviously be simpler for Central Government to calculate these values and disseminate them to Local Authorities for use in the planning processes.

Another issue that needs consideration in evaluation of the various models produced is the fact that the power of the models does seem to vary depending on council type, sometimes by quite a significant amount of variance. For example, the model produced using the social disadvantage factor score produced an R^2 value of between 80 and 85% for city councils but only an R^2 value of between 43 and 46% for district councils. It is not immediately clear why this should be the case. It might be explained by the fact that district councils may be responsible for a more diverse area than city councils, in terms of geography, infrastructure and opportunity, and population but this is purely speculative. The fact that the models differ depending on council type would appear to be an issue worthy of further research but arguably does not detract from their reliability in this context. The value of R^2 in the models is still generally consistent for each of the council types within the different samples taken. In the example above, there was only 5% difference in the amount of variance in the outcome variable explained by the predictor variable for city councils and only 3% for the models produced for district councils. Such small margins between the R^2 values produced using the different samples arguably suggest that the variables provide a robust and reliable model.

6.3 Limitations and usability of the model

This research has produced models based on data that is appropriate to the subject matter and available for analysis. The majority of the data utilised are however sourced from the census. By definition, this datum is only available every ten years and there is a delay in data availability after the census has been undertaken. The correlations between the independent variables and the dependent variables do appear to be consistent for a four year period after the date of the data. The models would therefore appear to be useable until the mid years of the decade. However, unless the data on the various predictor variables is obtainable from sources other than the census, prediction in the later half of the decade would be difficult.

Looking at possible data sources revealed a lack of availability of data in areas that the literature review indicated as often being key precedents to homelessness. Specifically, in the area of deinstitutionalisation, there were few, if any, useable data sets. Additionally, data on poor mental health and some subgroups of deinstitutionalisation was not easily accessible or useable for the purposes of this research. If alternate sources of suitable data were available, it would open the possibility of producing other reliable models that could be useful across other time periods. If better data were available revised models could potentially be produced that would arguably be useable at any point in time. The data collected by the census is reviewed regularly and Local Authorities have an opportunity to input into the review process. There is therefore the potential for local authorities to help frame future data collection in a way that would be useful to them. However, there is little point in influencing data collection in this way if the data collected is not used to inform policy and practice. This issue therefore has wide implications for working practice and training of staff.

Testing of the models highlighted that any one of several independent variables produce a potentially useable model for local authorities. This is arguably both an opportunity and a threat to the usability of a model predicting levels of homelessness decisions. The flexibility that this offers may be welcomed by

Local Authorities due to the potential for linking homelessness with specific political agendas that may be apparent within a council area. Having a variety of potential models allows for the possibility of obtaining both practical and financial support for homelessness on the back of other higher priority local issues. Allowing for the possibility of choice of one particular predictor over another could however encourage subjectivity in the prediction and planning of homelessness services when one of the objectives of this research was to reduce levels of subjectivity. Different predictors will inevitably produce more or less conservative predictions which could then be used for political purposes. There is also the real risk that an overly prudent estimation of the expected levels of homeless decisions could further limit, rather than expand, the resource availability within a homeless department and have the undesirable effect of further curtailing the help available to homeless people.

The survey of Local Authorities conducted in the early stages of this research highlighted that 83% of councils would be interested in considering the use of other planning methods. A further 14% indicated that they would be interested if those methods were supported by Central Government. Such support would therefore appear to be key to the success or failure of integration of such a method. In considering the likelihood of support by Central Government the financial implications of the model need to be addressed. Ultimately, encouragement to use prediction models is likely to lead to greater financial demands being placed on Central Government. Homelessness services would have to compete with all other areas of public life for the additional resources that such an approach is likely to require. Homelessness does not have the weighty backing that issues such as education, health and defence seem to command and it is questionable whether the call for resources would be heard above those arguably more heavyweight issues. Additionally, the current, predominantly subjective, systems give Central Government the opportunity to deny the reality of the situation. Whilst there is uncertainty regarding the size of the problem, there is less of an expectation and pressure for government to deal with the matter.

Even if Central Government did support the use of prediction models for homeless decisions, there is still the question of how useable the current models prove to be. As can be seen by the final results in the following chapter, the strength of the models vary between being able to explain 87% of the outcome variable to just 19%. Whilst all models are statistically significant (generally at $p<.001$), in all of the models there is a proportion of the outcome variable which is unexplained. Unless a Local Authority can predict the total number of homelessness decisions it will need to make within a particular time frame, the model will arguably be of limited use for strategic planning purposes. Obviously, the stronger the original model and the smaller the standard errors for the beta values, the less error there would be in 100% estimation. Even though such subjective forecasting is a non-rigorous approach, it may be quite appropriate and the only reasonable method in certain situations (Abraham and Ledolter, 1983).

6.4 Conclusion

Testing the various models highlighted in the previous chapter confirmed reliability by looking at how consistent the models proved to be across three different samples; the full sample of Local Authorities and two random samples of 50%. Testing also revealed a number of stable and strong models for each of the different council types. Whilst the amount of variance in the outcome variables explained by the models varied between different council groups, within the groups the models proved to be consistent and reliable, provided that the sample size used was adequate for regression purposes. This suggests that the predictor variables highlighted are useful in predicting levels of homeless decisions. There are however limitations to these models as well as opportunities to improve their reliability and strength. Ultimately, because of the complexity of homelessness, it is unlikely that there will ever be a model that could explain 100% of homeless decisions but the figures produced in this research appear to offer a strong starting point. The best fit models are detailed in the next chapter and conclusions and recommendations are drawn from the results.

Chapter 7: Conclusions and recommendations

7.0 Introduction

This chapter draws together the conclusions of the research and looks at how the findings may impact on the response to homelessness. It concludes that it does seem possible to predict levels of homelessness within a Local Authority area using statistics on other social issues that are described by literature and social theory as being intrinsically linked to the concept of homelessness. The chapter summarises the limitations of a prediction model for homelessness as well as the advantages that a model may bring. It highlights however that the dependent variable used to build the models is far from ideal. The chapter details that a number of variables could potentially be used with very similar outcomes but any model would only be useful if supported by Central Government. It concludes that a model could potentially be improved if useable statistics were available for deinstitutionalisation and mental health, these being key issues that often precede homelessness. A number of policy changes are recommended including a change in the statistical monitoring of homelessness – encouraging Local Authorities to adopt a wider interpretation of the term and producing more realistic figures to use as a basis for further statistical modelling. It concludes that further quantitative research that builds on the plethora of qualitative research could potentially be useful to local authorities in providing strong guidance to strategic planning of homeless services.

7.1 Conclusions of the research

Key aspects of the statistical findings of this research are detailed in a), b) & c) below and are considered in terms of how they might challenge orthodox thinking about homelessness. The chapter outlines in d), what variables proved most effective at predicting levels of homelessness decisions for different types of councils and provides two worked examples of how to apply the models to forecasting. Potential flags for further research or intervention are discussed in e) and in f) implications for policy and practice are highlighted. The difficulties associated with the dependent variable are addressed in g) and some of the political implications of implementation of the research are detailed in h). The need for improved data and regular review is detailed in i) & j). Finally, k) describes how this empirical evidence contributes to sociological theory.

a) This research demonstrates that it is possible to predict homelessness levels using data from subject areas that are linked with, or viewed as being common precursors to, homelessness. Whilst there has been plenty of qualitative evidence supporting these links for many years, there has been a distinct lack of quantitative evidence. This research provides new quantitative evidence for many of these associations and forms a basis on which to build a new approach to planning of homeless services. The research suggests that future data collection could be shaped to meet the findings of qualitative research in this area as well as the findings of this research.

b) This research suggests that it is possible to reliably predict likely levels of homelessness two or three years into the future. The research provides new quantitative evidence that there appears to be a time lag between the experience of social issues and the highest correlation with homelessness decisions. This could be utilised in planning of homeless services.

c) Data on the number of people separated in the area can be used to produce a model that explains a significant amount of the variance in the outcome variables of total homeless decisions and full duty decisions. Often more so than other variables for issues such as poverty, poor health, ethnicity, sex and age, deinstitutionalisation and drug abuse, highlighted by the literature as arguably more directly associated with homelessness. Whilst there is qualitative evidence to support this link, it is far less explicit than the literature supporting the other issues highlighted. This research provides new quantitative evidence to support this particular association, providing statistical support for the clear consensus amongst Local Authorities that relationship breakdown is one of the three main recorded reasons for homelessness. The traditional idea of using housing statistics as potential indicators appears to be misdirection as this research found very little correlation between levels of homelessness decisions and the housing indicators used. Society has tended to assume that homelessness is predominantly a housing issue (eg. Bramley, 1988; Barker, 2004; Edgar et al, 2002a; ODPM, 2005i; Shelter Scotland, 1993). As a consequence, policy response from Government has historically been framed around the provision of, and access to, housing (ODPM, 2003c, 2005a; DCLG, 2007). Whilst this has arguably been an understandable response, this research clearly challenges the orthodoxy by highlighting that issues such as relationship breakdown, limiting long term mental or physical illness and 'social disadvantage' have been shown to be more powerful than housing indicators for predicting levels of homelessness decisions. This research can therefore be viewed as critical social research (Harvey, 1990) as it helps homelessness to be seen in a different light to the traditional housing perspective and identifies new knowledge which can be used to help transform policy and practice.

The fact that data on several different issues can be used to produce models that are very similar in outcome could be considered a threat to the credibility of a prediction model for homelessness. However, the fact that there is effectively a choice of independent variables available for use in modelling homelessness could also be seen as a positive step towards flexibility and objectivity. For example, the variable indicating relationship breakdown is sourced from the census and consequently is currently only available every ten years. Whilst the correlation between this variable and the number of homeless decisions remained fairly consistent for a three or four year period after the date of the independent variable data, in the absence of mid-census estimates or figures being available, an alternative model using the poor health variable for example could be used for the later half of the decade. Further, if there is focus on a particular social policy area within a council area, planning of homelessness services can be more easily integrated into overall development plans if there is a level of versatility in the models available. This research provides new evidence to support a flexible quantitative approach to service planning and consequently goes some way to meeting the objectives set out in chapter 1.

d) The research points to there being a number of possible independent variables that could be used to help predict levels of homelessness. Including a combination of several indicators combined in the form of a "social disadvantage" factor. The social disadvantage factor scores are produced using the following variables: (i) separated but still legally married, (ii) mixed race, (iii) limiting long term illness, (iv) Income Based Job Seekers Allowance claims and (v) under 18 conceptions. The three best fitting models for the sample as a whole and the various council types are detailed in the tables below. The models are generally ranked in the order of the magnitude of R^2 however this is not always the case. If the standard error of the beta values was particularly small, a model was ranked more highly than another with a higher R^2. This was due to the improved reliability as a result of the smaller error margins. For example, in Table 7.1, for the models produced for London and metropolitan borough councils, the model using the social disadvantage factor score was ranked more highly than the model using the relationship variable despite the later having a higher value of R^2.

Best fitting models for total homeless decisions								
	Rank	**Variable**	**Beta value constant**	**SE beta**	**Beta value predictor**	**SE beta**	**R**	**R^2**
Overall model	1st	factor score	2.683	0.014	0.381	0.014	0.855	0.73
	2nd	Logsexage3	-0.058	0.102	1.144	0.042	0.847	0.72
	3rd	logrelationship1	-1.923	0.172	1.369	0.051	0.845	0.71
Borough Councils	1st	factor score	2.718	0.033	0.423	0.045	0.716	0.51
	2nd	logpoorhealth1	-4.013	0.794	1.556	0.189	0.668	0.45
	3rd	Logethnicity2	1.297	0.293	0.436	0.103	0.417	0.17
District Councils	1st	logrelationship1	-1.224	0.332	1.152	0.105	0.737	0.54
	2nd	logpoorhealth1	-1.732	0.472	0.992	0.113	0.658	0.43
	3rd	factor score	2.656	0.035	0.336	0.041	0.634	0.40
Unitary Councils	1st	factor score	2.543	0.051	0.516	0.054	0.848	0.72
	2nd	Logsexage3	-1.293	0.441	1.583	0.168	0.847	0.72
	3rd	logpoorhealth1	-5.408	0.923	1.852	0.207	0.834	0.70
City Councils	1st	factor score	2.681	0.046	0.354	0.034	0.942	0.89
	2nd	logrelationship1	-1.536	0.485	1.278	0.139	0.926	0.86
	3rd	logpoorhealth1	-2.894	0.693	1.297	0.155	0.913	0.83
Unitary & City Councils	1st	factor score	2.608	0.038	0.427	0.035	0.863	0.75
	2nd	Logsexage3	-0.704	0.282	1.366	0.107	0.872	0.76
	3rd	logpoorhealth1	-4.089	0.613	1.558	0.137	0.846	0.72
London Borough Councils	1st	factor score	2.813	0.084	0.349	0.062	0.784	0.61
	2nd	Logpoverty3	1.178	0.416	0.59	0.118	0.746	0.56
	3rd	logrelationship1	-2.036	0.905	1.432	0.245	0.794	0.63
Metropolitan Borough Councils	1st	factor score	2.704	0.114	0.341	0.075	0.69	0.48
	2nd	logrelationship1	-1.523	0.923	1.277	0.25	0.729	0.53
	3rd	Logsexage3	-0.021	0.73	1.225	0.253	0.676	0.46
London & Metropolitan Borough Councils	1st	factor score	2.776	0.114	0.329	0.075	0.69	0.48
	2nd	logrelationship1	-1.718	0.651	1.338	0.176	0.749	0.56
	3rd	Logpoverty3	1.326	0.446	0.529	0.124	0.535	0.29

all ps<0.001

Table 7.1 Best fitting models for total homeless decisions

Best fitting models for full duty homeless decisions								
	rank	Variable	Beta value constant	SE beta	Beta value predictor	SE beta	R	R²
Overall model	1st	factor score	2.373	0.012	0.366	0.012	0.874	0.76
	2nd	logsexage3	-0.227	0.094	1.085	0.039	0.855	0.73
	3rd	logrelationship1	-2.167	0.147	1.359	0.044	0.877	0.77
Borough Councils	1st	factor score	2.365	0.026	0.356	0.036	0.729	0.53
	2nd	logrelationship1	-1.689	0.428	1.21	0.133	0.703	0.49
	3rd	logpoorhealth1	-3.341	0.64	1.319	0.152	0.685	0.47
District Councils	1st	logrelationship1	-1.835	0.303	1.253	0.096	0.794	0.63
	2nd	factor score	2.377	0.033	0.349	0.038	0.675	0.46
	3rd	logpoorhealth1	-2.282	0.459	1.055	0.11	0.692	0.48
Unitary Councils	1st	factor score	2.271	0.039	0.493	0.042	0.894	0.80
	2nd	logrelationship1	-4.106	0.708	1.908	0.202	0.847	0.72
	3rd	logpoorhealth1	-5.296	0.73	1.762	0.164	0.877	0.77
City Councils	1st	factor score	2.363	0.053	0.347	0.039	0.923	0.85
	2nd	logrelationship1	-1.718	0.576	1.238	0.165	0.895	0.80
	3rd	logpoorhealth1	-3.066	0.787	1.263	0.175	0.887	0.79
Unitary & City Councils	1st	factor score	2.319	0.032	0.413	0.029	0.891	0.79
	2nd	logsexage3	-0.856	0.242	1.311	0.092	0.894	0.80
	3rd	logpoorhealth1	-4.113	0.535	1.497	0.12	0.869	0.75
London Borough Councils	1st	factor score	2.348	0.098	0.435	0.069	0.817	0.67
	2nd	logrelationship1	-3.626	1.026	1.766	0.278	0.818	0.67
	3rd	logpoorhealth1	-0.581	1.003	0.745	0.217	0.461	0.43
Metropolitan Borough Councils	1st	factor score	2.343	0.108	0.355	0.07	0.734	0.54
	2nd	logrelationship1	-1.901	0.871	1.288	0.236	0.759	0.58
	3rd	Logethnicity2	0.829	0.457	0.602	0.136	0.688	0.47
London & Metropolitan Borough Councils	1st	factor score	2.367	0.073	0.374	0.05	0.747	0.56
	2nd	logrelationship1	-2.542	0.662	1.467	0.179	0.777	0.60
	3rd	Logethnicity2	1.347	0.37	0.426	0.103	0.529	0.28

All ps<0.001

Table 7.2 Best fitting models for full duty homeless decisions

To demonstrate how these models can translate to useable tools for Local Authorities, two worked examples are shown below using the models highlighted in red in the tables above. These examples are based on the historical data used for this research.

Example 1: Using the best fit model for predicting the total number of homeless decisions for Unitary and City Councils (Simple regression using social disadvantage factor scores - highlighted in red in table 7.1 above).

The regression equation would be:

$Y = b_0 + (b_1$ multiplied by X)

where Y is the outcome variable which in this example is the log of the total number of homeless decisions for an Authority in 2003 (one of the two dependent variables chosen for building the model); b_0 is the beta value for the constant in the model and X is the social disadvantage factor score for the Authority (as calculated in the factor analysis detailed in **5.3.2** earlier and listed in Appendix 4). So, using Plymouth City Council as an example, the regression equation becomes:

Log of the total number of Homeless decisions made by Plymouth City Council in 2003 = 2.608 + (0.427 x 1.313452)
(see table 7.1 above)

therefore;

Log of the total number of Homeless decisions made by Plymouth City Council in 2003 = 3.168844

therefore;

The total number of Homeless decisions made by Plymouth City Council in 2003 = 1475

The model predicts a figure of 1475 total homeless decisions made and Plymouth City Council actually recorded a total of 1523 decisions in 2003. When the model is re-run considering the standard error of the beta values and taking the minimum and maximum values for each (2.608± half the standard error of the beta values for the constant and 0.427± half the standard error of the beta value for the predictor variable) the parameters of the model predict a figure between a minimum of 1339 and a maximum of 1626, the mid point of which is 1482 which is exceptionally close to the actual figure. However, it must be borne in mind that the model for predictor scores only explains 75% of the variance in the total number of homeless decisions. This might suggest that Plymouth City Council records less homeless decisions than would be expected using this model.

Example 2: Using the second best fit model for predicting the total number of homeless decisions resulting in the full homelessness duty for councils in general (Simple regression using the log of variable sexage3 – highlighted in red in table 7.2 above).

Again, the regression equation would be:

$Y = b_0 + (b_1$ multiplied by $X)$

where Y is the outcome variable which in this example is the log of the total number of homeless decisions resulting in the full homeless duty being accepted for an Authority in 2003 (the other dependent variable chosen for building the model); b_0 is the beta value for the constant and X is the log of the variable sexage3 for the authority. Variable sexage3 is the number of under 18 conceptions between 1998 and 2000 for the Authority. So, again using Plymouth City Council as an example, the regression equation becomes:

Log of the total number of homeless decisions resulting in the full homeless duty being accepted by Plymouth City Council in 2003 = **-0.227 + [1.085 x (log of 696)]**

therefore; = **-0.227 + [1.085 x 2.842609]**

Log of the total number of homeless decisions resulting in the full homeless duty being accepted by Plymouth City Council in 2003 = **2.857231**

therefore;

The total number of homeless decisions resulting in the full duty being accepted by Plymouth City Council in 2003 **= 720**

The model predicts a figure of 720 total homeless decisions resulting in the full duty being accepted being made by Plymouth City Council in 2003. The actual figure recorded was 982. When the model is re-run considering the standard error of the beta values taking the minimum and maximum values for each (-0.227 ± half the standard error of the beta values for the constant and 1.085 ± half the standard error of the beta value for the predictor variable) the mean of the parameters for the model is 730. Whilst this model may not appear to be quite as accurate as the first estimate, the model uses much more accessible figures in the equation and is therefore arguably more useful to Local Authorities. However, as before, the variable used in this model does not explain all of the variance in full duty decisions. It only explains 73% of the variance in the number of full duty decisions.

e) Several of the variables originally identified as possible predictor variables showed significant correlation with the outcome variables but were not ultimately included in a prediction model for homelessness. This was essentially due to the fact that there were other variables that demonstrated stronger associations. However significant relationships were nonetheless highlighted by the statistical analysis and these findings should not be ignored. There are three main areas that warrant further acknowledgement that have not been put forward as prediction models:

Firstly, the number of people with no religion showed strong correlation with the number of homeless decisions across the various time points for the dependent variables. Whilst this is possibly due to extraneous factors, in the extreme, it could be interpreted as suggesting that encouraging religion could have an impact on the levels of homelessness within an area. However, a broader and more general interpretation of the issue picking up on some of the values and benefits that religion brings would seem to be more credible. Encouraging a sense of community and belonging, compassion for one's fellow man and a desire to help those less fortunate could all arguably contribute to reducing the levels of homelessness within a Local Authority area. If local councils were able to be more proactive in such community development it could potentially have a significant impact on the demand for their homelessness services.

Secondly, the issue of leaving social services care was also highly correlated with the number of homeless decisions in a Local Authority area. This was not just in relation to young people leaving care but included children leaving social services care. The high incidence of a care history amongst the homeless population as detailed in the literature is supported by these research findings. The additional quantitative support for this association provided by this research should be an indicator to Local Authorities that care services are failing to provide their wards with adequate safeguards against homelessness. Remedial action in this area could potentially reduce levels of homelessness and it would therefore be in the interests of the homelessness departments to work together with social services departments to achieve this.

Thirdly, the migration variable "lived elsewhere within the associated area" also showed strong correlation with the dependent variable. This suggests that a decrease in the housing mobility amongst the local population might correlate with a decrease in the number of homeless decisions. Encouraging less mobility in the local housing market is a complex and challenging task that would involve consideration of many issues including employment and educational opportunities in an area, inflation levels, business and residential development, local supply and demand issues, tenancy law and interest rates among other things. Mobility within the local housing market is therefore unlikely to be altered significantly by minor changes in local forces. Local Authorities should however still maintain an awareness of their part in the picture and take action to mitigate the effects of national forces by ensuring that their housing systems do not exacerbate the situation. For example, local planning regulations and rent restrictions for housing benefit purposes can have a significant effect on the local supply and demand for different types of housing within an area. Long delays in the processing of housing benefit claims can also cause accommodation to be lost and result in unnecessary movement within the housing market. The findings of this research suggest that if Local Authorities have the opportunity and ability to reduce levels of mobility within their local area they may also be able to reduce levels of homeless.

f) This research could contribute to changing the way Local Authorities plan for the future of their homelessness services. The findings could have a significant impact on the service provision to homeless people and ultimately, to the experience of people who have found themselves in a situation of homelessness. Specifically, some degree of objectivity could be injected into what is essentially currently a highly subjective process of guess work. If Local Authorities could be encouraged to use the same method of gauging future need, the increased standardisation and objectivity would go some way to removing any political bias that may exist within a particular council. Further, the use of a valid, reliable method of standardisation could facilitate comparison between Local Authorities and start to remove what is effectively somewhat of a lottery system which rewards those authorities who are better equipped or better experienced at stating their case for funding. Historically, services have been funded year on year, although this may be changing. In December 2007 the Department for Communities and Local Government awarded a three year settlement to Local Authorities for the first time (Department for Communities and Local Government, 2007d). Improving the ability to plan for the longer term may provide increased stability and certainty for homeless services and free up resources that could be used instead to improve the service provided to homeless people. However, perhaps more importantly, by including associated issues in the strategic planning of homeless services, it would help place homelessness within a wider social agenda and bring different, perhaps previously unassociated, departments into partnership with each other. This research provides new evidence to support such practices and consequently fulfils the objectives set out in the first chapter.

g) The dependent variable used in this research for exploratory modelling purposes is inadequate and a more inclusive statistic might produce more realistic or useful results. The use of the P1E returns in the statistical modelling reflects what is effectively a restrictive practice of Local Authorities. These figures under-represent the number of homeless persons needing help in a particular area and will therefore provide a model that will also underestimate the potential need. The use of this dependent variable will inevitably have had a huge impact on which indicators demonstrated the strongest links with homelessness decisions. The Local Authority figures for full duty homeless decisions will of course correspond to the priority need groups detailed by the legislation and it is therefore no surprise, for example, that the number of under18 conceptions in the area produces a strong prediction model, with under 18's and pregnant women both being priority need groups. Nonetheless, this does not explain why there is a high incidence of these groups needing to call on the Local Authority for help with housing. The strength of the model using the number of separations in the area as the key predictor does however provide a reasonable explanation for this need for assistance and relationship breakdown in itself is not automatically considered as a priority need category. This suggests that the models produced by this research are not driven or essentially framed by the statutory limitations of the P1E returns.

h) Central Government support for such a model is unlikely due to cost implications and the shift this would generate towards more objective, and therefore less deniable, funding requirements. A valid, quantitative model showing the true picture of potential levels of homelessness within a Local Authority area is likely to highlight significant gaps in resource and service provision which will require a response from Central Government. Such a model would leave little room for the Government to sidestep the responsibility. Responding effectively to homelessness is a political quandary, costly and generally not a vote winner. The Rough Sleepers Initiative cost millions of pounds and arguably did not achieve its objective. The press were quick to highlight that the money spent could have been used instead to fund the building of thousands of new homes. However Central Government respond to homelessness there appears to be a general perception that policy is either too hard or too soft and the issues nonetheless remain unresolved. Navigating through such a political quagmire is a challenge in itself but there is evidence to suggest that there is nonetheless a willingness to use social science to improve policy and practice if the approach is timely and appropriate (Shinn, 2007). The problem of take-up is therefore arguably not insurmountable.

i) The models could potentially be improved by using better indicators for some of the possible precursors to homelessness eg mental health difficulties, deinstitutionalisation and poverty. The literature shows such issues can lead to homelessness but there appears to be inadequate statistics available at Local Authority level to form the basis of quantitative support for these links with levels of recorded homelessness. Until better statistics are available at Local Authority level, it will be very difficult to look at further refining the prediction models for homeless produced by this research.

j) Due to the changing nature and complexity of homelessness, a dynamic approach to prediction of need is required and any model needs reviewing regularly. The causes and features of homelessness change with time and any statistical model used to predict homelessness will therefore require re-evaluation over time; considering new potential predictor values as well as new measures of the dependent variable. Whilst there appears to be strong evidence that a predictive model could be found for homelessness, it must therefore come with a cautionary note that the predictors and the model itself should be regularly reviewed as the correlates of homelessness change over time (Shinn, Baumohl and Hopper, 2001). Not only does the phenomena itself change but the causes and roots of homelessness will also vary as global, societal and personal challenges impact on individual lives. For example, in twenty years' time, with global warming taking hold, the likelihood of flooding in an area may be a predominant issue to include in any model. Any predictive model for homelessness is at risk of becoming outdated and progressively inefficient, depending on how quickly the nature of homelessness itself changes.

k) The models produced in this research add support to the idea of social disadvantage being at the heart of homelessness and homelessness being at the heart of social exclusion. The themes identified as being robust predictors of homelessness are well supported in the theoretical literature and together, paint a picture of a complex social issue with no easy or straightforward solutions. Some of the individual indicators that make up the social disadvantage factor, such as receipt of a means tested benefit and number of under 18 conceptions, may have links with Murray's view of the developing underclass in Britain (Murray, 1999). However, at the same time, this combination of indicators relating to homelessness could also be seen in terms of loss or lack or something and disconnection from society: Loss of a relationship, lack of clear identity, lack of health, loss of childhood freedoms and potential as a result of pregnancy, loss of financial independence. If considered from such a perspective, the models using the social disadvantage factor sit much more at ease with more liberal views of social integration (Durkheim, 1947 Blackman, 1997; Walker, 1990) that posit how systems and attitudes within society can compound and exacerbate the suffering of individuals who have become excluded from society.

7.2 Recommendations of the research

7.2.1 For researchers

* More and ongoing quantitative research is needed in this area. One key area to explore would be that of using a different dependent variable. Instead of the model being constructed using the very limited P1E figures, it might be more appropriate to base the modelling on housing register figures. These would arguably provide a more comprehensive picture of local housing need, and would help to frame homelessness and the risk of homelessness in its widest sense. Further exploration of other potential predictor indicators could not only improve the model suggested but could also encourage the debate around how and where homelessness sits in a developed society.

7.2.2 For Government

* Recognise the potential to simplify and standardise the process of effective funding of homeless services by the use of statistical models. This can be achieved by providing resources for further research in this area as well as training and encouragement to Local Authorities in such methods.

* Improve availability and recording of statistics on associated issues. Improving data availability for associated issues such as deinstitutionalisation, relationship breakdown and mental health difficulties might lead to improvement of the model. This is particularly relevant in relation to people leaving prison and people experiencing health difficulties. The literature points to a significant

proportion of homeless people as having served custodial sentences and / or having debilitating health issues but Local Authorities still appear to be ineffective at gauging and responding to these phenomena. Discharge figures are produced for each prison and hospital and do not therefore immediately relate to Local Authority areas. It is not reasonable to expect individuals approaching a Local Authority for assistance with their housing to have no concerns about open disclosure of a custodial sentence or a mental health problem. These are generally perceived as negative issues that will potentially hinder rather than facilitate a request for help. The fall out of institutionalisation can therefore often and easily be overlooked. A more strategic recognition of these issues could potentially abate this problem. If the expectation is that that there will be X offenders being discharged from prison or patients being discharged from hospital within a given period and therefore Y homeless people potentially approaching the Local Authority for assistance under the homeless legislation, appropriate resources can be put in place to respond more effectively to the presenting need.

This recommendation can easily be actioned by simply requiring hospital and prison data to include a Local Authority reference and collating the data at appropriate administrative levels. This improvement in recording discharge could equally be applied to the armed forces. Indeed by requiring all statutory bodies to include data on administrative hierarchy within their statistics there would be much greater potential for secondary data analysis at different levels of the administration. This would not only potentially be useful for homelessness services but could also facilitate quantitative modelling for other social issues. Such an approach could encourage much more cross-departmental collaboration and highlight links and correlations that might otherwise not have been observed or harnessed. Housing indicators did not appear to be the best quantitative indicators of homelessness in this research. The more helpful indicators came from other areas of society and were only discovered by casting a wider social net. It is possible that the generation of more comparable statistics (in terms of administrative boundaries covered by the data) may enable similar patterns for other areas of social concern to be highlighted.

* Change the way that statistics are collected regarding homelessness. Currently, the required P1E returns dictate what information is collected from whom and the majority of authorities focus their recording efforts on satisfying these statutory requirements. Some Local Authorities go further and monitor all approaches to the homelessness section. The 2002 legislation encouraged Local Authorities to widen their views of homelessness and consultation regarding the possibility of a national homeless strategy demonstrated an acknowledgment amongst Local Authorities that a wider approach would be necessary if homelessness was to be responded to effectively. There is support for the collation of figures recording 'homelessness presentations' (Pawson et al, 2007) but without a standardised requirement, recording will not be consistent or comparable across Local Authorities. Mandatory recording of all approaches to the homelessness section would provide a more detailed picture of the issues around homelessness within a particular area and arguably provide a more realistic data base from which to base strategic planning decisions.

* Require Local Authorities to review their homeless strategies every three years as opposed to every five years. This would generate a stable but more responsive service for homeless people. All Local Authorities are currently required by law to review their homelessness strategies at least every five years. The first mandatory review of the strategies had to be in place by July 2008. Many authorities consider a five year period to be too long and have taken the decision to review their strategies every three years. Given that correlation between the associated issues and homelessness decisions seems to peak two to three years after the date of the data on the associated issue, it would appear that a three year period of review may be more appropriate.

* If the assumption is made that the various factors highlighted by the literature and this research are the causes of homelessness which therefore must be removed, public policy must surely then aim to eliminate or reduce mental health problems, alcohol and drug abuse, poor health, poverty and family disputes as well as all the other factors previously highlighted. One view is that without such far reaching policy changes, society will always be having to respond to homelessness. Homelessness and rough sleeping will therefore only be reduced by long term programmes affecting millions of people (Randall and Brown, 1999).

7.2.3 For Local Authorities

* Change the nature of the systems for dealing with homelessness or at least have an awareness of the potential bias and impact of the systems on the lives of homeless people. In an attempt to appear to be objective, there is a perceived loss of humanity and compassion within the Local Authority system

and a perceived lack of responsiveness to suffering. A change in attitude to one that embodies the belief that the law and council staff are actually trying to help rather than exclude could have a positive impact on people. Such an action may not need lots of extra resources – just a more positive approach from within the system to bring about change might even provide people with the hope and encouragement they need to resolve their own difficulties.

* Acknowledge the wider policy implications for the associated subject areas and improve partnership working to address these issues together. If the system can work to reduce separations and under 18 conceptions for example, there may be less homelessness as a result and less demand on homelessness services. This certainly sounds reasonable on a common sense level and it is possible that such an approach would lead to more partnership / cross-social boundary working to improve the quality of life within society as a whole. This must however be regarded with caution. As discussed in the previous chapters, there appear to be a number of issues that correlate strongly with the outcome variables as well as with each other. The models provide some explanation for homeless decisions but not the only explanations. There would appear to be many explanations that are equally valid. Consequently, reducing numbers within the possible predictor variables will not necessarily have any impact on the levels of homelessness decisions. There is nonetheless still the possibility that there may be an impact.

7.3 Conclusion

This research provides a number of statistical models for predicting levels of homelessness within a Local Authority. These models use data on issues that have not traditionally been used to determine levels of extreme housing need but which have nonetheless shown a statistically reliable and valid association with homelessness. Until now, the limited quantitative research that has been undertaken in this area has focused primarily on housing indicators such as house prices, rental values, interest rates and repossession figures. This research challenges the perception that such indicators are best placed to predict levels of homelessness. The research introduces the idea that indicators such as the number of relationships breaking down, the number of people with limiting, long-term illness and the number of under 18 conceptions within a particular area are better placed to predict future demands on homeless services.

Although the models developed may benefit from further refining, as they stand they suggest the possibility of an alternative, objective approach to the strategic planning of homeless services and could prove to be the next step towards standardisation and objectivity in effective resource allocation for homelessness in England. However, persuading Local Authorities and Central Government to adopt such a fundamental change in practice, or even accept the possibility of a complimentary method that could be used alongside existing practice, will be no easy task. Judging by the response of Local Authorities to the questionnaire sent out in the first stage of this research, statistical models are likely to be perceived as a radical and untested departure from what is essentially a tried and tested method of educated guess work, based predominantly on past experience and local consultation. The pervasive lack of expertise, experience and confidence in using statistical methods amongst council homelessness staff is likely to lead to a reluctance to incorporate them in to every day practice. The process itself of including such a new practice into existing routines requires resources at both a national and local level and resources are already thin on the ground in the field of homelessness. When a very brief summary of this research was sent to 162 Local Authorities asking about potential interest in the statistical models, only one response was received. Whilst this response was a positive one, the overall lack of engagement with the idea is an indicator of the potential challenges of change and integration generated by new ideas. Incorporating such a change in practice requires a commitment to the change from those working within the system, again at both a national and local level and some councils openly acknowledge that there appears to be little political will within their organisation to recognise the problems and address the issues (Tunbridge Wells Strategy, 2003). The current defensive or passive position of both Central and Local Government leaves little opportunity for giving such a commitment.

This attitudinal issue goes deeper than the attitude of the gatekeepers and the service providers. There appears to be a deep rooted cynicism within society left over from the huge cultural changes that occurred under the Conservative government of the 80's, discouraging any reliance on state provision. The gradual erosion of state provision has meant that people no longer feel that they can rely on it. There is the perception, in part due to right wing propaganda perpetrated by the popular press, that the little assistance that is still available is given to the undeserving or to non-UK nationals, furthering the view that the average person just doesn't matter or qualify for help. This is a challenge recognised by Nuneaton and Bedworth Council (among others) who have identified the need to redefine homelessness and change public perception of the issue (Nuneaton Strategy, 2003). There is undoubtedly huge pressure on limited resources and Local Authorities have the challenging task of trying to make the scarce resources stretch. Nonetheless, there appears to be a general lack of faith within society that the government can or will help put things right and an increasing feeling that self reliance is the only solution. Until this feeling shifts and a feeling of hope and self belief can percolate through society to those at the lower end of the social hierarchy, it will be difficult to convince homeless people that the Local Authority can help to improve their lives and bring an end to homelessness.

According to Edgar, Doherty and Meert (2002) it is the operation of the market that will continually create and recreate the conditions of vulnerability and continuous action is required by the state to protect the most vulnerable and to provide mechanisms of redistribution which operate to ensure social stability and promote social cohesion. While the UK government suggests that street homelessness has been reduced by two thirds since 1998, the number of homeless acceptances by Local Authorities continued to increase in the first half of this decade along with the number of families in temporary accommodation. This analysis suggests that it is structural factors which create the conditions that lead to vulnerability to homelessness and then agency factors interacting to determine the scale and nature of homelessness in different societies. Arguably then, within a market economy, homelessness will continue to exist in some form and a dynamic response to the phenomena will be necessary to have any impact on the scale or nature of the problem.

This research has provided new evidence to support possible improvements to the planning and management of homeless services. It is acknowledged that there are many obstacles preventing the widespread dissemination and integration of these findings into the everyday practice of Local Authorities. However, this research has nevertheless provided a new opportunity to improve the methods used in the prediction of levels of homelessness within a Local Authority area. With further work and appropriate support from Central and Local Government, the results of this research could initiate a change in how Local Authorities respond to homelessness and potentially improve the lives of homeless people.

Figure 1 - Level of response by Council type

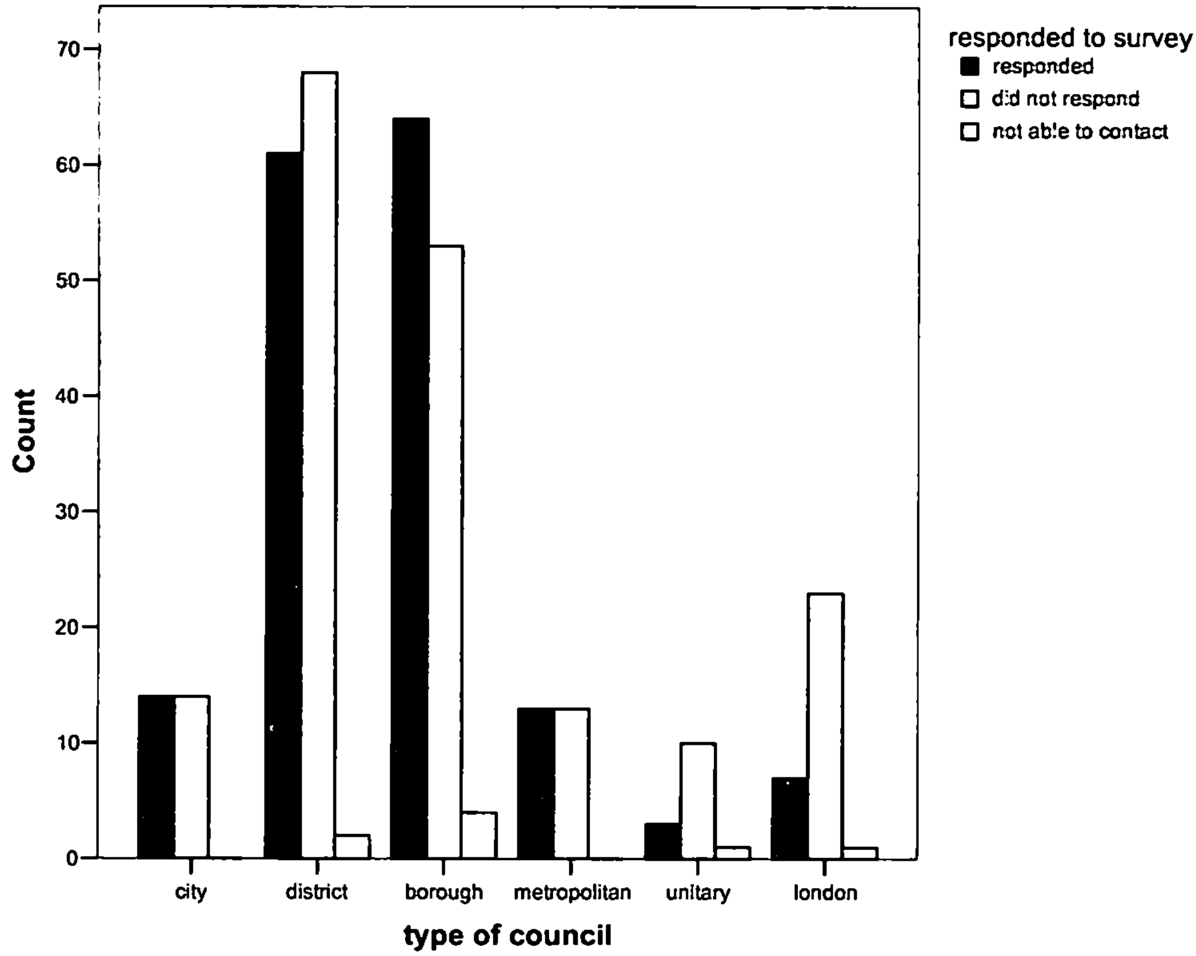


Figure 2 - Awareness / frequency of use of methods employed

P1E returns or experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use regularly	158	94.0	94.0	94.0
	Use occasionally	10	6.0	6.0	100.0
	Total	168	100.0	100.0	

Census or population data

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use regularly	45	26.8	26.9	26.9
	Use occasionally	95	56.5	56.9	83.8
	Heard of but don't use	27	16.1	16.2	100.0
	Total	167	99.4	100.0	
Missing	Did not respond	1	.6		
Total		168	100.0		

Street Counts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	use regularly	25	14.9	15.2	15.2
	use occasionally	69	41.1	41.8	57.0
	heard of but don't use	66	39.3	40.0	97.0
	not heard of or used	5	3.0	3.0	100.0
	Total	165	98.2	100.0	
Missing	did not respond	3	1.8		
Total		168	100.0		

Capture recapture methods

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	use regularly	8	4.8	5.1	5.1
	use occasionally	22	13.1	14.1	19.2
	heard of but don't use	27	16.1	17.3	36.5
	not heard of or used	99	58.9	63.5	100.0
	Total	156	92.9	100.0	
Missing	did not respond	12	7.1		
Total		168	100.0		

Consultation with local agencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	use regularly	125	74.4	74.9	74.9
	use occasionally	39	23.2	23.4	98.2
	heard of but don't use	3	1.8	1.8	100.0
	Total	167	99.4	100.0	
Missing	did not respond	1	.6		
Total		168	100.0		

Figure 2 - Awareness / frequency of use of methods employed (contd.)

Predictive statistical models

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	use regularly	10	6.0	6.2	6.2
	use occasionally	22	13.1	13.6	19.8
	heard of but don't use	93	55.4	57.4	77.2
	not heard of or used	37	22.0	22.8	100.0
	Total	162	96.4	100.0	
Missing	did not respond	6	3.6		
Total		168	100.0		

Figure 3 - Use of methods crosstabulated with their perceived adequacy

Method	Use	Perfectly adequate	Reasonably adequate	Inadequate	Very inadequate	Totals
P1E returns / experience	Use regularly	33	96	6	0	135
	Use occasionally	1	8	0	0	9
Census or population data	Use regularly	4	30	2	1	37
	Use occasionally	3	50	22	5	80
	Heard of but don't use	1	3	7	6	17
Street counts	Use regularly	3	13	4	2	22
	Use occasionally	6	25	19	7	57
	Heard of but don't use	2	13	17	7	57
	Not heard of or used	0	1	1	0	2
Capture recapture	Use regularly	2	3	2	0	7
	Use occasionally	1	14	2	0	17
	Heard of but don't use	0	3	5	1	9
	Not heard of or used	0	1	0	1	2
Consultation with local agencies	Use regularly	25	74	5	0	104
	Use occasionally	2	23	5	0	30
	Heard of but don't use	0	0	2	0	2
Predictive Statistical Models	Use regularly	3	6	0	0	9
	Use occasionally	1	13	3	0	17
	Heard of but don't use	3	14	9	2	28
	Not heard of or used	0	1	1	2	4

Figure 4 - univariate analysis - distribution statistics for all outcome variables at Local Authority level

Statistics

		2000 2nd quarter T2d	2000 4th quarter T4d	2000 1st quarter T1fd	2000 2nd quarter T2fd	2000 4th quarter T4fd	2001 1st quarter T5d	2001 2nd quarter T6d
N	Valid	325	329	326	325	329	326	318
	Missing	28	24	27	28	24	27	35
Mean		166.06	166.86	88.03	76.57	76.48	185.61	172.47
Std. Error of Mean		13.807	13.975	7.239	6.445	6.235	15.416	14.442
Median		85.00	84.00	47.00	45.00	42.00	96.50	91.00
Mode		41	27[a]	37	39	32	63[a]	23[a]
Std. Deviation		248.912	253.480	130.701	116.184	113.098	278.342	257.538
Variance		61956.965	64251.954	17082.682	13498.647	12791.104	77474.527	66325.903
Skewness		5.247	5.297	5.532	5.969	5.742	5.596	5.632
Std. Error of Skewness		.135	.134	.135	.135	.134	.135	.137
Kurtosis		40.560	41.506	48.583	55.484	53.600	47.852	49.118
Std. Error of Kurtosis		.270	.268	.269	.270	.268	.269	.273
Range		2697	2777	1528	1400	1362	3198	2974
Minimum		2	1	0	1	1	2	2
Maximum		2699	2778	1528	1401	1363	3200	2976

Figure 4 - univariate analysis - distribution statistics for all outcome variables at Local Authority level

Statistics

		2001 3rd quarter T7d	2001 4th quarter T8d	homeless decisions taken 2001/2	2001 1st quarter T5fd	2001 2nd quarter T6fd	2001 3rd quarter T7fd
N	Valid	326	332	291	327	317	326
	Missing	27	21	62	26	36	27
Mean		195.51	172.60	721.11	88.08	81.28	89.79
Std. Error of Mean		15.975	14.034	63.914	7.215	6.796	7.495
Median		101.00	87.50	376.00	47.00	46.00	49.00
Mode		50	28[a]	111[a]	37	15[a]	25[a]
Std. Deviation		288.444	255.719	1090.299	130.462	120.993	135.320
Variance		83199.857	65392.349	1188752.027	17020.402	14639.342	18311.468
Skewness		5.044	5.181	5.621	5.544	6.466	5.595
Std. Error of Skewness		.135	.134	.143	.135	.137	.135
Kurtosis		40.067	43.111	47.890	48.791	66.458	48.447
Std. Error of Kurtosis		.269	.267	.285	.269	.273	.269
Range		3191	2908	12269	1528	1528	1573
Minimum		1	2	9	0	0	0
Maximum		3192	2910	12278	1528	1528	1573

Figure 4 - univariate analysis - distribution statistics for all outcome variables at Local Authority level

Statistics

		2001 4th quarter T8fd	full duty accepted 2001/2	2002 1st quarter T9d	2002 2nd quarter T10d	2002 3rd quarter T11d	2002 4th quarter T12d
N	Valid	332	290	328	328	319	330
	Missing	21	63	25	25	34	23
Mean		79.94	338.21	180.81	185.77	196.82	186.10
Std. Error of Mean		6.623	29.909	15.005	15.347	17.392	15.428
Median		41.50	181.50	93.00	91.50	104.00	99.00
Mode		29	102[a]	57[a]	37	78	77
Std. Deviation		120.680	509.336	271.760	277.940	310.627	280.260
Variance		14563.673	259423.290	73853.740	77250.865	96489.113	78545.726
Skewness		5.167	5.863	5.465	5.258	5.657	5.273
Std. Error of Skewness		.134	.143	.135	.135	.137	.134
Kurtosis		40.243	53.466	46.131	42.233	45.261	39.322
Std. Error of Kurtosis		.267	.285	.268	.268	.272	.268
Range		1320	5944	3098	3078	3411	2970
Minimum		0	5	2	4	0	2
Maximum		1320	5949	3100	3082	3411	2972

Figure 4 - univariate analysis - distribution statistics for all outcome variables at Local Authority level

Statistics

		homeless decisions taken 2002/3	2002 1st quarter T9fd	2002 2nd quarter T10fd	2002 3rd quarter T11fd	2002 4th quarter T12fd	full duty accepted 2002/3
N	Valid	287	328	328	319	330	284
	Missing	66	25	25	34	23	69
Mean		743.68	82.09	86.09	91.56	84.82	336.25
Std. Error of Mean		69.572	7.060	7.290	8.297	7.000	32.295
Median		366.00	44.00	46.00	49.00	49.50	177.00
Mode		100[a]	31	35[a]	25	25	143
Std. Deviation		1178.630	127.862	132.024	148.192	127.158	544.248
Variance		1389169.364	16348.618	17430.340	21961.008	16169.213	296206.388
Skewness		5.459	6.272	6.184	6.215	5.774	6.319
Std. Error of Skewness		.144	.135	.135	.137	.134	.145
Kurtosis		42.458	58.824	58.772	52.975	45.272	54.930
Std. Error of Kurtosis		.287	.268	.268	.272	.268	.288
Range		12555	1548	1604	1653	1281	6084
Minimum		10	0	1	0	1	4
Maximum		12565	1548	1605	1653	1282	6088

Figure 4 - univariate analysis - distribution statistics for all outcome variables at Local Authority level

Statistics

		2003 1st quarter T13d	2003 2nd quarter T14d	2003 3rd quarter T15d	2003 4th quarter T16d	homeless decisions taken 2003/4	2003 1st quarter T13fd
N	Valid	331	312	341	342	290	331
	Missing	22	41	12	11	63	22
Mean		201.72	194.02	221.78	201.92	790.14	93.72
Std. Error of Mean		15.913	15.953	18.521	15.718	68.239	7.600
Median		109.00	108.00	122.00	106.00	450.00	55.00
Mode		34[a]	38[a]	41	70	346	37
Std. Deviation		289.521	281.777	342.018	290.668	1162.064	138.262
Variance		83822.135	79398.498	116976.337	84488.099	1350391.737	19116.398
Skewness		5.055	5.658	5.147	4.757	5.709	6.142
Std. Error of Skewness		.134	.138	.132	.132	.143	.134
Kurtosis		37.110	46.680	36.790	33.429	46.979	53.325
Std. Error of Kurtosis		.267	.275	.263	.263	.285	.267
Range		3034	3099	3558	3023	12714	1556
Minimum		1	0	0	1	2	0
Maximum		3035	3099	3558	3024	12716	1556

Figure 4 - univariate analysis - distribution statistics for all outcome variables at Local Authority level

Statistics

		2003 2nd quarter T14fd	2003 3rd quarter T15fd	2003 4th quarter T16fd	full duty accepted 2003/4	2004 1st quarter T17d	2004 2nd quarter T18d
N	Valid	312	341	342	289	336	337
	Missing	41	12	11	64	17	16
Mean		95.64	99.77	88.90	369.64	213.80	197.39
Std. Error of Mean		8.025	8.169	6.664	32.653	16.081	15.510
Median		56.00	56.00	52.00	215.00	104.00	100.00
Mode		40	23[a]	20	129	59	35[a]
Std. Deviation		141.755	150.850	123.234	555.101	294.762	284.730
Variance		20094.474	22755.605	15186.524	308136.745	86884.490	81071.381
Skewness		6.029	5.841	4.865	6.204	3.934	4.766
Std. Error of Skewness		.138	.132	.132	.143	.133	.133
Kurtosis		50.810	47.918	34.241	52.228	21.881	34.680
Std. Error of Kurtosis		.275	.263	.263	.286	.265	.265
Range		1520	1597	1222	5895	2662	3006
Minimum		0	0	0	0	2	2
Maximum		1520	1597	1222	5895	2664	3008

Figure 4 - univariate analysis - distribution statistics for all outcome variables at Local Authority level

Statistics

		2004 3rd quarter T19d	2004 4th quarter T20d	homeless decisions taken 2004/5	2004 1st quarter T17fd	2004 2nd quarter T18fd	2004 3rd quarter T19fd
N	Valid	352	353	326	337	337	352
	Missing	1	0	27	16	16	1
Mean		201.82	180.53	794.40	96.26	91.28	91.53
Std. Error of Mean		15.082	13.629	62.192	6.935	6.667	6.504
Median		105.00	93.00	393.50	54.00	52.00	53.50
Mode		57[a]	20[a]	177[a]	36	23	30
Std. Deviation		282.959	256.058	1122.899	127.307	122.393	122.025
Variance		80065.572	65565.545	1260901.306	16207.109	14979.996	14890.084
Skewness		4.598	4.548	4.471	4.573	4.650	5.521
Std. Error of Skewness		.130	.130	.135	.133	.133	.130
Kurtosis		31.978	30.698	29.430	31.210	34.202	49.159
Std. Error of Kurtosis		.259	.259	.269	.265	.265	.259
Range		2920	2571	11154	1228	1308	1458
Minimum		1	1	11	0	0	0
Maximum		2921	2572	11165	1228	1308	1458

Figure 4 - univariate analysis - distribution statistics for all outcome variables at Local Authority level

Statistics

		2004 4th quarter T20fd	full duty accepted 2004/5
N	Valid	353	326
	Missing	0	27
Mean		82.16	357.16
Std. Error of Mean		5.874	26.475
Median		46.00	208.50
Mode[a]		21	78
Std. Deviation		110.354	478.016
Variance		12178.090	228498.908
Skewness		4.796	5.021
Std. Error of Skewness		.130	.135
Kurtosis		37.978	39.248
Std. Error of Kurtosis		.259	.269
Range		1242	5236
Minimum		0	0
Maximum		1242	5236

a. Multiple modes exist. The smallest value is shown

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2000 2nd quarter T2d	2000 4th quarter T4d	2000 1st quarter T1fd	2000 2nd quarter T2fd	2000 4th quarter T4fd	2001 1st quarter T5d
N	Valid	123	127	127	122	128	127
	Missing	26	22	22	27	21	22
Mean		392.81	381.69	204.22	183.89	176.59	429.07
Median		302.00	297.00	155.00	151.50	134.00	315.00
Mode		406	132	48[a]	36[a]	53[a]	95[a]
Std. Deviation		364.924	354.988	187.615	174.308	159.733	396.921
Variance		133169.366	126016.453	35199.253	30383.220	25514.701	157546.003
Skewness		3.097	3.389	3.294	3.401	3.649	3.472
Std. Error of Skewness		.218	.215	.215	.219	.214	.215
Kurtosis		14.310	17.657	19.226	19.475	23.532	19.327
Std. Error of Kurtosis		.433	.427	.427	.435	.425	.427
Range		2696	2774	1528	1399	1361	3196
Minimum		3	4	0	2	2	4
Maximum		2699	2778	1528	1401	1363	3200

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2001 2nd quarter T6d	2001 3rd quarter T7d	2001 4th quarter T8d	homeless decisons taken 2001/2	2001 1st quarter T5fd	2001 2nd quarter T6fd
N	Valid	119	125	132	104	127	119
	Missing	30	24	17	45	22	30
Mean		392.33	469.57	401.82	1662.76	205.61	183.35
Median		324.00	394.00	323.50	1294.50	155.00	153.00
Mode		177	89[a]	426	886[a]	48[a]	109
Std. Deviation		360.328	399.876	350.331	1543.499	186.741	172.698
Variance		129836.239	159900.683	122731.692	2382387.990	34872.175	29824.451
Skewness		3.832	3.183	3.365	3.838	3.328	4.363
Std. Error of Skewness		.222	.217	.211	.237	.215	.222
Kurtosis		23.005	17.263	19.807	22.111	19.531	30.779
Std. Error of Kurtosis		.440	.430	.419	.469	.427	.440
Range		2974	3191	2908	12269	1524	1527
Minimum		2	1	2	9	4	1
Maximum		2976	3192	2910	12278	1528	1528

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2000 2nd quarter T2d	2000 4th quarter T4d	2000 1st quarter T1fd	2000 2nd quarter T2fd	2000 4th quarter T4fd	2001 1st quarter T5d
N	Valid	123	127	127	122	128	127
	Missing	26	22	22	27	21	22
Mean		392.81	381.69	204.22	183.89	176.59	429.07
Median		302.00	297.00	155.00	151.50	134.00	315.00
Mode		406	132	48[a]	36[a]	53[a]	95[a]
Std. Deviation		364.924	354.988	187.615	174.308	159.733	396.921
Variance		133169.366	126016.453	35199.253	30383.220	25514.701	157546.003
Skewness		3.097	3.389	3.294	3.401	3.649	3.472
Std. Error of Skewness		.218	.215	.215	.219	.214	.215
Kurtosis		14.310	17.657	19.226	19.475	23.532	19.327
Std. Error of Kurtosis		.433	.427	.427	.435	.425	.427
Range		2696	2774	1528	1399	1361	3196
Minimum		3	4	0	2	2	4
Maximum		2699	2778	1528	1401	1363	3200

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2001 2nd quarter T6d	2001 3rd quarter T7d	2001 4th quarter T8d	homeless decisons taken 2001/2	2001 1st quarter T5fd	2001 2nd quarter T6fd
N	Valid	119	125	132	104	127	119
	Missing	30	24	17	45	22	30
Mean		392.33	469.57	401.82	1662.76	205.61	183.35
Median		324.00	394.00	323.50	1294.50	155.00	153.00
Mode		177	89[a]	426	886[a]	48[a]	109
Std. Deviation		360.328	399.876	350.331	1543.499	186.741	172.698
Variance		129836.239	159900.683	122731.692	2382387.990	34872.175	29824.451
Skewness		3.832	3.183	3.365	3.838	3.328	4.363
Std. Error of Skewness		.222	.217	.211	.237	.215	.222
Kurtosis		23.005	17.263	19.807	22.111	19.531	30.779
Std. Error of Kurtosis		.440	.430	.419	.469	.427	.440
Range		2974	3191	2908	12269	1524	1527
Minimum		2	1	2	9	4	1
Maximum		2976	3192	2910	12278	1528	1528

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2001 3rd quarter T7fd	2001 4th quarter T8fd	full duty accepted 2001	2002 1st quarter T9d	2002 2nd quarter T10d	2002 3rd quarter T11d
N	Valid	125	132	102	128	127	122
	Missing	24	17	47	21	22	27
Mean		215.94	188.23	787.51	428.12	432.17	459.54
Median		161.00	147.00	616.50	351.00	377.00	380.50
Mode		72[a]	59[a]	459	3[a]	149[a]	170[a]
Std. Deviation		194.553	171.779	735.485	379.075	379.541	437.485
Variance		37850.827	29508.131	540937.856	143697.884	144051.065	191393.507
Skewness		3.354	3.007	3.853	3.476	3.544	3.639
Std. Error of Skewness		.217	.211	.239	.214	.215	.219
Kurtosis		18.902	15.054	23.700	19.934	19.906	19.140
Std. Error of Kurtosis		.430	.419	.474	.425	.427	.435
Range		1573	1320	5943	3097	3078	3411
Minimum		0	0	6	3	4	0
Maximum		1573	1320	5949	3100	3082	3411

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2002 4th quarter T12d	homeless decisions taken 2002	2002 1st quarter T9fd	2002 2nd quarter T10fd	2002 3rd quarter T11fd	2002 4th quarter T12fd
N	Valid	126	98	127	127	121	126
	Missing	23	51	22	22	28	23
Mean		440.13	1771.06	194.90	199.34	212.08	200.78
Median		329.50	1417.50	149.00	164.00	153.00	151.00
Mode		140[a]	429	73	82[a]	47[a]	93[a]
Std. Deviation		413.848	1710.103	187.350	188.590	214.381	192.599
Variance		171270.048	2924453.048	35100.188	35566.257	45959.176	37094.206
Skewness		3.010	3.506	3.706	3.940	3.887	3.171
Std. Error of Skewness		.216	.244	.215	.215	.220	.216
Kurtosis		12.866	17.475	22.165	25.136	21.127	13.612
Std. Error of Kurtosis		.428	.483	.427	.427	.437	.428
Range		2970	12555	1548	1602	1653	1281
Minimum		2	10	0	3	0	1
Maximum		2972	12565	1548	1605	1653	1282

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		full duty accepted 2002	2003 1st quarter T13d	2003 2nd quarter T14d	2003 3rd quarter T15d	2003 4th quarter T16d	homeless decisons taken 2003
N	Valid	96	128	116	138	138	105
	Missing	53	21	33	11	11	44
Mean		793.68	473.77	434.90	534.37	480.09	1860.10
Median		565.50	370.50	359.50	421.00	406.00	1454.00
Mode		1104	185[a]	112	201[a]	166[a]	2[a]
Std. Deviation		814.650	425.473	405.597	481.933	409.079	1759.135
Variance		663653.989	181027.094	164509.015	232259.855	167345.598	3094555.018
Skewness		3.980	2.818	3.601	2.957	2.757	3.247
Std. Error of Skewness		.246	.214	.225	.206	.206	.236
Kurtosis		21.542	11.835	18.878	13.044	11.824	15.286
Std. Error of Kurtosis		.488	.425	.446	.410	.410	.467
Range		6084	3034	3099	3558	3023	12714
Minimum		4	1	0	0	1	2
Maximum		6088	3035	3099	3558	3024	12716

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2003 1st quarter T13fd	2003 2nd quarter T14fd	2003 3rd quarter T15fd	2003 4th quarter T16fd	full duty accepted 2003	2004 1st quarter T17d
N	Valid	128	116	138	138	100	132
	Missing	21	33	11	11	49	17
Mean		220.38	215.91	242.52	209.80	840.98	487.12
Median		162.50	180.00	198.00	166.00	671.50	413.00
Mode		104	81[a]	87	62[a]	372	274
Std. Deviation		209.483	206.059	218.260	179.246	838.094	387.995
Variance		43883.309	42460.149	47637.478	32129.253	702401.030	150540.336
Skewness		3.358	3.816	3.316	2.707	3.789	2.460
Std. Error of Skewness		.214	.225	.206	.206	.241	.211
Kurtosis		16.542	20.041	16.358	10.616	18.886	9.032
Std. Error of Kurtosis		.425	.446	.410	.410	.478	.419
Range		1556	1520	1597	1222	5895	2657
Minimum		0	0	0	0	0	7
Maximum		1556	1520	1597	1222	5895	2664

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2004 2nd quarter T18d	2004 3rd quarter T19d	2004 4th quarter T20d	homeless decisions taken 2004	2004 1st quarter T17fd	2004 2nd quarter T18fd
N	Valid	134	148	149	125	133	134
	Missing	15	1	0	24	16	15
Mean		456.48	479.39	430.34	1811.22	220.57	206.16
Median		380.50	391.00	363.00	1518.00	186.00	175.00
Mode		169[a]	123[a]	408	34[a]	99	146[a]
Std. Deviation		382.357	389.304	350.955	1524.352	173.103	163.488
Variance		146196.868	151557.381	123169.281	2323649.030	29964.565	26728.469
Skewness		3.101	2.660	2.643	2.883	2.890	3.041
Std. Error of Skewness		.209	.199	.199	.217	.210	.209
Kurtosis		15.966	11.736	11.202	12.664	12.845	16.130
Std. Error of Kurtosis		.416	.396	.395	.430	.417	.416
Range		3006	2920	2571	11131	1222	1306
Minimum		2	1	1	34	6	2
Maximum		3008	2921	2572	11165	1228	1308

Figure 5 - Univariate analysis - distribution statistics for all outcome variables at County level

Statistics

		2004 3rd quarter T19fd	2004 4th quarter T20fd
N	Valid	148	149
	Missing	1	0
Mean		217.14	196.11
Median		183.50	163.00
Mode		128[a]	97[a]
Std. Deviation		176.403	154.454
Variance		31118.109	23856.034
Skewness		3.115	2.713
Std. Error of Skewness		.199	.199
Kurtosis		16.883	13.855
Std. Error of Kurtosis		.396	.395
Range		1457	1242
Minimum		1	0
Maximum		1458	1242

a. Multiple modes exist. The smallest value is shown

Figure 6 - Univariate analysis - distribution statistics for all outcome variables at PCT level

Statistics

		2000 2nd quarter T2d	2000 4th quarter T4d	2000 1st quarter T1fd	2000 2nd quarter T2fd	2000 4th quarter T4fd	2001 1st quarter T5d
N	Valid	178	183	182	179	183	182
	Missing	21	16	17	20	16	17
Mean		242.32	246.03	131.29	112.36	113.37	275.84
Median		146.50	146.00	81.50	66.00	73.00	178.50
Mode		73[a]	27[a]	48	39[a]	36	69
Std. Deviation		308.239	311.396	159.641	144.351	137.344	341.711
Variance		95011.552	96967.675	25485.244	20837.120	18863.255	116766.470
Skewness		4.349	4.412	4.653	4.946	4.971	4.675
Std. Error of Skewness		.182	.180	.180	.182	.180	.180
Kurtosis		26.583	27.673	33.527	36.885	38.557	32.247
Std. Error of Kurtosis		.362	.357	.358	.361	.357	.358
Range		2689	2773	1528	1398	1359	3196
Minimum		10	5	0	3	4	4
Maximum		2699	2778	1528	1401	1363	3200

Figure 6 - Univariate analysis - distribution statistics for all outcome variables at PCT level

Statistics

		2001 2nd quarter T6d	2001 3rd quarter T7d	2001 4th quarter T8d	homeless decisions taken 2001/2	2001 1st quarter T5fd	2001 2nd quarter T6fd
N	Valid	174	179	184	159	183	173
	Missing	25	20	15	40	16	26
Mean		255.18	290.32	255.66	1072.50	131.27	120.47
Median		157.00	182.00	151.50	649.00	82.00	76.00
Mode		30[a]	46[a]	39[a]	111[a]	48	38
Std. Deviation		317.308	354.216	311.256	1347.271	159.069	148.384
Variance		100684.656	125468.996	96880.248	1815138.707	25302.892	22017.693
Skewness		4.763	4.200	4.410	4.713	4.680	5.632
Std. Error of Skewness		.184	.182	.179	.192	.180	.185
Kurtosis		33.512	26.986	30.195	32.211	33.845	47.609
Std. Error of Kurtosis		.366	.361	.356	.383	.357	.367
Range		2969	3188	2898	12251	1526	1524
Minimum		7	4	12	27	2	4
Maximum		2976	3192	2910	12278	1528	1528

Figure 6 - Univariate analysis - distribution statistics for all outcome variables at PCT level

Statistics

		2001 3rd quarter T7fd	2001 4th quarter T8fd	full duty accepted 2001/2	2002 1st quarter T9d	2002 2nd quarter T10d	2002 3rd quarter T11d
N	Valid	179	184	157	179	182	174
	Missing	20	15	42	20	17	25
Mean		132.76	120.07	507.37	271.66	273.81	292.11
Median		79.00	76.00	309.00	164.00	168.50	172.00
Mode		38[a]	59	154	37	51	91[a]
Std. Deviation		166.421	146.668	628.138	335.106	338.711	386.920
Variance		27695.835	21511.388	394557.760	112296.314	114725.062	149706.849
Skewness		4.711	4.370	4.976	4.570	4.482	4.664
Std. Error of Skewness		.182	.179	.194	.182	.180	.184
Kurtosis		33.154	27.857	36.925	31.038	29.319	29.280
Std. Error of Kurtosis		.361	.356	.385	.361	.358	.366
Range		1570	1315	5930	3088	3074	3405
Minimum		3	5	19	12	8	6
Maximum		1573	1320	5949	3100	3082	3411

Figure 6 - Univariate analysis - distribution statistics for all outcome variables at PCT level

Statistics

		2002 4th quarter T12d	homeless decisions taken 2002/3	2002 1st quarter T9fd	2002 2nd quarter T10fd	2002 3rd quarter T11fd	2002 4th quarter T12fd
N	Valid	182	152	179	182	174	182
	Missing	17	47	20	17	25	17
Mean		271.63	1131.31	124.13	126.32	136.36	123.93
Median		174.00	641.00	79.00	77.50	82.50	83.50
Mode		55	178[a]	31[a]	38[a]	54	44[a]
Std. Deviation		341.482	1483.992	158.863	161.814	186.471	154.993
Variance		116610.025	2202231.248	25237.353	26183.677	34771.329	24022.846
Skewness		4.517	4.419	5.230	5.314	5.041	4.949
Std. Error of Skewness		.180	.197	.182	.180	.184	.180
Kurtosis		27.210	26.658	39.215	41.260	33.318	31.416
Std. Error of Kurtosis		.358	.391	.361	.358	.366	.358
Range		2967	12486	1543	1602	1649	1278
Minimum		5	79	5	3	4	4
Maximum		2972	12565	1548	1605	1653	1282

Figure 6 - Univariate analysis - distribution statistics for all outcome variables at PCT level

Statistics

		full duty accepted 2002/3	2003 1st quarter T13d	2003 2nd quarter T14d	2003 3rd quarter T15d	2003 4th quarter T16d	homeless decisions taken 2003/4
N	Valid	150	185	173	192	191	161
	Missing	49	14	26	7	8	38
Mean		513.45	289.26	279.60	324.09	293.20	1129.50
Median		320.50	188.00	185.00	201.00	182.00	663.00
Mode		1104	68[a]	82[a]	41[a]	166	176[a]
Std. Deviation		693.241	350.563	343.060	418.690	351.736	1423.272
Variance		480582.638	122894.120	117690.357	175301.331	123718.076	2025702.752
Skewness		5.067	4.350	4.892	4.269	4.042	4.886
Std. Error of Skewness		.198	.179	.185	.175	.176	.191
Kurtosis		33.802	25.970	32.935	24.247	23.093	32.502
Std. Error of Kurtosis		.394	.355	.367	.349	.350	.380
Range		6081	3030	3090	3548	3010	12671
Minimum		7	5	9	10	14	45
Maximum		6088	3035	3099	3558	3024	12716

Figure 6 - Univariate analysis - distribution statistics for all outcome variables at PCT level

Statistics

		2003 1st quarter T13fd	2003 2nd quarter T14fd	2003 3rd quarter T15fd	2003 4th quarter T16fd	full duty accepted 2003/4	2004 1st quarter T17d
N	Valid	185	173	192	191	159	187
	Missing	14	26	7	8	40	12
Mean		134.77	137.73	145.45	128.64	530.88	309.24
Median		93.00	91.00	94.00	85.00	361.00	192.00
Mode		37[a]	59[a]	62	41[a]	266[a]	136
Std. Deviation		169.174	174.228	184.902	149.098	688.686	352.750
Variance		28619.883	30355.513	34188.845	22230.179	474288.384	124432.797
Skewness		5.272	5.146	4.918	4.137	5.221	3.310
Std. Error of Skewness		.179	.185	.175	.176	.192	.178
Kurtosis		36.955	34.725	32.280	23.566	34.741	14.885
Std. Error of Kurtosis		.355	.367	.349	.350	.383	.354
Range		1553	1511	1590	1211	5864	2650
Minimum		3	9	7	11	31	14
Maximum		1556	1520	1597	1222	5895	2664

Figure 6 - Univariate analysis - distribution statistics for all outcome variables at PCT level

Statistics

		2004 2nd quarter T18d	2004 3rd quarter T19d	2004 4th quarter T20d	homeless decisions taken 2004/5	2004 1st quarter T17fd	2004 2nd quarter T18fd
N	Valid	189	198	199	183	188	189
	Missing	10	1	0	16	11	10
Mean		286.53	288.27	258.95	1148.58	139.61	131.13
Median		169.00	176.50	163.00	735.00	95.50	90.00
Mode		35	127	69[a]	237[a]	31[a]	23
Std. Deviation		346.117	337.936	305.562	1350.242	152.785	146.412
Variance		119797.293	114200.441	93368.104	1823153.311	23343.245	21436.558
Skewness		3.987	3.998	3.934	3.792	3.916	4.014
Std. Error of Skewness		.177	.173	.172	.180	.177	.177
Kurtosis		23.579	23.227	22.144	20.450	21.889	24.790
Std. Error of Kurtosis		.352	.344	.343	.357	.353	.352
Range		3002	2914	2565	11131	1214	1302
Minimum		6	7	7	34	14	6
Maximum		3008	2921	2572	11165	1228	1308

Figure 6 - Univariate analysis - distribution statistics for all outcome variables at PCT level

Statistics

		2004 3rd quarter T19fd	2004 4th quarter T20fd	full duty accepted 2004/5
N	Valid	198	199	182
	Missing	1	0	17
Mean		129.99	117.73	514.46
Median		87.00	76.00	349.00
Mode		30[a]	46[a]	211[a]
Std. Deviation		144.743	130.724	572.190
Variance		20950.660	17088.825	327401.233
Skewness		5.014	4.250	4.396
Std. Error of Skewness		.173	.172	.180
Kurtosis		38.305	28.976	28.844
Std. Error of Kurtosis		.344	.343	.358
Range		1452	1236	5203
Minimum		6	6	33
Maximum		1458	1242	5236

a. Multiple modes exist. The smallest value is shown

Figure 7a - summary of distribution checks for all variables - Local Authority level

Variables - Local Authority level	histogram normal?	QQplot normal	Skew	kurtosis	histogram / QQplot normal for size groups? 12345	histogram /QQplot normal for council type? BDUCIOM	histogram / QQplot normal for population groups? 12345	KS significant? (√ = no significant deviation from norm)	homogeniety of variance between groups	no. of cases in subsets not normally distributed	parametric tests possible?	normal when transformed? Hist, QQ, KS	normality in groups? C,S,P	Homogenity of variance with transformed groups?	Parametric tests on transformed possible?
T2d	x	x	/	/	xx√xx	xxxx√√√	xx√xx	x	/	/	x	√√√	n/a	/	√
T4d	x	x	/	/	xx√x√	xxxxxxx	xx√x√	x	/	/	x	√√√	n/a	/	√
T1fd	x	x	/	/	xx√xx	x√xxx√x	√xxxx	x	/	/	x	√√x	√√x	x	√
T2fd	x	x	/	/	xx√xx	x√xx√√x	√√xxx	x	/	/	x	√√x	√√x	x	√
T4fd	x	x	/	/	xx√xx	xxxxxxx	√√xxx	x	/	/	x	√√√	n/a	/	√
T5d	x	x	/	/	xx√xx	xxxxx√x	√x√xx	x	/	/	x	√√√	n/a	/	√
T6d	x	x	/	/	xx√xx	xxxxx√x	√x√x√	xx√√√	x	262	x	√√√	n/a	/	√
T7d	x	x	/	/	xx√xx	xxxx√√√	√x√xx	x	/	/	x	√√√	n/a	/	√
T8d	x	x	/	/	xx√xx	xxxxxxx	√x√√√	xx√√√	x	276	x	√√√	n/a	/	√
T2001d	x	x	/	/	xx√xx	xxxx√√x	xx√√x	x	/	/	x	√√√	n/a	/	√
T5fd	x	x	/	/	xx√xx	x√xxx√x	√x√xx	x	/	/	x	√√x	√√x	x	√
T6fd	x	x	/	/	xx√√x	√√√x√xx	√x√xx	xx√x√√x	x	252	x	√√x	√√x	x	√
T7fd	x	x	/	/	xx√xx	√√√x√xx	√x√xx	xxxx√√x	x	296	x	√√√	n/a	/	√
T8fd	x	x	/	/	xx√xx	√√xx√√x	xx√xx	√xxx√√x	x	211	x	√√x	x√x	x	√
T2001fd	x	x	/	/	xx√xx	√√xx√xx	xx√√√	xx√√√	x	240	x	√√x	x√x	x	√
T9d	x	x	/	/	xxxxx	xx√√√√√	√x√xx	xxxx√√x	x	299	x	√√√	n/a	/	√
T10d	x	x	/	/	xx√xx	xx√√√√x	√√√√x	xx√√√	x	269	x	√√x	√√√	x	√
T11d	x	x	/	/	xx√xx	x√√x√√x	√x√xx	xxxx√√x	x	291	x	√√√	n/a	/	√
T12d	x	x	/	/	xx√xx	x√xx√xx	xx√xx	x	/	/	x	√√√	n/a	/	√
T2002d	x	x	/	/	xx√xx	x√xx√√x	√√√xx	xx√√√	x	241	x	√√√	n/a	/	√
T9fd	x	x	/	/	xxxxx	x√xx√xx	xx√√x	x	/	/	x	√√x	x√√	x	√
T10fd	x	x	/	/	xx√xx	√√xxxxx	√x√√x	xx√√√	x	269	x	√√x	x√x	x	√
T11fd	x	x	/	/	xx√xx	x√√x√√x	√x√√x	√xxxx√x	x	278	x	√√x	√√√	x	√
T12fd	x	x	/	/	xx√xx	√√√x√xx	xxxxx	√xxx√√x	x	209	x	√√√	n/a	/	√
T2002fd	x	x	/	/	xxxxx	√√√x√xx	√x√xx	√xxx√√x	x	178	x	√√x	x√x	x	√

Figure 7a - summary of distribution checks for all variables - Local Authority level

Variables - Local Authority level	histogram normal?	QQplot normal	Skew	kurtosis	histogram / QQplot normal for size groups? 12345	histogram /QQplot normal for council type? BDUCIOM	histogram / QQplot normal for population groups? 12345	KS significant? (√ = no significant deviation from norm)	homogeniety of variance between groups	no. of cases in subsets not normally distributed	parametric tests possible?	normal when transformed? Hist, QQ, KS	normality in groups? C,S,P	Homogenity of variance with transformed groups?	Parametric tests on transformed possible?
T13d	x	x	/	/	xxxxx	x√√x√√x	√x√xx	xxxx√√x	x	304	x	√√x	√√x	x	√
T14d	x	x	/	/	xxxxx	√√√x√xx	xx√xx	xxxxx√x	x	295	x	√√√	n/a	/	√
T15d	x	x	/	/	xx√xx	x√√x√xx	√x√xx	x	/	/	x	√√√	n/a	/	√
T16d	x	x	/	/	xx√xx	x√xx√√x	√x√xx	x	/	/	x	√√√	n/a	/	√
T2003d	x	x	/	/	xx√xx	x√√x√xx	xxxxx	x	/	/	x	√√x	x√x	x	√
T13fd	x	x	/	/	xxxxx	√√√x√xx	√x√xx	xxxx√√x	x	304	x	√√x	x√√	x	√
T14fd	x	x	/	/	xxxxx	√√√xxxx	√x√xx	x	/	/	x	√√x	x√√	x	√
T15fd	x	x	/	/	xx√√x	√√√xx√x	√x√xx	x√xx√√x	x	186	x	√√x	x√√	x	√
T16fd	x	x	/	/	xx√xx	√√√x√xx	√x√√x	√xxx√√x	x	281	x	√√x	x√√	x	√
T2003fd	x	x	/	/	xx√√x	√√√xxxx	√x√√x	xx√√√	x	241	x	√√√	n/a	/	√
T17d	x	x	/	/	xx√xx	√√√x√x√	√x√xx	xx√x√xx	x	282	x	√√x	√√√	x	√
T18d	x	x	/	/	xx√√x	x√x√x√	√x√xx	x	/	/	x	√√√	n/a	/	√
T19d	x	x	/	/	xx√√x	x√xx√xx	√x√xx	x	/	/	x	√√x	x√√	x	√
T20d	x	x	/	/	xxx√x	x√xxxxx	√x√xx	x	/	/	x	√√x	x√√	x	√
T2004d	x	x	/	/	xx√xx	√√x√xx√	√xxxx	xx√x√xx	x	273	x	√√x	√√√	x	√
T17fd	x	x	/	/	xxx√x	√√√√√xx	√x√√√	xxxx√√x	x	308	x	√√√	n/a	/	√
T18fd	x	x	/	/	xxxxx	√√xx√√x	√x√xx	xxxx√√x	x	308	x	√√x	xxx	x	√
T19fd	x	x	/	/	xx√xx	√√√x√√√	√x√xx	xxxx√√x	x	320	x	√√x	x√√	x	√
T20fd	x	x	/	/	xx√xx	√√√x√√√	√x√xx	xx√x√√x	x	275	x	√√x	√√√	x	√
T2004fd	x	x	/	/	xxxxx	√√xx√√x	√√√xx	√xxx√√x	x	207	x	√√x	x√x	x	√
gen1	x	x	/	/	x√xx√	xxxx√xx	xxxx√	x	/	/	x	√√x	xxx	x	x
gen2	√	x	3.511	22.481	√√√xx	√√√x√√x	xxxxx	√√xx√√x	x	96	√	n/a	n/a	/	n/a
gen3	√	x	3.5	22.406	√x√xx	√√√x√√x	xxxxx	√√xx√√x	x	96	√	n/a	n/a	/	n/a
gen4	√	x	3.518	22.517	x√√xx	√√√x√√x	xxxxx	√xxx√√x	x	/	√	n/a	n/a	/	n/a
gen5	x	x	/	/	√√√xx	/	√x√xx	x	/	/	x	n/a	n/a	/	n/a

Figure 7a - summary of distribution checks for all variables - Local Authority level

Variables - Local Authority level	histogram normal?	QQplot normal	Skew	kurtosis	histogram / QQplot normal for size groups? 12345	histogram /QQplot normal for council type? BDUCIOM	histogram / QQplot normal for population groups? 12345	KS significant? (√ = no significant deviation from norm)	homogeniety of variance between groups	no. of cases in subsets not normally distributed	parametric tests possible?	normal when transformed? Hist, QQ, KS	normality in groups? C,S,P	Homogenity of variance with transformed groups?	Parametric tests on transformed possible?
gen6	x	x	/	/	xx√√√	xxxx√√√	xx√xx	xx√√√	/	/	x	√√x	√xx	x	√
migration1	√	√	0.414	0.213	√√√√√	√√√√√√√	√√x√√	√x√√√√√	√	/	√	n/a	n/a	/	n/a
migration2	√	x	2.246	6.507	√√√xx	√√√xx√x	√√x√x	√x√√√	x	/	√	n/a	n/a	/	n/a
migration3	√	x	2.76	11.283	xx√xx	xx√x√√x	xxxxx	x	/	/	x	√√√	√√√	√	√
deinst1	x	x	/	/	xxxxx	xxxxxx√	xxx√x	x	/	/	x	√√x	xxx	x	√
sexage1	√	x	3.903	27.931	x√√xx	√√√x√√x	√√√xx	√xxx√√x	x	224	x	√√x	√xx	x	√
sexage2	√	x	4.02	27.562	x√√√x	√√√x√√x	√√√√x	√x√√√	x	133	√	n/a	n/a	/	n/a
sexage3	√	x	3.679	24.36	xx√xx	√x√x√√x	√√√√x	√xxx√√√	x	195	x	√√x	√√√	x	√
sexage4	√	x	3.384	20.513	xx√xx	√√√x√√x	√√√√x	√x√x√√√	x	149	√	n/a	n/a	/	n/a
sexage5	x	x	/	/	xx√x√	√xxxx√x	√x√√√	xx√xx	x	308	x	√√x	√√x	x	√
sexage6	x	x	/	/	xx√x√	√xxxx√x	√x√√x	xx√xx	x	308	x	√√x	√√√	x	√
sexage7	x	x	/	/	xx√xx	√xxxx√x	xx√√x	x	/	/	x	√√x	√√√	x	√
sexage8	x	x	/	/	xx√xx	xx√xx√√	xx√√x	x	/	/	x	√√x	√√√	√	√
housing1	√	√	0.039	-0.55	√√√xx	√√x√√√√	√√√√x	√√x√√√√	x	/	√	n/a	n/a	/	n/a
housing2	√	√	-0.118	0.429	√√√xx	√√√√√√√	√√√√√	√	√	/	√	n/a	n/a	/	n/a
housing3	√	√	0.214	-0.646	√√√xx	√√√√√√√	√√xx√	√xx√√√√	x	174	√	n/a	n/a	/	n/a
ethnicity1	√	x	4.044	15.593	√x√xx	√√√x√√x	xx√xx	√√√x√√x	x	156	√	n/a	n/a	/	n/a
ethnicity2	x	x	/	/	xx√xx	xxxx√√x	√xxxx	x	/	/	x	√√x	√xx	x	√
ethnicity3	x	x	/	/	xxxxx	xxxxxxx	xxxxx	x	/	/	x	√√x	√xx	√	√
ethnicity4	x	x	/	/	xxxxx	xxxxx√x	xxxxx	x	/	/	x	√xx	√x√	x	√
ethnicity5	x	x	/	/	xxxxx	xxxx√√x	xxxxx	x	/	/	x	√xx	√xx	x	√
deinst15	x	x	/	/	xxxxx	x√xx√√√	√x√√x	xxxx√√√	x	293	x	√√x	√x√	√	√
deinst16	x	x	/	/	xxxx√	√√xxx√x	√xx√x	x	/	/	x	√√x	√x√	√	√
deinst17	x	x	/	/	xxxxx	√√xx√√√	xx√√x	xxxx√√x	x	321	x	√√x	xxx	x	√
deinst18	x	x	/	/	xx√xx	√xxx√√x	√x√√x	xxx√√	x	335	x	√√x	√x√	x	√

Figure 7a - summary of distribution checks for all variables - Local Authority level

Variables - Local Authority level	histogram normal?	QQplot normal	Skew	kurtosis	histogram / QQplot normal for size groups? 12345	histogram /QQplot normal for council type? BDUCIOM	histogram / QQplot normal for population groups? 12345	KS significant? (√ = no significant deviation from norm)	homogeniety of variance between groups	no. of cases in subsets not normally distributed	parametric tests possible?	normal when transformed? Hist, QQ, KS	normality in groups? C,S,P	Homogenity of variance with transformed groups?	Parametric tests on transformed possible?
relationship1	√	x	3.588	23.206	xx√xx	√√√x√√x	√√√√x	x√xx√√x	x	193	x	√√x	xxx	x	√
relationship2	x	x	/	/	xx√xx	√√√xx√x	√xx√x	√√√x√√x	x	50	√	n/a	n/a	/	n/a
relationship3	√	x	3.571	22.014	xx√xx	√√√xx√x	√√√√x	√√√x√√√	x	22	√	n/a	n/a	/	n/a
relationship4	√	x	4.376	30.565	x√√xx	√√√x√√x	√√x√x	√√√x√√x	x	50	√	n/a	n/a	/	n/a
relationship5	√	x	2.981	14.117	xx√xx	√√√x√√x	√√√√x	√√xx√√x	x	96	√	n/a	n/a	/	n/a
poverty1	x	x	/	/	xx√x√	√√√x√√√	√x√√√	√x√x√	x	66	√	n/a	n/a	/	n/a
poverty2	x	x	/	/	xx√xx	√√√x√√x	√x√√x	√xxx√√x	x	224	x	√√x	√x√	x	√
poverty3	x	x	/	/	xx√xx	√xxx√√√	xxxx√	xxxx√xx	x	340	x	√√x	√√√	√	√
poverty4	x	x	/	/	xx√xx	xxxx√√x	xxx√x	x	/	/	x	√√x	√√√	√	√
poverty5	x	x	/	/	xx√xx	√√xx√√√	xx√√x	xxxx√√x	x	321	x	√√x	√x√	√	√
poverty6	√	x	3.827	25.302	xx√xx	√√√x√√x	√x√√x	√√xx√√x	x	96	√	n/a	n/a	/	n/a
poorhealth1	√	x	3.576	21.781	x√√x√	√√√x√√√	√√√xx	√xxx√√√	x	196	x	√√x	√x√	x	√

Figure 7b - summary of distribution checks for all variables -County level

Variables - County level	histogram normal?	QQ plot normal?	Skew	kurtosis	KS significant? (√ = no significant deviation from norm)	homogeneity of variance?	parametric tests possible?	normal when transformed? Hist,QQ,KS	parametric tests possible on transformed?
T2d[a]	x	x	/	/	x	/	x	√√√	√
T4d[a]	x	x	/	/	x	/	x	√√√	√
T1fd[a]	x	x	/	/	x	/	x	√√√	√
T2fd[a]	x	x	/	/	x	/	x	√√√	√
T4fd[a]	x	x	/	/	x	/	x	√√√	√
T5d[a]	x	x	/	/	x	/	x	√√√	√
T6d[a]	x	x	/	/	x	/	x	√√√	√
T7d[a]	x	x	/	/	x	/	x	√√√	√
T8d[a]	x	x	/	/	x	/	x	√√√	√
T2001d[a]	x	x	/	/	x	/	x	√√√	√
T5fd[a]	x	x	/	/	x	/	x	√√√	√
T6fd[a]	x	x	/	/	x	/	x	√√√	√
T7fd[a]	x	x	/	/	x	/	x	√√√	√
T8fd[a]	x	x	/	/	x	/	x	√√x	√
T2001fd[a]	x	x	/	/	x	/	x	√√√	√
T9d[a]	x	x	/	/	x	/	x	√√√	√
T10d[a]	x	x	/	/	x	/	x	√√√	√
T11d[a]	x	x	/	/	x	/	x	√√x	√
T12d[a]	x	x	/	/	x	/	x	√√√	√
T2002d[a]	x	x	/	/	x	/	x	√√√	√
T9fd[a]	x	x	/	/	x	/	x	√√√	√
T10fd[a]	x	x	/	/	x	/	x	√√√	√
T11fd[a]	x	x	/	/	x	/	x	√√x	√
T12fd[a]	x	x	/	/	x	/	x	√√x	√
T2002fd[a]	x	x	/	/	x	/	x	√√x	√
T13d[a]	x	x	/	/	x	/	x	√√√	√
T14d[a]	x	x	/	/	x	/	x	√√√	√
T15d[a]	x	x	/	/	x	/	x	√√√	√
T16d[a]	x	x	/	/	x	/	x	√√√	√
T2003d[a]	x	x	/	/	x	/	x	√√x	√
T13fd[a]	x	x	/	/	x	/	x	√√x	√
T14fd[a]	x	x	/	/	x	/	x	√√x	√
T15fd[a]	x	x	/	/	x	/	x	√√x	√
T16fd[a]	x	x	/	/	x	/	x	√√√	√
T2003fd[a]	x	x	/	/	x	/	x	√√x	√
T17d[a]	√	x	/	/	x	/	x	√√√	√
T18d[a]	√	√	/	/	x	/	√	√√√	√
T19d[a]	√	x	/	/	x	/	x	√√√	√
T20d[a]	√	x	/	/	x	/	x	√√√	√
T2004d[a]	x	x	/	/	x	/	x	√√√	√
T17fd[a]	√	x	/	/	x	/	x	√√√	√

Figure 7b - summary of distribution checks for all variables -County level									
Variables - County level	histogram normal?	QQ plot normal?	Skew	kurtosis	KS significant? (√ = no significant deviation from norm)	homogeniety of variance?	parametric tests possible?	normal when transformed? Hist,QQ,KS	parametric tests possible on transformed?
T18fd[a]	√	x	/	/	x	/	x	√√√	√
T19fd[a]	√	x	/	/	x	/	x	√√√	√
T20fd[a]	√	x	/	/	x	/	x	√√x	√
T2004fd[a]	√	x	/	/	x	/	x	√√√	√
deinst2	√	√	0.662	-0.114	√	/	√	n/a	n/a
deinst3	√	x	1.447	1.948	x	/	√	n/a	n/a
deinst4	√	x	2.249	6.717	x	/	√	n/a	n/a
deinst5	√	x	2.39	8.589	x	/	√	n/a	n/a
deinst6	√	x	1.76	4.062	x	/	√	n/a	n/a
deinst7	√	x	1.928	4.388	x	/	√	n/a	n/a
deinst8	√	x	1.937	5.083	x	/	√	n/a	n/a
deinst9	√	x	2.05	6.575	x	/	√	n/a	n/a
deinst10	√	x	2.183	7.088	x	/	√	n/a	n/a
deinst11	x	x	/	/	x	/	x	x√x	x
deinst12	x	x	/	/	x	/	x	x√x	x
deinst13	x	x	/	/	x	/	x	xxx	x
deinst14	x	x	/	/	x	/	x	x√x	x
housing4	x	x	/	/	x	/	x	√xx	x
housing5	x	x	/	/	x	/	x	√xx	x
housing6	x	x	/	/	x	/	x	√√x	√
housing7	x	x	/	/	x	/	x	√√x	√
housing8	x	x	/	/	x	/	x	√xx	x
housing9	x	x	/	/	x	/	x	√√x	√
drugs1	x	x	/	/	x	/	x	√√x	√
drugs2	x	x	/	/	x	/	x	√√x	√
drugs3	x	√	/	/	x	/	√	n/a	n/a
drugs4	x	x	/	/	x	/	x	√√x	√
drugs5	x	√	/	/	√	/	√	n/a	n/a
drugs6	√	x	/	/	x	/	√	n/a	n/a

Figure 7c - summary of distribution checks for all variables - PCT level

Variables - PCT level	histogram normal?	QQ plot normal?	Skew	kurtosis	KS significant? (√ = no significant deviation from norm)	parametric tests possible?	normal when transformed? Hist,QQ,KS	parametric tests possible on transformed data?
T2d[b]	x	x	/	/	x	x	√√√	√
T4d[b]	x	x	/	/	x	x	√√√	√
T1fd[b]	x	x	/	/	x	x	√√√	√
T2fd[b]	x	x	/	/	x	x	√√√	√
T4fd[b]	x	x	/	/	x	x	√√x	√
T5d[b]	x	x	/	/	x	x	√√√	√
T6d[b]	x	x	/	/	x	x	√√√	√
T7d[b]	x	x	/	/	x	x	√√√	√
T8d[b]	x	x	/	/	x	x	√√√	√
T2001d[b]	x	x	/	/	x	x	√√√	√
T5fd[b]	x	x	/	/	x	x	√√√	√
T6fd[b]	x	x	/	/	x	x	√√√	√
T7fd[b]	x	x	/	/	x	x	√√√	√
T8fd[b]	x	x	/	/	x	x	√√x	√
T2001fd[b]	x	x	/	/	x	x	√√√	√
T9d[b]	x	x	/	/	x	x	√√√	√
T10d[b]	x	x	/	/	x	x	√√√	√
T11d[b]	x	x	/	/	x	x	√√√	√
T12d[b]	x	x	/	/	x	x	√√√	√
T2002d[b]	x	x	/	/	x	x	√√√	√
T9fd[b]	x	x	/	/	x	x	√√√	√
T10fd[b]	x	x	/	/	x	x	√√√	√
T11fd[b]	x	x	/	/	x	x	√√√	√
T12fd[b]	x	x	/	/	x	x	√√√	√
T2002fd[b]	x	x	/	/	x	x	√√√	√
T13d[b]	x	x	/	/	x	x	√√√	√
T14d[b]	x	x	/	/	x	x	√√√	√
T15d[b]	x	x	/	/	x	x	√√√	√
T16d[b]	x	x	/	/	x	x	√√√	√
T2003d[b]	x	x	/	/	x	x	√√√	√
T13fd[b]	x	x	/	/	x	x	√√√	√
T14fd[b]	x	x	/	/	x	x	√√√	√
T15fd[b]	x	x	/	/	x	x	√√x	√
T16fd[b]	x	x	/	/	x	x	√√x	√
T2003fd[b]	x	x	/	/	x	x	√√√	√
T17d[b]	x	x	/	/	x	x	√√√	√
T18d[b]	x	x	/	/	x	x	√√√	√
T19d[b]	x	x	/	/	x	x	√√√	√
T20d[b]	x	x	/	/	x	x	√√√	√
T2004d[b]	x	x	/	/	x	x	√√√	√
T17fd[b]	x	x	/	/	x	x	√√√	√

Figure 7c - summary of distribution checks for all variables - PCT level									
Variables - PCT level	histogram normal?	QQ plot normal?	Skew	kurtosis	KS significant? (√ = no significant deviation from norm)	parametric tests possible?	normal when transformed? Hist,QQ,KS	parametric tests possible on transformed data?	
T18fd[b]	x	x	/	/	x	x	√√√	√	
T19fd[b]	x	x	/	/	x	x	√√x	√	
T20fd[b]	x	x	/	/	x	x	√√√	√	
T2004fd[b]	x	x	/	/	x	x	√√√	√	
poorhealth2	√	x	4.763	38.092	x	x	√√√	√	
poorhealth3	√	x	2.688	11.705	x	x	√√√	√	

Figure 8 - Univariate analysis - Frequencies for the different splits into groups

Council type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Borough	97	27.5	27.5	27.5
	District	128	36.3	36.3	63.7
	Unitary	46	13.0	13.0	76.8
	City	22	6.2	6.2	83.0
	ILB	13	3.7	3.7	86.7
	OLB	19	5.4	5.4	92.1
	Met Borough	28	7.9	7.9	100.0
	Total	353	100.0	100.0	

size in hectares grouped

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	240	68.0	68.0	68.0
	2	68	19.3	19.3	87.3
	3	32	9.1	9.1	96.3
	4	8	2.3	2.3	98.6
	5	5	1.4	1.4	100.0
	Total	353	100.0	100.0	

total population grouped

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	137	38.8	38.8	38.8
	2	153	43.3	43.3	82.2
	3	45	12.7	12.7	94.9
	4	13	3.7	3.7	98.6
	5	5	1.4	1.4	100.0
	Total	353	100.0	100.0	

Blank

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - Local Authority level

Statistics

		logT2d	logT4d	logT1fd	logT2fd	logT4fd	logT5d	logT6d	logT7d
N	Valid	325	329	326	325	329	326	318	326
	Missing	28	24	27	28	24	27	35	27
Mean		1.9614657	1.9618651	1.7047417	1.6519084	1.6493420	2.0175844	1.9809823	2.0252453
Median		1.9344985	1.9294189	1.6812412	1.6627578	1.6334685	1.9889989	1.9637878	2.0086002
Mode		1.623249	1.447158[a]	1.579784	1.602060	1.518514	1.806180[a]	1.380211[a]	1.707570
Std. Deviation		.48122253	.47920325	.46091580	.44560981	.44863702	.46764646	.47806442	.48802687
Variance		.232	.230	.212	.199	.201	.219	.229	.238
Skewness		-.107	-.070	-.166	.042	.060	-.032	-.119	-.097
Std. Error of Skewness		.135	.134	.135	.135	.134	.135	.137	.135
Kurtosis		.327	.417	1.179	.467	.399	.408	.475	.402
Std. Error of Kurtosis		.270	.268	.269	.270	.268	.269	.273	.269
Range		2.954243	3.142859	3.184407	2.845718	2.833784	3.028164	2.996658	3.203169
Minimum		.477121	.301030	.000000	.301030	.301030	.477121	.477121	.301030
Maximum		3.431364	3.443889	3.184407	3.146748	3.134814	3.505286	3.473779	3.504199

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - Local Authority level

Statistics

		logT8d	logT2001d	logT5fd	logT6fd	logT7fd	logT8fd	logT2001fd	logT9d
N	Valid	332	291	327	317	326	332	290	328
	Missing	21	62	26	36	27	21	63	25
Mean		1.9717861	2.60498157	1.7095025	1.6779197	1.7131391	1.6519305	2.28902966	1.9946953
Median		1.9469363	2.57634135	1.6812412	1.6720979	1.6989700	1.6283589	2.26126124	1.9731279
Mode		1.462398[a]	2.049218[a]	1.579784	1.204120[a]	1.414973[a]	1.477121	2.012837[a]	1.763428[a]
Std. Deviation		.48602563	.463106209	.45099670	.45769575	.45853016	.47265777	.447926194	.48274257
Variance		.236	.214	.203	.209	.210	.223	.201	.233
Skewness		-.074	.044	-.043	-.219	-.100	-.133	.051	-.069
Std. Error of Skewness		.134	.143	.135	.137	.135	.134	.143	.135
Kurtosis		.395	.384	.912	1.090	.842	.804	.647	.333
Std. Error of Kurtosis		.267	.285	.269	.273	.269	.267	.285	.268
Range		2.986921	3.089163	3.184407	3.184407	3.197005	3.120903	2.996366	3.014381
Minimum		.477121	1.000000	.000000	.000000	.000000	.000000	.778151	.477121
Maximum		3.464042	4.089163	3.184407	3.184407	3.197005	3.120903	3.774517	3.491502

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - Local Authority level

Statistics

		logT10d	logT11d	logT12d	logT2002d	logT9fd	logT10fd	logT11fd	logT12fd
N	Valid	328	319	330	287	328	328	319	330
	Missing	25	34	23	66	25	25	34	23
Mean		2.0095097	2.0306238	2.0202794	2.60525755	1.6789236	1.7008902	1.7282793	1.7107113
Median		1.9661354	2.0211893	2.0000000	2.56466606	1.6532125	1.6720979	1.6989700	1.7032701
Mode		1.579784	1.897627	1.892095	2.004321[a]	1.505150	1.556303[a]	1.414973	1.414973
Std. Deviation		.47161436	.48487758	.46899577	.473589986	.45310070	.44242347	.44152547	.43498105
Variance		.222	.235	.220	.224	.205	.196	.195	.189
Skewness		.108	-.260	-.131	.010	-.130	.142	-.064	-.122
Std. Error of Skewness		.135	.137	.134	.144	.135	.135	.137	.134
Kurtosis		-.037	1.396	.674	.647	1.044	.353	1.565	.998
Std. Error of Kurtosis		.268	.272	.268	.287	.268	.268	.272	.268
Range		2.790004	3.533009	2.996074	3.057804	3.190051	2.904716	3.218536	2.807197
Minimum		.698970	.000000	.477121	1.041393	.000000	.301030	.000000	.301030
Maximum		3.488974	3.533009	3.473195	4.099197	3.190051	3.205746	3.218536	3.108227

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - Local Authority level

Statistics

		logT2002fd	logT13d	logT14d	logT15d	logT16d	logT2003d	logT13fd	logT14fd
N	Valid	284	331	312	341	342	290	331	312
	Missing	69	22	41	12	11	63	22	41
Mean		2.29403526	2.0603486	2.0543775	2.0891513	2.0590889	2.66183017	1.7576709	1.7648809
Median		2.25041315	2.0413927	2.0374265	2.0899051	2.0293838	2.65417654	1.7481880	1.7558749
Mode		2.158362	1.544068[a]	1.591065[a]	1.623249	1.851258	2.540329	1.579784	1.612784
Std. Deviation		.429226531	.47349117	.45882477	.47436269	.46322263	.460079781	.43548844	.43488221
Variance		.184	.224	.211	.225	.215	.212	.190	.189
Skewness		.125	-.308	-.297	-.194	-.066	-.385	-.227	-.193
Std. Error of Skewness		.145	.134	.138	.132	.132	.143	.134	.138
Kurtosis		1.201	1.154	1.441	1.293	.729	2.046	1.293	1.327
Std. Error of Kurtosis		.288	.267	.275	.263	.263	.285	.267	.275
Range		3.085576	3.181272	3.491362	3.551328	3.179695	3.627263	3.192289	3.182129
Minimum		.698970	.301030	.000000	.000000	.301030	.477121	.000000	.000000
Maximum		3.784546	3.482302	3.491362	3.551328	3.480725	4.104385	3.192289	3.182129

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - Local Authority level

Statistics

		logT15fd	logT16fd	logT2003fd	logT17d	logT18d	logT19d	logT20d	logT2004d
N	Valid	341	342	289	336	337	352	353	326
	Missing	12	11	64	17	16	1	0	27
Mean		1.7749473	1.7354674	2.35065313	2.0847043	2.0422625	2.0657536	2.0045172	2.65607621
Median		1.7558749	1.7242759	2.33445375	2.0211696	2.0043214	2.0252865	1.9731279	2.59603829
Mode		1.380211[a]	1.322219	2.113943	1.778151	1.556303[a]	1.763428[a]	1.322219[a]	2.250420[a]
Std. Deviation		.43776765	.42837177	.436970852	.45954871	.46920291	.45492461	.47635503	.451672081
Variance		.192	.184	.191	.211	.220	.207	.227	.204
Skewness		-.091	-.003	-.478	.050	.012	-.029	-.156	.140
Std. Error of Skewness		.132	.132	.143	.133	.133	.130	.130	.135
Kurtosis		1.251	.843	3.275	.386	.299	.732	.680	.235
Std. Error of Kurtosis		.263	.263	.286	.265	.265	.259	.259	.269
Range		3.203577	3.087426	3.770557	2.948576	3.001301	3.164650	3.109410	2.968716
Minimum		.000000	.000000	.000000	.477121	.477121	.301030	.301030	1.079181
Maximum		3.203577	3.087426	3.770557	3.425697	3.478422	3.465680	3.410440	4.047898

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - Local Authority level

Statistics

		logT17fd	logT18fd	logT19fd	logT20fd	logT2004fd
N	Valid	337	337	352	353	326
	Missing	16	16	1	0	27
Mean		1.7754246	1.7420321	1.7632742	1.6930826	2.34490143
Median		1.7403627	1.7242759	1.7363782	1.6720979	2.32118279
Mode		1.568202	1.380211	1.491362	1.342423	1.897627
Std. Deviation		.42524863	.43972443	.41552181	.45134305	.421197936
Variance		.181	.193	.173	.204	.177
Skewness		-.019	-.069	-.072	-.269	-.181
Std. Error of Skewness		.133	.133	.130	.130	.135
Kurtosis		.790	.713	1.112	1.283	2.527
Std. Error of Kurtosis		.265	.265	.259	.259	.269
Range		3.089552	3.116940	3.164055	3.094471	3.719083
Minimum		.000000	.000000	.000000	.000000	.000000
Maximum		3.089552	3.116940	3.164055	3.094471	3.719083

a. Multiple modes exist. The smallest value is shown

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - County level

Statistics

		logT2d	logT4d	logT1fd	logT2fd	logT4fd	logT5d	logT6d	logT7d
N	Valid	123	127	127	122	128	127	119	125
	Missing	26	22	22	27	21	22	30	24
Mean		2.4432691	2.4370170	2.1447177	2.1059322	2.1028655	2.4872438	2.4456822	2.5394951
Median		2.4814426	2.4742163	2.1931246	2.1832115	2.1154543	2.4996871	2.5118834	2.5965971
Mode		2.609594	2.123852	1.690196[a]	1.568202[a]	1.732394[a]	1.982271[a]	2.250420	1.954243[a]
Std. Deviation		.40145068	.38627232	.43981111	.40607897	.38752184	.39002572	.42088235	.38405729
Variance		.161	.149	.193	.165	.150	.152	.177	.148
Skewness		-1.076	-.916	-1.319	-.695	-.775	-1.012	-1.763	-1.617
Std. Error of Skewness		.218	.215	.215	.219	.214	.215	.222	.217
Kurtosis		3.568	2.986	4.191	1.368	1.839	3.445	6.929	8.288
Std. Error of Kurtosis		.433	.427	.427	.435	.425	.427	.440	.430
Range		2.829304	2.744919	3.184407	2.669627	2.657693	2.806316	2.996658	3.203169
Minimum		.602060	.698970	.000000	.477121	.477121	.698970	.477121	.301030
Maximum		3.431364	3.443889	3.184407	3.146748	3.134814	3.505286	3.473779	3.504199

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - County level

Statistics

		logT8d	logT2001d	logT5fd	logT6fd	logT7fd	logT8fd	logT2001fd	logT9d
N	Valid	132	104	127	119	125	132	102	128
	Missing	17	45	22	30	24	17	47	21
Mean		2.4540705	3.08719607	2.1620082	2.1155631	2.1938585	2.1059258	2.75096498	2.4791980
Median		2.5112018	3.11236595	2.1931246	2.1875207	2.2095150	2.1702518	2.79062999	2.5465357
Mode		2.630428	2.947924[a]	1.690196[a]	2.041393	1.863323[a]	1.778151[a]	2.662758	.602060[a]
Std. Deviation		.42633081	.376158783	.39578631	.40908998	.39215692	.46345407	.391720244	.43268881
Variance		.182	.141	.157	.167	.154	.215	.153	.187
Skewness		-1.673	-1.528	-.660	-1.313	-1.412	-1.805	-1.144	-1.666
Std. Error of Skewness		.211	.237	.215	.222	.217	.211	.239	.214
Kurtosis		5.957	8.368	.934	4.238	6.936	6.512	4.620	5.279
Std. Error of Kurtosis		.419	.469	.427	.440	.430	.419	.474	.425
Range		2.986921	3.089163	2.485437	2.883377	3.197005	3.120903	2.929419	2.889442
Minimum		.477121	1.000000	.698970	.301030	.000000	.000000	.845098	.602060
Maximum		3.464042	4.089163	3.184407	3.184407	3.197005	3.120903	3.774517	3.491502

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - County level

Statistics

		logT10d	logT11d	logT12d	logT2002d	logT9fd	logT10fd	logT11fd	logT12fd
N	Valid	127	122	126	98	127	127	121	126
	Missing	22	27	23	51	22	22	28	23
Mean		2.4965283	2.5029441	2.4893165	3.08590539	2.1193713	2.1438624	2.1616345	2.1536290
Median		2.5774918	2.5814643	2.5191590	3.15181960	2.1760913	2.2174839	2.1875207	2.1818060
Mode		2.176091[a]	2.232996[a]	2.250420	2.633468[a]	1.869232	2.045323	1.681241[a]	1.973128[a]
Std. Deviation		.40036697	.45587084	.41709181	.445423203	.45908797	.41632536	.44914764	.40461893
Variance		.160	.208	.174	.198	.211	.173	.202	.164
Skewness		-1.503	-2.324	-1.536	-1.879	-1.631	-1.064	-1.891	-1.411
Std. Error of Skewness		.215	.219	.216	.244	.215	.215	.220	.216
Kurtosis		5.106	10.812	6.476	7.440	5.345	2.365	7.879	5.976
Std. Error of Kurtosis		.427	.435	.428	.483	.427	.427	.437	.428
Range		2.790004	3.533009	2.996074	3.057804	3.190051	2.603686	3.218536	2.807197
Minimum		.698970	.000000	.477121	1.041393	.000000	.602060	.000000	.301030
Maximum		3.488974	3.533009	3.473195	4.099197	3.190051	3.205746	3.218536	3.108227

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - County level

Statistics

		logT2002fd	logT13d	logT14d	logT15d	logT16d	logT2003d	logT13fd	logT14fd
N	Valid	96	128	116	138	138	105	128	116
	Missing	53	21	33	11	11	44	21	33
Mean		2.73333081	2.5155982	2.4824325	2.5714328	2.5358855	3.10053525	2.1904397	2.1886272
Median		2.75301562	2.5699270	2.5568848	2.6253125	2.6095734	3.16286299	2.2134182	2.2576719
Mode		3.043362	2.269513[a]	2.053078	2.305351[a]	2.222716[a]	.477121[a]	2.021189	1.913814[a]
Std. Deviation		.443945261	.44699938	.44818711	.44795310	.42451052	.477302610	.41873349	.41987542
Variance		.197	.200	.201	.201	.180	.228	.175	.176
Skewness		-1.749	-1.875	-2.196	-2.231	-1.946	-2.393	-1.607	-2.001
Std. Error of Skewness		.246	.214	.225	.206	.206	.236	.214	.225
Kurtosis		6.879	7.247	9.762	10.468	8.031	10.820	6.855	9.023
Std. Error of Kurtosis		.488	.425	.446	.410	.410	.467	.425	.446
Range		3.085576	3.181272	3.491362	3.551328	3.179695	3.627263	3.192289	3.182129
Minimum		.698970	.301030	.000000	.000000	.301030	.477121	.000000	.000000
Maximum		3.784546	3.482302	3.491362	3.551328	3.480725	4.104385	3.192289	3.182129

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - County level

Statistics

		logT15fd	logT16fd	logT2003fd	logT17d	logT18d	logT19d	logT20d	logT2004d
N	Valid	138	138	100	132	134	148	149	125
	Missing	11	11	49	17	15	1	0	24
Mean		2.2416704	2.1836380	2.76172830	2.5637227	2.5154578	2.5432423	2.4934003	3.12672798
Median		2.2988476	2.2227087	2.82768641	2.6169991	2.5814942	2.5932733	2.5611014	3.18155777
Mode		1.944483	1.799341[a]	2.571709	2.439333	2.230449[a]	2.093422[a]	2.611723	1.544068[a]
Std. Deviation		.41355382	.40504827	.468322519	.36704727	.42519904	.40862769	.42090476	.377152402
Variance		.171	.164	.219	.135	.181	.167	.177	.142
Skewness		-1.892	-1.770	-2.658	-1.219	-1.836	-1.804	-1.965	-1.245
Std. Error of Skewness		.206	.206	.241	.211	.209	.199	.199	.217
Kurtosis		8.615	7.551	13.658	3.957	6.370	7.178	7.653	4.136
Std. Error of Kurtosis		.410	.410	.478	.419	.416	.396	.395	.430
Range		3.203577	3.087426	3.770557	2.522607	3.001301	3.164650	3.109410	2.503830
Minimum		.000000	.000000	.000000	.903090	.477121	.301030	.301030	1.544068
Maximum		3.203577	3.087426	3.770557	3.425697	3.478422	3.465680	3.410440	4.047898

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - County level

Statistics

		logT17fd	logT18fd	logT19fd	logT20fd	logT2004fd
N	Valid	133	134	148	149	126
	Missing	16	15	1	0	23
Mean		2.2347594	2.1888523	2.2104125	2.1586546	2.78880957
Median		2.2718416	2.2455127	2.2659565	2.2148438	2.84725873
Mode		2.000000	2.167317[a]	2.110590[a]	1.991226[a]	2.409933[a]
Std. Deviation		.33270162	.38420312	.38016427	.41072427	.345198675
Variance		.111	.148	.145	.169	.119
Skewness		-.843	-1.484	-1.421	-1.877	-.997
Std. Error of Skewness		.210	.209	.199	.199	.216
Kurtosis		2.432	4.452	4.797	7.124	2.880
Std. Error of Kurtosis		.417	.416	.396	.395	.428
Range		2.244454	2.639818	2.863025	3.094471	2.338871
Minimum		.845098	.477121	.301030	.000000	1.380211
Maximum		3.089552	3.116940	3.164055	3.094471	3.719083

a. Multiple modes exist. The smallest value is shown

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - PCT level

Statistics

		logT2d	logT4d	logT1fd	logT2fd	logT4fd	logT5d	logT6d	logT7d
N	Valid	178	183	182	179	183	182	174	179
	Missing	21	16	17	20	16	17	25	20
Mean		2.1856368	2.1949887	1.9261640	1.8605835	1.8803819	2.2493700	2.2154584	2.2609274
Median		2.1687895	2.1673173	1.9164460	1.8260748	1.8692317	2.2540628	2.1986484	2.2624511
Mode		1.869232[a]	1.447158[a]	1.690196	1.602060[a]	1.568202	1.845098	1.491362[a]	1.672098[a]
Std. Deviation		.41294280	.40998177	.42765738	.40512347	.38708712	.41100219	.40951067	.42426990
Variance		.171	.168	.183	.164	.150	.169	.168	.180
Skewness		.060	.033	-.516	.003	.054	-.119	-.040	-.075
Std. Error of Skewness		.182	.180	.180	.182	.180	.180	.184	.182
Kurtosis		.159	.405	2.222	.668	.520	.725	.313	.382
Std. Error of Kurtosis		.362	.357	.358	.361	.357	.358	.366	.361
Range		2.389971	2.665737	3.184407	2.544688	2.435844	2.806316	2.570689	2.805229
Minimum		1.041393	.778151	.000000	.602060	.698970	.698970	.903090	.698970
Maximum		3.431364	3.443889	3.184407	3.146748	3.134814	3.505286	3.473779	3.504199

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - PCT level

Statistics

		logT8d	logT2001d	logT5fd	logT6fd	logT7fd	logT8fd	logT2001fd	logT9d
N	Valid	184	159	183	173	179	184	157	179
	Missing	15	40	16	26	20	15	42	20
Mean		2.2131703	2.83822198	1.9353124	1.9071052	1.9401932	1.8980437	2.52178776	2.2380138
Median		2.1832488	2.81291336	1.9190781	1.8864907	1.9030900	1.8864907	2.49136169	2.2174839
Mode		1.602060[a]	2.049218[a]	1.690196	1.591065	1.591065[a]	1.778151	2.190332	1.579784
Std. Deviation		.40992665	.405082867	.40217714	.39402356	.39335837	.39482336	.395743612	.41582895
Variance		.168	.164	.162	.155	.155	.156	.157	.173
Skewness		.106	.011	-.077	-.139	.087	.077	.010	-.014
Std. Error of Skewness		.179	.192	.180	.185	.182	.179	.194	.182
Kurtosis		-.169	.489	.670	.634	.619	.302	.531	.004
Std. Error of Kurtosis		.356	.383	.357	.367	.361	.356	.385	.361
Range		2.350099	2.642005	2.707286	2.485437	2.594945	2.342752	2.473487	2.377558
Minimum		1.113943	1.447158	.477121	.698970	.602060	.778151	1.301030	1.113943
Maximum		3.464042	4.089163	3.184407	3.184407	3.197005	3.120903	3.774517	3.491502

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - PCT level

Statistics

		logT10d	logT11d	logT12d	logT2002d	logT9fd	logT10fd	logT11fd	logT12fd
N	Valid	182	174	182	152	179	182	174	182
	Missing	17	25	17	47	20	17	25	17
Mean		2.2412824	2.2671128	2.2545472	2.85159878	1.9187474	1.9185398	1.9473835	1.9331875
Median		2.2291678	2.2380171	2.2430097	2.80753292	1.9030900	1.8948608	1.9216787	1.9267883
Mode		1.716003	1.963788[a]	1.748188	2.252853[a]	1.505150[a]	1.591065[a]	1.740363	1.653213[a]
Std. Deviation		.41572020	.40755949	.38708848	.404434732	.38064017	.39759551	.38818262	.36304064
Variance		.173	.166	.150	.164	.145	.158	.151	.132
Skewness		-.034	.072	.037	.292	.187	-.018	.218	.108
Std. Error of Skewness		.180	.184	.180	.197	.182	.180	.184	.180
Kurtosis		.183	.619	.984	-.025	.422	.639	.795	1.007
Std. Error of Kurtosis		.358	.366	.358	.391	.361	.358	.366	.358
Range		2.534731	2.687911	2.695044	2.196107	2.411900	2.603686	2.519566	2.409257
Minimum		.954243	.845098	.778151	1.903090	.778151	.602060	.698970	.698970
Maximum		3.488974	3.533009	3.473195	4.099197	3.190051	3.205746	3.218536	3.108227

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - PCT level

Statistics

		logT2002fd	logT13d	logT14d	logT15d	logT16d	logT2003d	logT13fd	logT14fd
N	Valid	150	185	173	192	191	161	185	173
	Missing	49	14	26	7	8	38	14	26
Mean		2.52036236	2.2794513	2.2708119	2.3156203	2.2837919	2.87270082	1.9672536	1.9757754
Median		2.50718045	2.2764618	2.2695129	2.3053514	2.2624511	2.82216808	1.9731279	1.9637878
Mode		3.043362	1.838849[a]	1.919078[a]	1.623249[a]	2.222716	2.247973[a]	1.579784[a]	1.778151[a]
Std. Deviation		.396075305	.40003426	.38791260	.40187256	.39273950	.386883714	.37149011	.36521332
Variance		.157	.160	.150	.162	.154	.150	.138	.133
Skewness		-.034	-.182	-.002	.136	.159	.070	-.092	.161
Std. Error of Skewness		.198	.179	.185	.175	.176	.191	.179	.185
Kurtosis		1.695	1.256	.541	.464	.074	.682	1.451	.829
Std. Error of Kurtosis		.394	.355	.367	.349	.350	.380	.355	.367
Range		2.881456	2.704151	2.491362	2.509935	2.304634	2.441627	2.590229	2.182129
Minimum		.903090	.778151	1.000000	1.041393	1.176091	1.662758	.602060	1.000000
Maximum		3.784546	3.482302	3.491362	3.551328	3.480725	4.104385	3.192289	3.182129

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - PCT level

Statistics

		logT15fd	logT16fd	logT2003fd	logT17d	logT18d	logT19d	logT20d	logT2004d
N	Valid	192	191	159	187	189	198	199	183
	Missing	7	8	40	12	10	1	0	16
Mean		1.9933234	1.9491416	2.55782326	2.3047901	2.2538760	2.2763393	2.2219434	2.86972281
Median		1.9776995	1.9344985	2.55870857	2.2855573	2.2304489	2.2491139	2.2148438	2.86687781
Mode		1.799341	1.623249[a]	2.426511[a]	2.136721	1.556303	2.107210	1.845098[a]	2.376577[a]
Std. Deviation		.36946540	.36419017	.362874092	.39925706	.42692607	.39868397	.41262235	.405935442
Variance		.137	.133	.132	.159	.182	.159	.170	.165
Skewness		.255	.243	.239	.137	-.055	.035	-.047	.041
Std. Error of Skewness		.175	.176	.192	.178	.177	.173	.172	.180
Kurtosis		.627	.248	.889	-.169	.055	.226	.112	.103
Std. Error of Kurtosis		.349	.350	.383	.354	.352	.344	.343	.357
Range		2.300487	2.008245	2.265407	2.249606	2.633324	2.562590	2.507350	2.503830
Minimum		.903090	1.079181	1.505150	1.176091	.845098	.903090	.903090	1.544068
Maximum		3.203577	3.087426	3.770557	3.425697	3.478422	3.465680	3.410440	4.047898

Figure 9 - Univariate analysis - distribution statistics for transformed outcome variables - PCT level

Statistics

		logT17fd	logT18fd	logT19fd	logT20fd	logT2004fd
N	Valid	188	189	198	199	182
	Missing	11	10	1	0	17
Mean		1.9914442	1.9480671	1.9669850	1.9079255	2.55476376
Median		1.9842415	1.9590414	1.9444827	1.8864907	2.54406095
Mode		1.505150[a]	1.380211	1.491362[a]	1.672098[a]	2.326336[a]
Std. Deviation		.35934528	.38785009	.35484116	.37801302	.361495234
Variance		.129	.150	.126	.143	.131
Skewness		.224	.026	.078	.065	.163
Std. Error of Skewness		.177	.177	.173	.172	.180
Kurtosis		-.008	-.091	.362	.009	.161
Std. Error of Kurtosis		.353	.352	.344	.343	.358
Range		1.913461	2.271842	2.318957	2.249373	2.187604
Minimum		1.176091	.845098	.845098	.845098	1.531479
Maximum		3.089552	3.116940	3.164055	3.094471	3.719083

a. Multiple modes exist. The smallest value is shown

Figure 10 - Summary results of Cronbach's Alpha test of reliability for all variables at all levels

Grouping	Cases	Number of items	Cronbach's Alpha	Cronbach's Alpha based on standardised items
Local Authority level	**353**			
All homeless decisions for 2000/1	298	5	0.951	0.987
All homeless decisions for 2001/2	286	10	0.909	0.995
All homeless decisions for 2002/3	284	10	0.908	0.995
All homeless decisions for 2003/4	288	10	0.911	0.996
All homeless decisions for 2004/5	323	10	0.901	0.993
General variables	353	5	0.71	0.699
Sexage variables	352	8	0.299	0.986
Housing variables	353	3	0.939	0.957
Ethnicity variables (including white)	353	5	0.569	0.916
Ethnicity variables (excluding white)	353	4	0.804	0.947
Leaving prison variables (deinst15 to 18)	353	4	0.908	0.929
Relationship breakdown variables	353	5	0.864	0.949
Poverty variables	353	6	0.809	0.975
Migration variables	353	3	0.07	0.579
County level	**149**			
All homeless decisions for 2000/1	108	5	0.948	0.983
All homeless decisions for 2001/2	98	10	0.909	0.994
All homeless decisions for 2002/3	96	10	0.908	0.994
All homeless decisions for 2003/4	100	10	0.911	0.995
All homeless decisions for 2004/5	121	10	0.898	0.99
Leaving Social Services care variables (deinst2 to 10)	132	9	0.684	0.997
Leaving Mental Health care variables (deinst11 to 14)	101	4	0.911	0.941
Housing variables	148	6	0.919	0.988
Drug variables	148	6	0.659	0.835
Total annual decisions on homelessness	67	4	0.988	0.989
Total annual full duty decisions on homelessness	64	4	0.984	0.986
PCT level	**199**			
All homeless decisions for 2000/1	162	5	0.949	0.986
All homeless decisions for 2001/2	154	10	0.909	0.995
All homeless decisions for 2002/3	149	10	0.908	0.995
All homeless decisions for 2003/4	159	10	0.911	0.996
All homeless decisions for 2004/5	180	10	0.9	0.992
Poor health variables	199	2	0.936	0.937
Total annual decisions on homelessness	109	4	0.987	0.989
Total annual full duty decisions on homelessness	112	4	0.991	0.991

Figure 11 - Univariate analysis - distribution statistics for general variables at Local Authority level

Statistics

		size in hectares	Total Population	males
N	Valid	353	353	353
	Missing	0	0	0
Mean		36905.88	139858.96	68088.91
Std. Error of Mean		2091.563	4969.650	2405.545
Median		23009.00	112342.00	54879.00
Mode		7978[a]	150969	73805
Std. Deviation		39296.898	93371.251	45196.094
Variance		2E+009	8718190593	2E+009
Skewness		1.975	3.511	3.500
Std. Error of Skewness		.130	.130	.130
Kurtosis		5.266	22.481	22.406
Std. Error of Kurtosis		.259	.259	.259
Range		239555	974934	472194
Minimum		1213	2153	1072
Maximum		240768	977087	473266

Statistics

		females	2001 density (number of people per hectare)
N	Valid	353	353
	Missing	0	0
Mean		71770.07	14.0118
Std. Error of Mean		2565.178	1.06993
Median		57509.00	4.9900
Mode		70161[a]	1.02[a]
Std. Deviation		48195.324	20.10218
Variance		2E+009	404.097
Skewness		3.518	2.762
Std. Error of Skewness		.130	.130
Kurtosis		22.517	9.356
Std. Error of Kurtosis		.259	.259
Range		502740	130.79
Minimum		1081	.23
Maximum		503821	131.02

a. Multiple modes exist. The smallest value is shown

Figure 12 - Univariate analysis - Frequency data for general variable 5 - Local Authority level

Statistics

Council type

N	Valid	353
	Missing	0

Council type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Borough	97	27.5	27.5	27.5
	District	128	36.3	36.3	63.7
	Unitary	46	13.0	13.0	76.8
	City	22	6.2	6.2	83.0
	ILB	13	3.7	3.7	86.7
	OLB	19	5.4	5.4	92.1
	Met Borough	28	7.9	7.9	100.0
	Total	353	100.0	100.0	

Council type

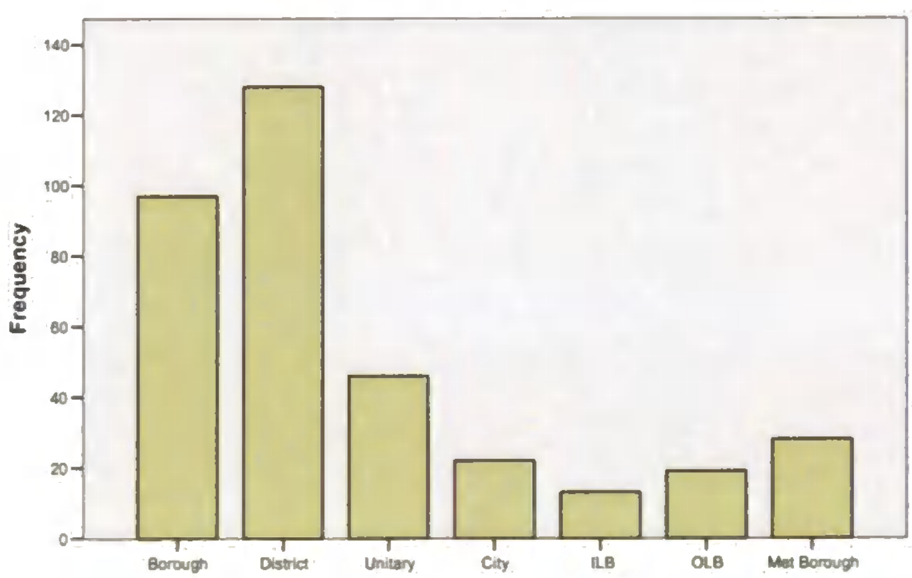


Figure 13 - Univariate analysis - distribution statistics for housing variables - Local Authority level

Statistics

		average social housing rent 2002	social housing rent 1 bed 2002	social housing rent 3 bed 2002
N	Valid	353	353	353
	Missing	0	0	0
Mean		60.99	57.22	65.83
Median		59.89	56.86	63.72
Mode		53[a]	54	61
Std. Deviation		7.880	6.509	10.449
Variance		62.102	42.373	109.172
Skewness		.039	-.118	.214
Std. Error of Skewness		.130	.130	.130
Kurtosis		-.550	.429	-.646
Std. Error of Kurtosis		.259	.259	.259
Range		40	41	48
Minimum		40	38	42
Maximum		80	79	90

a. Multiple modes exist. The smallest value is shown

Figure 13 - Univariate analysis - distribution statistics for housing variables - County level

Statistics

		semi-detached property price 2000	semi-detached property price 2001	flat property price 2000	flat property price 2001	average residential property price 2000	average residential property price 2001
N	Valid	148	148	148	148	148	148
	Missing	1	1	1	1	1	1
Mean		126263.92	141274.11	77165.12	85532.03	107018.85	118328.34
Median		76708.00	87234.00	63257.50	68063.00	84141.00	97812.50
Mode		64990	74166	69760	68063	64168	69358
Std. Deviation		154534.813	198928.726	49804.903	54192.859	68354.653	71672.372
Variance		23881008496	39572638220	2480528403	2936865961	4672358615	5136928839
Skewness		5.401	7.130	3.214	3.093	3.045	2.709
Std. Error of Skewness		.199	.199	.199	.199	.199	.199
Kurtosis		35.584	63.623	13.873	13.446	14.055	11.506
Std. Error of Kurtosis		.396	.396	.396	.396	.396	.396
Minimum		41153	44452	27782	25818	38251	41137
Maximum		1352477	2081752	379592	423790	553782	567952

Figure14 - Univariate analysis - distribution statistics for poor health variables - Local Authority level

Statistics

number of people with limiting long term illness

N	Valid	353
	Missing	0
Mean		25083.61
Median		19418.56
Mode		278[a]
Std. Deviation		18730.773
Variance		4E+008
Skewness		3.576
Std. Error of Skewness		.130
Kurtosis		21.781
Std. Error of Kurtosis		.259
Range		191720
Minimum		278
Maximum		191998

a. Multiple modes exist. The smallest value is shown

Figure 14 - Univariate analysis - distribution statistics for poor health variables - PCT level

Statistics

		mental illness admissions 04/2002 - 03/2003	mental illness discharges 04/2002 - 03/2003
N	Valid	199	199
	Missing	0	0
Mean		659.48	745.33
Median		565.00	570.00
Mode		435	295[a]
Std. Deviation		515.305	548.218
Variance		265539.251	300543.201
Skewness		4.763	2.688
Std. Error of Skewness		.172	.172
Kurtosis		38.092	11.705
Std. Error of Kurtosis		.343	.343
Range		5415	4230
Minimum		15	65
Maximum		5430	4295

a. Multiple modes exist. The smallest value is shown

Figure 15 - Univariate analysis - distribution statistics for ethnicity variables - Local Authority level

Statistics

		white population	mixed race population	asian population	black population	total non-white population
N	Valid	353	353	353	353	353
	Missing	0	0	0	0	0
Mean		127226.29	1817.23	6301.13	3199.60	12632.66
Median		108764.66	851.33	895.58	323.14	2653.49
Mode		2141[a]	12[a]	0[a]	0[a]	12[a]
Std. Deviation		76379.953	2740.112	16228.639	9581.277	27572.117
Variance		5.83E+009	7508212.9	263368729	91800878	760221647
Skewness		3.044	4.044	6.044	4.618	4.738
Std. Error of Skewness		.130	.130	.130	.130	.130
Kurtosis		15.593	26.077	52.627	22.804	33.189
Std. Error of Kurtosis		.259	.259	.259	.259	.259
Range		685240	28030	190727	68565	289694
Minimum		2141	12	0	0	12
Maximum		687381	28042	190727	68565	289706

a. Multiple modes exist. The smallest value is shown

Figure 16 - Univariate analysis - distribution statistics for poverty variables - Local Authority level

Statistics

		Total income support claimants-08/2000	Total income support claimants 08/2001	IB JSA claimants 08/2000	IB JSA claimants 08/2001	no.of unemployed people 16-74 who have never worked or are LT unemployed	no.of people 16-74 economically inactive
N	Valid	353	353	353	353	353	353
	Missing	0	0	0	0	0	0
Mean		8982.20	9271.01	1853.43	1758.88	1365.42	33381.52
Median		5460.00	5715.00	930.00	790.00	687.01	25337.49
Mode		2175[a]	3895[a]	280[a]	275[a]	3[a]	325[a]
Std. Deviation		9758.673	9985.229	2664.380	3361.214	1846.300	25382.154
Variance		95231700.493	99704799.51	7098919.0	11297763	3408822.800	644253750.8
Skewness		4.021	4.070	4.779	8.319	4.747	3.827
Std. Error of Skewness		.130	.130	.130	.130	.130	.130
Kurtosis		26.776	27.471	38.086	97.050	35.672	25.302
Std. Error of Kurtosis		.259	.259	.259	.259	.259	.259
Range		100840	103990	29950	46445	20084	269182
Minimum		30	35	0	0	3	325
Maximum		100870	104025	29950	46445	20087	269507

a. Multiple modes exist. The smallest value is shown

Figure 17 - Univariate analysis - distribution statistics for relationship variables - Local Authority level

Statistics

		seperated but still legally married	divorced	widowed	Total relationship breakdown	number of population with no religion
N	Valid	353	353	353	353	353
	Missing	0	0	0	0	0
Mean		2667.71	9496.92	9231.82	21396.44	20377.48
Median		1990.00	7471.00	7619.00	16925.00	16727.07
Mode		1235[a]	3862[a]	5180[a]	10614[a]	434[a]
Std. Deviation		2104.247	9422.646	6186.507	15963.024	14854.684
Variance		4427854.763	9E+007	4E+007	254818145.2	220661635
Skewness		3.588	9.682	3.571	4.376	2.981
Std. Error of Skewness		.130	.130	.130	.130	.130
Kurtosis		23.206	133.553	22.014	30.565	14.117
Std. Error of Kurtosis		.259	.259	.259	.259	.259
Range		22016	147649	63755	167615	121116
Minimum		36	114	138	288	434
Maximum		22052	147763	63893	167903	121550

a. Multiple modes exist. The smallest value is shown

Figure 18 - Univariate analysis - distribution statistics for sexage variables Local Authority level

Statistics

		Number of 16 & 17yr olds in population	number of people with no qualifications	number of under 18 conception s1998-00	number of under 18 conceptions 2001-03	income support claimants under 20 08/2000	income support claimants under 20 08/2001	IB JSA caimants under 20 08/2000	IB JSA claimants under 20 08/2001
N	Valid	353	353	352	352	353	353	353	353
	Missing	0	0	1	1	0	0	0	0
Mean		3503.43	29042.68	338.17	333.42	227.48	199.72	212.71	192.22
Median		2794.13	22739.00	232.50	220.00	125.00	125.00	105.00	90.00
Mode		27[a]	300[a]	104[a]	75[a]	55	65	65	80
Std. Deviation		2463.914	23301.743	326.839	323.757	308.318	228.073	309.183	280.541
Variance		6070872.415	542971234.2	106823.777	104818.672	95059.818	52017.249	95593.867	78703.066
Skewness		3.903	4.020	3.679	3.384	4.027	3.780	5.111	4.869
Std. Error of Skewness		.130	.130	.130	.130	.130	.130	.130	.130
Kurtosis		27.931	27.562	24.360	20.513	20.635	23.266	42.217	38.538
Std. Error of Kurtosis		.259	.259	.259	.259	.259	.259	.259	.259
Range		27332	251909	3380	3222	2285	2270	3530	3125
Minimum		27	300	40	33	0	0	0	0
Maximum		27358	252209	3420	3255	2285	2270	3530	3125

a. Multiple modes exist. The smallest value is shown

Figure 19 - Univariate analysis - distribution statistics for drug variables - County level

Statistics

		number of people using heroin as main drug in contact with DTA 2003/4	number of people using methadone as main drug in contact with DTA 2003/4	number of people using amphetamine as main drug in contact with DTA 2003/4	number of people using crack as main drug in contact with DTA 2003/2004	number of people using cannabis as main drug in contact with DTA 2003/4	Total number in contact (using any drug) with DTA in 2003/4
N	Valid	148	148	148	148	148	148
	Missing	1	1	1	1	1	1
Mean		535.47	39.97	25.09	42.74	65.47	837.03
Median		408.00	16.50	15.00	19.50	46.00	658.50
Mode		115[a]	3	3	3	3	510[a]
Std. Deviation		481.621	64.984	27.137	64.729	63.241	663.876
Variance		231959.012	4222.870	736.434	4189.855	3999.448	440731.312
Skewness		2.717	3.793	1.800	2.871	1.853	2.242
Std. Error of Skewness		.199	.199	.199	.199	.199	.199
Kurtosis		10.093	19.676	3.172	9.817	4.365	6.380
Std. Error of Kurtosis		.396	.396	.396	.396	.396	.396
Minimum		10	0	0	0	0	12
Maximum		3264	506	131	407	375	3987

a. Multiple modes exist. The smallest value is shown

Figure 20 - Univariate analysis - distribution statistics for leaving social services care variables - County level

Statistics

		children in need receiving services 2000	children in need receiving services 2001	children ceasing to be looked after 2000	children ceasing to be looked after 2001	young people who ceased to be looked after during year ending 31/03/2000	young people who ceased to be looked after during year ending 31/03/2001	young people who ceased to be looked after during year ending 31/03/2002	young people who ceased to be looked after during year ending 31/03/2003	young people who ceased to be looked after during year ending 31/03/2004
N	Valid	144	143	146	146	145	149	149	149	148
	Missing	5	6	3	3	4	0	0	0	1
Mean		1483.23	1500.24	183.90	172.57	43.77	44.70	44.35	45.11	46.05
Median		1344.50	1235.00	150.00	140.00	35.00	35.00	35.00	40.00	40.00
Mode		846[a]	1410	70	100	20	30[a]	20[a]	25[a]	20
Std. Deviation		779.404	923.439	129.438	117.799	30.062	31.070	31.052	31.754	32.792
Variance		607470.542	852740.257	16754.308	13876.633	903.750	965.372	964.202	1008.345	1075.317
Skewness		.662	1.447	2.249	2.390	1.760	1.928	1.937	2.050	2.183
Std. Error of Skewness		.202	.203	.201	.201	.201	.199	.199	.199	.199
Kurtosis		-.114	1.948	6.717	8.589	4.062	4.388	5.083	6.575	7.088
Std. Error of Kurtosis		.401	.403	.399	.399	.400	.395	.395	.395	.396
Minimum		2	105	35	20	0	0	0	0	0
Maximum		3935	4815	810	820	180	175	195	215	220

a. Multiple modes exist. The smallest value is shown

Figure 21 - Univariate analysis - distribution statistics for leaving prison variables - Local Authority level

Statistics

		violence against the person offences 04/2000 - 03/2001	burglary from a dwelling offences 04/2000 - 03/2001	theft of a motor vehicle offences 04/2000 - 03/2001	theft from a motor vehicle offences 04/2000 - 03/2001
N	Valid	353	353	353	353
	Missing	0	0	0	0
Mean		1589.62	1190.22	907.86	1708.32
Median		857.00	555.00	425.00	1033.00
Mode		470	233[a]	111[a]	317[a]
Std. Deviation		1970.823	2270.533	1297.865	1928.568
Variance		3884142.9	5155321.992	1684453.228	3719373.365
Skewness		3.661	8.779	4.093	3.711
Std. Error of Skewness		.130	.130	.130	.130
Kurtosis		22.775	107.613	24.169	20.757
Std. Error of Kurtosis		.259	.259	.259	.259
Range		19844	32497	12018	17071
Minimum		10	2	3	4
Maximum		19854	32499	12021	17075

a. Multiple modes exist. The smallest value is shown

Figure 22 - Univariate analysis - distribution statistics for leaving mental health care variables - County level

Statistics

		guardianship under MHA83 - cases closed during year -31/03/2000	guardianship under MHA83 - cases open as at -31/03/2000	guardianship under MHA83 - cases closed during year -31/03/2001	guardianship under MHA83 - cases open as at -31/03/2001
N	Valid	149	149	108	132
	Missing	0	0	41	17
Mean		3.56	6.96	4.81	7.84
Median		2.00	4.00	3.00	5.00
Mode		0	0	1	1
Std. Deviation		5.076	8.559	4.894	9.789
Variance		25.762	73.255	23.952	95.829
Skewness		2.383	2.476	2.290	2.704
Std. Error of Skewness		.199	.199	.233	.211
Kurtosis		6.828	8.218	6.212	8.269
Std. Error of Kurtosis		.395	.395	.461	.419
Minimum		0	0	1	1
Maximum		30	56	29	54

Figure 23 - Univariate analysis - distribution statistics for leaving armed forces variable - Local Authority level

Statistics

number of people in the armed forces

N	Valid	353
	Missing	0
Mean		442.38
Median		150.00
Mode		39[a]
Std. Deviation		743.428
Variance		552684.7
Skewness		3.186
Std. Error of Skewness		.130
Kurtosis		11.200
Std. Error of Kurtosis		.259
Range		4643
Minimum		0
Maximum		4643

a. Multiple modes exist. The smallest value is shown

Figure 24 - Univariate analysis - distribution statistics for migration variables - Local Authority level

Statistics

		% intercensal population change (1991 - 2001)	Lived elsewhere within the associated area	lived elsewhere outside associated area but within the UK
N	Valid	353	353	353
	Missing	0	0	0
Mean		5.2099	6111.74	150.40
Median		5.1900	4974.00	108.00
Mode		2.82[a]	3010[a]	54[a]
Std. Deviation		4.99526	4171.013	137.678
Variance		24.953	17397352.4	18955.149
Skewness		.414	2.246	2.760
Std. Error of Skewness		.130	.130	.130
Kurtosis		.213	6.507	11.283
Std. Error of Kurtosis		.259	.259	.259
Range		27.67	26812	1049
Minimum		-5.56	168	3
Maximum		22.11	26980	1052

a. Multiple modes exist. The smallest value is shown

Figure 25 - Scatterplot summary

	Local Authority level																																							
Variables	gen 1	gen2	gen3	gen4	migration1	migration2	migration3	deinst1	sexage1	sexage2	sexage3	sexage4	sexage5	sexage6	sexage7	sexage8	housing1	housing2	housing3	ethnicity1	ethnicity2	ethnicity3	ethnicity4	ethnicity5	deinst15	deinst16	deinst17	deinst18	relationship	relationship	relationship	relationship	relationship	poverty1	poverty2	poverty3	poverty4	poverty5	poverty6	poorhealth1
2000 2nd quarter T2d	x	√	√	√	x	√	x	x	√	x	√	√	x	x	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√	√	√	√	√	x
2000 4th quarter T4d	x	√	√	√	x	√	√	x	√	x	√	√	√o	x	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	√	√	√	√	√	√	√	√	x
2000 1st quarter T1fd	x	√	√	√	x	√	x	x	√	x	√	√	x	x	x	x	x	x	x	x	√	x	x	x	√	x	√	√	√	x	x	x	√	√	√	√	√o	√	√	x
2000 2nd quarter T2fd	x	√	√	√	x	√	x	x	√	x	√	√	x	√	√	√	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√	√	√	√	√	x
2000 4th quarter T4fd	x	√	√	√	x	√	x	x	√	x	√	√	√o	x	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√	√	√	√o	√	x
2001 1st quarter T5d	x	√	√	√	x	√	x	x	√	x	√	√	√o	x	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√	√	√o	√o	√	x
2001 2nd quarter T6d	x	√	√	√	x	√	x	x	√	x	√	x	√o	x	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	√o	√	√	√	√	√	√o	√	x
2001 3rd quarter T7d	x	√	√	√	x	√	x	x	x	x	√	√	x	x	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√o	√	√o	√o	√	x
2001 4th quarter T8d	x	√	√	√	x	√	x	x	x	x	√	√	√o	x	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√o	√	√o	√o	√	√
homeless decisions 2001	x	√	√	√	x	√	x	x	√	√	√	√	√o	√	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	√o	√o	√	√	√	√	√	√o	√	√
2001 1st quarter T5fd	x	x	√	√	x	√	x	x	√	x	√	√	√o	x	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√	√	√o	√o	√	x
2001 2nd quarter T6fd	x	√	√	√	x	√	x	x	√	√	√	√	√o	√	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√	√	√	√o	√	√
2001 3rd quarter T7fd	x	x	√	√	x	√	x	x	√	√	√	√	x	x	√	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√	√	√o	√o	√o	x
2001 4th quarter T8fd	x	√	√	√	x	√	x	x	√	x	√o	√	x	√	x	x	x	x	x	x	√	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√o	√o	√	√o	√o	√	x
full duty accepted 2001	x	√	√	√	x	√	x	x	√	√	√	√	x	√	√o	x	x	x	x	x	√	x	x	√	√	√o	√	√	√	√o	x	x	√	√	√	√	√	√o	√	x
2002 1st quarter T9d	x	√	√	√	x	√	x	x	√	x	√	√	x	√	√o	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	√	√o	√	√	√	√	√o	√o	√	x
2002 2nd quarter T10d	x	√	√	√	x	√	x	x	√	√o	√	√	√o	√	x	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	√	√o	√	√	√	√	√o	√o	√	√
2002 3rd quarter T11d	x	√	√	√	x	√	x	x	√	√	√	√	x	√	√o	x	x	x	x	x	√	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√	√	√	√o	√o	√	√
2002 4th quarter T12d	x	√	√	√	x	√	x	x	√	√o	√	√	x	√	√o	x	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	√	√o	√	√	√	√	√o	√	√	√
homeless decsions 2002	x	√	√	√	x	√	x	x	√	√	√	√	x	√	√o	√o	x	x	x	x	√	x	x	x	√o	√o	√	√	√	√o	√	√o	√	√	√	√	√o	√o	√	√
2002 1st quarter T9fd	x	√	√	√	x	√	x	x	√	x	√	√	x	√	√	√o	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	x	√	√	√	√	√o	√o	√	x
2002 2nd quarter T10fd	x	√	√	√	x	√	x	x	√	√	√	√	x	√	x	√	x	x	x	x	√	x	x	x	√	√o	√	√	√	√o	x	√o	√	√	√	√	√o	√o	√	√
2002 3rd quarter T11fd	x	√	√	√	x	√	x	x	√	√	√	√	x	√	√o	√o	x	x	x	x	√	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√	√	√	√o	√o	√	√
2002 4th quarter T12fd	x	√	√	√	x	√	x	x	√	√	√	√	x	√	√	√o	x	x	x	x	√	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√	√	√	√o	√o	√	√
full duty accepted 2002	x	√	√	√	x	√	x	x	√	√	√	√	x	√	√o	√o	x	x	x	x	√	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√	√	√	√o	√o	√	√
2003 1st quarter T13d	x	√	√	√	x	√	x	x	√	x	√	√	x	x	x	x	x	x	x	x	√	x	x	x	√o	√o	√o	√	√	√o	x	√o	√	√	√	√	√o	√o	√	x
2003 2nd quarter T14d	x	√	√	√	x	√	x	x	√	x	√	√	x	x	x	x	x	x	x	x	√	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√	√	√	√	x	√	√

Figure 25 - Scatterplot summary

Variables	Local Authority level																
	gen 1	gen2	gen3	gen4	migration1	migration2	migration3	deinst1	sexage1	sexage2	sexage3	sexage4	sexage5	sexage6	sexage7	sexage8	housing1
2003 3rd quarter T15d	x	√	√	√	x	√	x	x	√	x	√	√	x	x	x	x	x
2003 4th quarter T16d	x	√	√	√	x	√	x	x	√	√o	√o	√o	x	√o	x	x	x
homeless decisions 2003	x	√	√	√	x	√	x	x	√	√o	√	√	x	x	x	x	x
2003 1st quarter T13fd	x	√	√	√	x	√	x	x	√	√o	√	√	x	x	x	x	x
2003 2nd quarter T14fd	x	√	√	√	x	√	x	x	√	√o	√	√	x	x	x	x	x
2003 3rd quarter T15fd	x	√	√	√	x	√	x	x	√o	√o	√	√	x	x	x	x	x
2003 4th quarter T16fd	x	√	√	√	x	√	x	x	√o	x	√	√	x	x	x	x	x
full duty accepted 2003	x	√	√	√	x	√	x	x	√o	x	√	√	x	√o	x	x	x
2004 1st quarter T17d	x	√	√	√	x	√o	x	x	√o	x	√o	√o	x	√o	x	x	x
2004 2nd quarter T18d	x	√	√	√	x	√o	x	x	√o	√o	√o	√o	x	√o	x	x	x
2004 3rd quarter T19d	x	√	√	√	x	√o	x	x	√o	√o	√o	√o	x	√o	x	x	x
2004 4th quarter T20d	x	√	√	√	x	√o	x	x	√o	x	√o	√o	x	√o	x	x	x
homeless decisions 2004	x	√	√	√	x	√o	x	x	√o	√o	√o	√o	x	√o	x	x	x
2004 1st quarter T17fd	x	√	√	√	x	√o	x	x	√o	√o	√o	√o	x	√o	√o	√o	x
2004 2nd quarter T18fd	x	√o	√	√	x	√o	x	x	√o	x	√o	√o	x	√o	x	x	x
2004 3rd quarter T19fd	x	√	√	√	x	√	x	x	√o	√o	√o	√o	x	√o	x	√o	x
2004 4th quarter T20fd	x	√o	√	√	x	√	x	x	√o	x	√	√	x	√o	x	x	x
full duty accepted 2004	x	√	√	√	x	√	x	x	√o	x	√	√	x	√o	x	x	x

Variables	housing2	housing3	ethnicity1	ethnicity2	ethnicity3	ethnicity4	ethnicity5	deinst15	deinst16	deinst17	deinst18	relationship1	relationship2	relationship3	relationship4	relationship5	poverty1	poverty2	poverty3	poverty4	poverty5	poverty6	poorhealth1
2003 3rd quarter T15d	x	x	x	√o	x	x	x	√o	√o	√o	√o	√	√o	x	√o	√	√o	√o	√o	√o	x	√	x
2003 4th quarter T16d	x	x	x	√o	x	x	x	√o	√o	√o	√o	√	√o	x	√o	√o	√o	√o	√o	√o	√o	√	√o
homeless decisions 2003	x	x	x	√o	x	x	x	√o	√o	√o	√	√	√o	x	√o	√	√o	√o	√o	√	√o	√	x
2003 1st quarter T13fd	x	x	x	√o	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√o	√o	√	√	x	√	x
2003 2nd quarter T14fd	x	x	√	√o	x	x	x	√o	√o	√	√	√	√o	√	√o	√	√o	√o	√o	√	√o	√	√
2003 3rd quarter T15fd	x	x	x	√o	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√o	√o	√	√	√o	√	x
2003 4th quarter T16fd	x	x	x	√o	x	x	x	√o	√o	√	√	√	√o	x	√o	√	√o	√o	√	√o	√o	√	√o
full duty accepted 2003	x	x	x	√o	x	x	x	√o	√o	√o	√	√	√o	x	√o	√	√o	√o	√	√o	√o	√	√o
2004 1st quarter T17d	x	x	x	x	x	x	x	x	√o	√o	√o	√	√o	x	√o	√	√o	√o	√o	√o	√o	√	x
2004 2nd quarter T18d	x	x	x	√o	x	x	x	√o	√o	√o	√	√	√o	√o	√o	√	√o	√o	√	√o	√o	√	√
2004 3rd quarter T19d	x	x	x	√o	x	x	x	√o	√o	√o	√o	√	√o	√o	√o	√	√o	√o	√o	√o	x	√	√o
2004 4th quarter T20d	x	x	x	√o	x	x	x	√o	√o	x	√o	√	√o	x	√o	√o	√o	√o	√o	√o	√o	√	√o
homeless decisions 2004	x	x	x	x	x	x	x	√o	√o	x	√o	√	√o	x	√o	√o	√o	√o	√o	√o	√o	√	√o
2004 1st quarter T17fd	x	x	x	√o	x	x	x	√o	√o	√o	√o	√	√o	x	√o	√o	√o	√o	√	√o	√o	√	√o
2004 2nd quarter T18fd	x	x	x	√o	x	x	x	√o	√o	√o	√	√	√o	x	√o	√	√o	√o	√	√o	√o	√	√o
2004 3rd quarter T19fd	x	x	x	√o	x	x	x	√o	√o	√o	√	√	√o	x	√o	√o	√o	√o	√	√o	√o	√	√o
2004 4th quarter T20fd	x	x	x	√o	x	x	x	√o	√o	√o	√	√	√o	x	x	√o	√o	√o	√	√o	√o	√	x
full duty accepted 2004	x	x	√	√o	x	x	x	√o	√o	√o	√	√	√o	x	√o	√	√o	√o	√	√o	√o	√	√o

Key	
x	No visible relationship
√	visible linear relationship
√o	linear relationship with outliers
	refers to time before date of data

Figure 25 - Scatterplot summary - County and PCT levels

Variables	County level																										PCT level	
	deinst2	deinst3	deinst4	deinst5	deinst6	deinst7	deinst8	deinst9	deinst10	deinst11	deinst12	deinst13	deinst14	housing4	housing5	housing6	housing7	housing8	housing9	drugs1	drugs2	drugs3	drugs4	drugs5	drugs6			poorhealth2	poorhealth3
2000 2nd quarter T2d	√o	√o	√o	√o	√	√	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			√o	x
2000 4th quarter T4d	√o	√o	√o	√o	√	√	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√o	x	x	x	x	√o			√o	√
2000 1st quarter T1fd	√o	√o	√o	√o	√	√	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√o	x	x	x	x	√o			√o	x
2000 2nd quarter T2fd	√o	√	√o	√o	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√o	x	x	x	x	√o			√o	x
2000 4th quarter T4fd	√o	√	√o	√o	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√o	x	x	x	x	√o			√o	x
2001 1st quarter T5d	√	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√o	x	x	x	x	√o			√o	x
2001 2nd quarter T6d	√	√o	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√o	x	x	x	x	√o			√o	x
2001 3rd quarter T7d	√	√o	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√o	x	x	x	x	√o			x	x
2001 4th quarter T8d	√o	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	x
homeless decisions 2001	√o	√o	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	√			√o	√
2001 1st quarter T5fd	√o	√o	√	√o	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√o	x	x	x	x	√o			√o	x
2001 2nd quarter T6fd	√	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	x
2001 3rd quarter T7fd	√	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	√			√o	x
2001 4th quarter T8fd	√	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	x
full duty accepted 2001	√	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√	√o
2002 1st quarter T9d	√	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	√o
2002 2nd quarter T10d	√	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	√o
2002 3rd quarter T11d	√	√o	√	√	√	√	√	√	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	x
2002 4th quarter T12d	√o	√o	√	√	√	√	√	√	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	x
homeless decsions 2002	√o	√	√	√	√	√	√	√	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	√
2002 1st quarter T9fd	√o	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	√
2002 2nd quarter T10fd	√o	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√	x
2002 3rd quarter T11fd	√o	√	√	√	√	√	√	√	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	√
2002 4th quarter T12fd	√o	√	√	√	√	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	x
full duty accepted 2002	√o	√	√	√	√	√	√	√	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√	√
2003 1st quarter T13d	√o	√	√	√	√	√	√	√	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√o	√o
2003 2nd quarter T14d	√o	√	√	√	√	√	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√o			√o	√o
2003 3rd quarter T15d	√o	√	√	√o	√	√	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√			√	√o

Figure 25 - Scatterplot summary - County and PCT levels

	County level																								PCT level	
Variables	deinst2	deinst3	deinst4	deinst5	deinst6	deinst7	deinst8	deinst9	deinst10	deinst11	deinst12	deinst13	deinst14	housing4	housing5	housing6	housing7	housing8	housing9	drugs1	drugs2	drugs3	drugs4	drugs5	drugs6	poorhealth2	poorhealth3
2003 4th quarter T16d	√o	√	√	√o	√	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	√o
homeless decisions 2003	√o	√	√	√o	√	√	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√	√
2003 1st quarter T13fd	√o	√	√	√o	√	√	√	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√	√o
2003 2nd quarter T14fd	√o	√	√	√	√	√	√	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√	√o
2003 3rd quarter T15fd	√o	√	√o	√o	√	√	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	√o
2003 4th quarter T16fd	√o	√o	√	√o	√	√	√	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	√o
full duty accepted 2003	√o	√	√	√	√	√	√	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√	√
2004 1st quarter T17d	√o	√	√	√o	√o	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	√o
2004 2nd quarter T18d	√o	√	√o	√	√o	√o	√o	√o	√	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	√o
2004 3rd quarter T19d	√o	√o	√	√	√o	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	x
2004 4th quarter T20d	√o	√o	√o	√o	√o	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	x
homeless decisions 2004	√o	√o	√o	√o	√o	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	√o
2004 1st quarter T17fd	√o	√	√	√	√o	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	√o
2004 2nd quarter T18fd	√o	√	√	√	√o	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√o	√
2004 3rd quarter T19fd	√o	√	√	√	√o	√o	√o	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√	√
2004 4th quarter T20fd	√o	√o	√	√	√	√	√	√	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√	√
full duty accepted 2004	√o	√	√	√	√	√	√	√o	√o	x	x	x	x	x	x	x	x	x	x	√	x	x	x	x	√	√	√

Key	
x	No visible relationship
√	visible linear relationship
√o	linear relationship with outliers
	refers to time before date of data

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - Local Authority level

Variable		gen2	gen3	gen4	logsexage1	logsexage3	sexage4	logsexage6	logethnicity2
logT2d	Pearson Correlation	0.648	0.646	0.65	0.713	0.757	0.662	0.737	0.703
	N	325	325	325	325	325	325	325	325
logT4d	Pearson Correlation	0.7	0.698	0.701	0.77	0.788	0.69	0.764	0.735
	N	329	329	329	329	329	329	329	329
logT1fd	Pearson Correlation	0.67	0.669	0.671	0.715	0.71	0.66	0.698	0.715
	N	326	326	326	326	326	326	326	326
logT2fd	Pearson Correlation	0.663	0.662	0.664	0.71	0.73	0.672	0.701	0.733
	N	325	325	325	325	325	325	325	325
logT4fd	Pearson Correlation	0.701	0.7	0.702	0.757	0.747	0.684	0.717	0.761
	N	329	329	329	329	329	329	329	329
logT5d	Pearson Correlation	0.7	0.698	0.701	0.766	0.774	0.68	0.756	0.725
	N	326	326	326	326	326	326	326	326
logT6d	Pearson Correlation	0.668	0.667	0.669	0.724	0.781	0.683	0.768	0.718
	N	318	318	318	318	317	317	317	318
logT7d	Pearson Correlation	0.678	0.677	0.678	0.75	0.813	0.699	0.79	0.723
	N	326	326	326	326	326	326	326	326
logT8d	Pearson Correlation	0.672	0.671	0.672	0.725	0.798	0.696	0.781	0.731
	N	332	332	332	332	331	331	331	332
logT2001d	Pearson Correlation	0.714	0.713	0.715	0.785	0.81	0.708	0.791	0.738
	N	291	291	291	291	291	291	291	291
logT5fd	Pearson Correlation	0.687	0.686	0.687	0.736	0.724	0.669	0.705	0.737
	N	327	327	327	327	327	327	327	327
logT6fd	Pearson Correlation	0.67	0.668	0.671	0.717	0.736	0.672	0.726	0.728
	N	317	317	317	317	316	316	316	317
logT7fd	Pearson Correlation	0.681	0.68	0.681	0.751	0.787	0.695	0.761	0.753
	N	326	326	326	326	326	326	326	326
logT8fd	Pearson Correlation	0.664	0.663	0.665	0.701	0.736	0.665	0.714	0.754
	N	332	332	332	332	331	331	331	332
logT2001fd	Pearson Correlation	0.712	0.71	0.712	0.773	0.764	0.699	0.745	0.757
	N	290	290	290	290	290	290	290	290
logT9d	Pearson Correlation	0.673	0.671	0.673	0.712	0.798	0.702	0.79	0.706
	N	328	328	328	328	327	327	327	328
logT10d	Pearson Correlation	0.708	0.707	0.708	0.747	0.823	0.727	0.807	0.73
	N	328	328	328	328	327	327	327	328
logT11d	Pearson Correlation	0.668	0.668	0.668	0.732	0.814	0.709	0.8	0.701
	N	319	319	319	319	318	318	318	319
logT12d	Pearson Correlation	0.674	0.674	0.674	0.728	0.816	0.706	0.8	0.701
	N	330	330	330	330	329	329	329	330
logT2002d	Pearson Correlation	0.685	0.685	0.686	0.74	0.826	0.72	0.812	0.722
	N	287	287	287	287	286	286	286	287
logT9fd	Pearson Correlation	0.675	0.674	0.676	0.716	0.744	0.68	0.738	0.737
	N	328	328	328	328	327	327	327	328
logT10fd	Pearson Correlation	0.724	0.724	0.723	0.749	0.762	0.701	0.746	0.742
	N	328	328	328	328	327	327	327	328
logT11fd	Pearson Correlation	0.687	0.687	0.687	0.736	0.784	0.708	0.768	0.735
	N	319	319	319	319	318	318	318	319
logT12fd	Pearson Correlation	0.682	0.681	0.683	0.727	0.785	0.692	0.762	0.735
	N	330	330	330	330	329	329	329	330
logT2002fd	Pearson Correlation	0.723	0.723	0.724	0.769	0.786	0.717	0.769	0.77
	N	284	284	284	284	283	283	283	284

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - Local Authority level

Variable		gen2	gen3	gen4	logsexage1	logsexage3	sexage4	logsexage6	logethnicity2
logT13d	Pearson Correlation	0.663	0.663	0.663	0.734	0.816	0.704	0.815	0.68
	N	331	331	331	331	330	330	330	331
logT14d	Pearson Correlation	0.68	0.68	0.679	0.759	0.834	0.727	0.823	0.704
	N	312	312	312	312	311	311	311	312
logT15d	Pearson Correlation	0.683	0.682	0.683	0.748	0.828	0.735	0.827	0.687
	N	341	341	341	341	340	340	340	341
logT16d	Pearson Correlation	0.695	0.695	0.696	0.752	0.849	0.748	0.848	0.699
	N	342	342	342	342	341	341	341	342
logT2003d	Pearson Correlation	0.677	0.677	0.677	0.768	0.847	0.728	0.839	0.707
	N	290	290	290	290	289	289	289	290
logT13fd	Pearson Correlation	0.684	0.684	0.684	0.755	0.802	0.705	0.802	0.71
	N	331	331	331	331	330	330	330	331
logT14fd	Pearson Correlation	0.709	0.71	0.708	0.781	0.846	0.746	0.835	0.745
	N	312	312	312	312	311	311	311	312
logT15fd	Pearson Correlation	0.708	0.708	0.708	0.769	0.828	0.745	0.829	0.727
	N	341	341	341	341	340	340	340	341
logT16fd	Pearson Correlation	0.714	0.714	0.713	0.772	0.845	0.754	0.847	0.732
	N	342	342	342	342	341	341	341	342
logT2003fd	Pearson Correlation	0.701	0.701	0.7	0.806	0.855	0.746	0.85	0.743
	N	289	289	289	289	288	288	288	289
logT17d	Pearson Correlation	0.682	0.681	0.683	0.728	0.835	0.747	0.833	0.636
	N	336	336	336	336	336	336	336	336
logT18d	Pearson Correlation	0.7	0.7	0.701	0.736	0.821	0.741	0.827	0.644
	N	337	337	337	337	336	336	336	337
logT19d	Pearson Correlation	0.686	0.685	0.687	0.728	0.835	0.752	0.843	0.647
	N	352	352	352	352	351	351	351	352
logT20d	Pearson Correlation	0.677	0.675	0.678	0.729	0.835	0.736	0.833	0.668
	N	353	353	353	353	352	352	352	353
logT2004d	Pearson Correlation	0.72	0.719	0.721	0.764	0.844	0.76	0.847	0.649
	N	326	326	326	326	326	326	326	326
logT17fd	Pearson Correlation	0.696	0.696	0.696	0.749	0.828	0.748	0.831	0.668
	N	337	337	337	337	337	337	337	337
logT18fd	Pearson Correlation	0.702	0.702	0.701	0.733	0.815	0.735	0.826	0.661
	N	337	337	337	337	336	336	336	337
logT19fd	Pearson Correlation	0.686	0.685	0.686	0.726	0.825	0.747	0.837	0.659
	N	352	352	352	352	351	351	351	352
logT20fd	Pearson Correlation	0.678	0.677	0.678	0.744	0.828	0.728	0.821	0.708
	N	353	353	353	353	352	352	352	353
logT2004fd	Pearson Correlation	0.718	0.718	0.718	0.768	0.83	0.748	0.836	0.662
	N	326	326	326	326	326	326	326	326

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - Local Authority level

Variable		logdeinst15	logdeinst16	logdeinst17	logdeinst18	logrelationship	relationship2	relationship4	relationship5
logT2d	Pearson Correlation	0.756	0.726	0.723	0.736	0.793	0.489	0.627	0.652
	N	325	325	325	325	325	325	325	325
logT4d	Pearson Correlation	0.785	0.761	0.748	0.757	0.821	0.503	0.644	0.687
	N	329	329	329	329	329	329	329	329
logT1fd	Pearson Correlation	0.751	0.698	0.689	0.722	0.768	0.484	0.618	0.67
	N	326	326	326	326	326	326	326	326
logT2fd	Pearson Correlation	0.749	0.711	0.71	0.734	0.793	0.498	0.634	0.686
	N	325	325	325	325	325	325	325	325
logT4fd	Pearson Correlation	0.777	0.734	0.724	0.752	0.81	0.503	0.641	0.704
	N	329	329	329	329	329	329	329	329
logT5d	Pearson Correlation	0.782	0.756	0.749	0.763	0.808	0.5	0.643	0.68
	N	326	326	326	326	326	326	326	326
logT6d	Pearson Correlation	0.781	0.757	0.747	0.759	0.805	0.5	0.642	0.662
	N	318	318	318	318	318	318	318	318
logT7d	Pearson Correlation	0.799	0.769	0.765	0.764	0.825	0.496	0.642	0.667
	N	326	326	326	326	326	326	326	326
logT8d	Pearson Correlation	0.806	0.769	0.765	0.765	0.816	0.498	0.643	0.667
	N	332	332	332	332	332	332	332	332
logT2001d	Pearson Correlation	0.801	0.768	0.77	0.776	0.831	0.503	0.654	0.692
	N	291	291	291	291	291	291	291	291
logT5fd	Pearson Correlation	0.759	0.715	0.704	0.742	0.785	0.493	0.628	0.689
	N	327	327	327	327	327	327	327	327
logT6fd	Pearson Correlation	0.76	0.728	0.72	0.745	0.79	0.493	0.634	0.675
	N	317	317	317	317	317	317	317	317
logT7fd	Pearson Correlation	0.798	0.761	0.762	0.774	0.832	0.496	0.64	0.688
	N	326	326	326	326	326	326	326	326
logT8fd	Pearson Correlation	0.788	0.738	0.734	0.752	0.797	0.479	0.621	0.683
	N	332	332	332	332	332	332	332	332
logT2001fd	Pearson Correlation	0.785	0.742	0.745	0.764	0.822	0.497	0.645	0.707
	N	290	290	290	290	290	290	290	290
logT9d	Pearson Correlation	0.794	0.76	0.753	0.737	0.8	0.494	0.641	0.656
	N	328	328	328	328	328	328	328	328
logT10d	Pearson Correlation	0.816	0.789	0.785	0.776	0.829	0.521	0.673	0.695
	N	328	328	328	328	328	328	328	328
logT11d	Pearson Correlation	0.8	0.774	0.772	0.769	0.819	0.495	0.646	0.655
	N	319	319	319	319	319	319	319	319
logT12d	Pearson Correlation	0.802	0.78	0.769	0.776	0.815	0.499	0.648	0.668
	N	330	330	330	330	330	330	330	330
logT2002d	Pearson Correlation	0.818	0.791	0.784	0.781	0.83	0.502	0.658	0.671
	N	287	287	287	287	287	287	287	287
logT9fd	Pearson Correlation	0.79	0.745	0.739	0.742	0.801	0.484	0.63	0.684
	N	328	328	328	328	328	328	328	328
logT10fd	Pearson Correlation	0.786	0.749	0.745	0.758	0.805	0.506	0.655	0.729
	N	328	328	328	328	328	328	328	328
logT11fd	Pearson Correlation	0.804	0.766	0.767	0.779	0.829	0.496	0.65	0.697
	N	319	319	319	319	319	319	319	319
logT12fd	Pearson Correlation	0.795	0.766	0.766	0.79	0.82	0.501	0.648	0.704
	N	330	330	330	330	330	330	330	330
logT2002fd	Pearson Correlation	0.819	0.78	0.78	0.795	0.842	0.506	0.664	0.731
	N	284	284	284	284	284	284	284	284

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - Local Authority level

Variable		logdeinst15	logdeinst16	logdeinst17	logdeinst18	logrelationship1	relationship2	relationship4	relationship5
logT13d	Pearson Correlation	0.803	0.774	0.764	0.759	0.811	0.491	0.639	0.647
	N	331	331	331	331	331	331	331	331
logT14d	Pearson Correlation	0.826	0.793	0.791	0.77	0.83	0.497	0.647	0.648
	N	312	312	312	312	312	312	312	312
logT15d	Pearson Correlation	0.81	0.796	0.782	0.766	0.819	0.507	0.656	0.652
	N	341	341	341	341	341	341	341	341
logT16d	Pearson Correlation	0.821	0.812	0.802	0.779	0.833	0.521	0.674	0.667
	N	342	342	342	342	342	342	342	342
logT2003d	Pearson Correlation	0.835	0.809	0.8	0.782	0.845	0.496	0.651	0.649
	N	290	290	290	290	290	290	290	290
logT13fd	Pearson Correlation	0.806	0.778	0.767	0.779	0.828	0.503	0.652	0.682
	N	331	331	331	331	331	331	331	331
logT14fd	Pearson Correlation	0.843	0.815	0.815	0.8	0.857	0.516	0.672	0.687
	N	312	312	312	312	312	312	312	312
logT15fd	Pearson Correlation	0.826	0.812	0.804	0.796	0.844	0.528	0.679	0.698
	N	341	341	341	341	341	341	341	341
logT16fd	Pearson Correlation	0.837	0.816	0.819	0.801	0.854	0.533	0.685	0.705
	N	342	342	342	342	342	342	342	342
logT2003fd	Pearson Correlation	0.851	0.831	0.823	0.818	0.877	0.513	0.67	0.684
	N	289	289	289	289	289	289	289	289
logT17d	Pearson Correlation	0.787	0.779	0.766	0.734	0.8	0.516	0.667	0.647
	N	336	336	336	336	336	336	336	336
logT18d	Pearson Correlation	0.782	0.773	0.761	0.722	0.784	0.498	0.648	0.651
	N	337	337	337	337	337	337	337	337
logT19d	Pearson Correlation	0.797	0.793	0.779	0.744	0.804	0.514	0.667	0.641
	N	352	352	352	352	352	352	352	352
logT20d	Pearson Correlation	0.798	0.797	0.789	0.758	0.806	0.513	0.66	0.641
	N	353	353	353	353	353	353	353	353
logT2004d	Pearson Correlation	0.798	0.79	0.775	0.738	0.805	0.518	0.671	0.67
	N	326	326	326	326	326	326	326	326
logT17fd	Pearson Correlation	0.802	0.788	0.779	0.762	0.82	0.528	0.676	0.678
	N	337	337	337	337	337	337	337	337
logT18fd	Pearson Correlation	0.789	0.767	0.762	0.731	0.795	0.502	0.648	0.676
	N	337	337	337	337	337	337	337	337
logT19fd	Pearson Correlation	0.797	0.781	0.782	0.749	0.809	0.52	0.667	0.66
	N	352	352	352	352	352	352	352	352
logT20fd	Pearson Correlation	0.813	0.795	0.802	0.78	0.823	0.514	0.654	0.662
	N	353	353	353	353	353	353	353	353
logT2004fd	Pearson Correlation	0.795	0.781	0.776	0.751	0.817	0.523	0.671	0.688
	N	326	326	326	326	326	326	326	326

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - Local Authority level

Variable		poverty1	logpoverty2	logpoverty3	logpoverty4	logpoverty5	poverty6	logpoorhealth1	migration2
logT2d	Pearson Correlation	0.647	0.779	0.713	0.699	0.688	0.661	0.721	0.64
	N	325	325	325	325	325	325	325	325
logT4d	Pearson Correlation	0.668	0.804	0.744	0.734	0.728	0.683	0.779	0.665
	N	329	329	329	329	329	329	329	329
logT1fd	Pearson Correlation	0.655	0.752	0.704	0.685	0.711	0.658	0.719	0.662
	N	326	326	326	326	326	326	326	326
logT2fd	Pearson Correlation	0.655	0.752	0.685	0.67	0.672	0.671	0.7	0.683
	N	325	325	325	325	325	325	325	325
logT4fd	Pearson Correlation	0.666	0.776	0.711	0.701	0.708	0.682	0.749	0.701
	N	329	329	329	329	329	329	329	329
logT5d	Pearson Correlation	0.67	0.801	0.746	0.729	0.732	0.684	0.776	0.661
	N	326	326	326	326	326	326	326	326
logT6d	Pearson Correlation	0.667	0.806	0.752	0.747	0.734	0.683	0.745	0.657
	N	318	318	317	317	318	318	318	318
logT7d	Pearson Correlation	0.673	0.824	0.763	0.757	0.733	0.687	0.764	0.651
	N	326	326	326	326	326	326	326	326
logT8d	Pearson Correlation	0.671	0.817	0.756	0.747	0.746	0.686	0.753	0.656
	N	332	332	331	331	332	332	332	332
logT2001d	Pearson Correlation	0.687	0.83	0.773	0.768	0.747	0.698	0.806	0.661
	N	291	291	291	291	291	291	291	291
logT5fd	Pearson Correlation	0.662	0.758	0.707	0.688	0.7	0.67	0.73	0.685
	N	327	327	327	327	327	327	327	327
logT6fd	Pearson Correlation	0.664	0.777	0.724	0.714	0.711	0.681	0.721	0.684
	N	317	317	316	316	317	317	317	317
logT7fd	Pearson Correlation	0.676	0.807	0.744	0.726	0.719	0.688	0.74	0.691
	N	326	326	326	326	326	326	326	326
logT8fd	Pearson Correlation	0.658	0.774	0.713	0.687	0.712	0.669	0.712	0.693
	N	332	332	331	331	332	332	332	332
logT2001fd	Pearson Correlation	0.687	0.798	0.741	0.732	0.724	0.695	0.772	0.697
	N	290	290	290	290	290	290	290	290
logT9d	Pearson Correlation	0.681	0.821	0.769	0.763	0.745	0.687	0.755	0.647
	N	328	328	327	327	328	328	328	328
logT10d	Pearson Correlation	0.706	0.835	0.793	0.784	0.766	0.718	0.777	0.673
	N	328	328	327	327	328	328	328	328
logT11d	Pearson Correlation	0.677	0.836	0.782	0.778	0.761	0.693	0.771	0.64
	N	319	319	318	318	319	319	319	319
logT12d	Pearson Correlation	0.674	0.827	0.779	0.773	0.75	0.693	0.765	0.64
	N	330	330	329	329	330	330	330	330
logT2002d	Pearson Correlation	0.692	0.849	0.798	0.791	0.767	0.705	0.783	0.664
	N	287	287	286	286	287	287	287	287
logT9fd	Pearson Correlation	0.674	0.798	0.735	0.711	0.731	0.684	0.737	0.696
	N	328	328	327	327	328	328	328	328
logT10fd	Pearson Correlation	0.696	0.788	0.749	0.718	0.73	0.705	0.76	0.707
	N	328	328	327	327	328	328	328	328
logT11fd	Pearson Correlation	0.692	0.821	0.762	0.739	0.75	0.706	0.755	0.699
	N	319	319	318	318	319	319	319	319
logT12fd	Pearson Correlation	0.672	0.804	0.75	0.722	0.73	0.693	0.742	0.69
	N	330	330	329	329	330	330	330	330
logT2002fd	Pearson Correlation	0.702	0.831	0.77	0.742	0.753	0.715	0.79	0.729
	N	284	284	283	283	284	284	284	284

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - Local Authority level

Variable		poverty1	logpoverty2	logpoverty3	logpoverty4	logpoverty5	poverty6	logpoorhealth1	migration2
logT13d	Pearson Correlation	0.67	0.834	0.785	0.779	0.756	0.685	0.775	0.625
	N	331	331	330	330	331	331	331	331
logT14d	Pearson Correlation	0.686	0.857	0.804	0.802	0.781	0.696	0.794	0.619
	N	312	312	311	311	312	312	312	312
logT15d	Pearson Correlation	0.7	0.862	0.821	0.822	0.799	0.705	0.795	0.621
	N	341	341	340	340	341	341	341	341
logT16d	Pearson Correlation	0.718	0.873	0.831	0.833	0.814	0.725	0.8	0.629
	N	342	342	341	341	342	342	342	342
logT2003d	Pearson Correlation	0.685	0.874	0.819	0.818	0.795	0.699	0.807	0.626
	N	290	290	289	289	290	290	290	290
logT13fd	Pearson Correlation	0.681	0.83	0.772	0.747	0.756	0.701	0.777	0.67
	N	331	331	330	330	331	331	331	331
logT14fd	Pearson Correlation	0.708	0.863	0.81	0.807	0.791	0.726	0.801	0.67
	N	312	312	311	311	312	312	312	312
logT15fd	Pearson Correlation	0.719	0.865	0.819	0.804	0.805	0.728	0.802	0.672
	N	341	341	340	340	341	341	341	341
logT16fd	Pearson Correlation	0.731	0.873	0.826	0.814	0.815	0.737	0.805	0.668
	N	342	342	341	341	342	342	342	342
logT2003fd	Pearson Correlation	0.699	0.886	0.82	0.817	0.809	0.721	0.827	0.668
	N	289	289	288	288	289	289	289	289
logT17d	Pearson Correlation	0.719	0.862	0.831	0.832	0.807	0.717	0.785	0.595
	N	336	336	336	336	336	336	336	336
logT18d	Pearson Correlation	0.713	0.846	0.828	0.831	0.79	0.706	0.796	0.593
	N	337	337	336	336	337	337	337	337
logT19d	Pearson Correlation	0.727	0.86	0.839	0.837	0.817	0.723	0.787	0.588
	N	352	352	351	351	352	352	352	352
logT20d	Pearson Correlation	0.709	0.86	0.829	0.827	0.806	0.707	0.785	0.599
	N	353	353	352	352	353	353	353	353
logT2004d	Pearson Correlation	0.733	0.871	0.849	0.849	0.815	0.726	0.825	0.601
	N	326	326	326	326	326	326	326	326
logT17fd	Pearson Correlation	0.729	0.861	0.824	0.813	0.813	0.725	0.789	0.632
	N	337	337	337	337	337	337	337	337
logT18fd	Pearson Correlation	0.714	0.84	0.825	0.813	0.775	0.705	0.784	0.624
	N	337	337	336	336	337	337	337	337
logT19fd	Pearson Correlation	0.727	0.855	0.832	0.815	0.801	0.72	0.772	0.612
	N	352	352	351	351	352	352	352	352
logT20fd	Pearson Correlation	0.703	0.851	0.81	0.791	0.793	0.698	0.776	0.63
	N	353	353	352	352	353	353	353	353
logT2004fd	Pearson Correlation	0.728	0.864	0.835	0.821	0.803	0.722	0.815	0.624
	N	326	326	326	326	326	326	326	326

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - County level

Variable		deinst2	deinst3	deinst4	deinst5	deinst6	deinst7	deinst8	deinst9	deinst10	logdrugs1	drugs6
logT2d'	Pearson Correlation	0.642	0.652	0.64	0.656	0.68	0.67	0.638	0.647	0.628	0.519	0.51
	N	120	118	121	121	119	123	123	123	122	123	123
logT4d'	Pearson Correlation	0.629	0.654	0.626	0.608	0.658	0.659	0.639	0.654	0.626	0.516	0.51
	N	123	122	125	125	123	127	127	127	126	127	127
logT1fd'	Pearson Correlation	0.647	0.641	0.594	0.59	0.634	0.647	0.645	0.656	0.605	0.487	0.472
	N	125	122	125	125	123	127	127	127	126	127	127
logT2fd'	Pearson Correlation	0.674	0.666	0.668	0.683	0.689	0.702	0.687	0.688	0.649	0.501	0.505
	N	119	117	120	120	118	122	122	122	121	122	122
logT4fd'	Pearson Correlation	0.652	0.659	0.626	0.608	0.628	0.666	0.653	0.656	0.624	0.454	0.462
	N	124	123	126	126	124	128	128	128	127	128	128
logT5d'	Pearson Correlation	0.637	0.633	0.617	0.62	0.652	0.661	0.645	0.641	0.607	0.479	0.498
	N	125	123	125	125	123	127	127	127	126	127	127
logT6d'	Pearson Correlation	0.62	0.626	0.612	0.633	0.633	0.649	0.596	0.598	0.57	0.509	0.478
	N	116	114	116	116	115	119	119	119	118	118	118
logT7d'	Pearson Correlation	0.625	0.636	0.606	0.643	0.583	0.614	0.595	0.582	0.561	0.459	0.453
	N	121	121	123	123	121	125	125	125	124	125	125
logT8d'	Pearson Correlation	0.63	0.637	0.611	0.637	0.593	0.62	0.597	0.605	0.583	0.523	0.486
	N	127	126	129	129	128	132	132	132	131	131	131
logT2001d'	Pearson Correlation	0.609	0.629	0.639	0.668	0.64	0.661	0.626	0.623	0.594	0.508	0.488
	N	101	100	102	102	100	104	104	104	103	104	104
logT5fd'	Pearson Correlation	0.666	0.641	0.619	0.614	0.656	0.678	0.675	0.673	0.623	0.46	0.479
	N	125	123	125	125	123	127	127	127	126	127	127
logT6fd'	Pearson Correlation	0.632	0.624	0.605	0.632	0.621	0.675	0.633	0.625	0.588	0.461	0.463
	N	116	114	116	116	115	119	119	119	118	118	118
logT7fd'	Pearson Correlation	0.647	0.639	0.61	0.635	0.592	0.636	0.622	0.606	0.573	0.431	0.456
	N	121	121	123	123	121	125	125	125	124	125	125
logT8fd'	Pearson Correlation	0.642	0.611	0.586	0.607	0.589	0.628	0.617	0.618	0.578	0.464	0.462
	N	127	126	129	129	128	132	132	132	131	131	131
logT2001fd'	Pearson Correlation	0.632	0.638	0.64	0.657	0.626	0.686	0.669	0.657	0.606	0.484	0.487
	N	99	98	100	100	98	102	102	102	101	102	102

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - County level

Variable		deinst2	deinst3	deinst4	deinst5	deinst6	deinst7	deinst8	deinst9	deinst10	logdrugs1	drugs6
logT9d[1]	Pearson Correlation	0.646	0.648	0.624	0.655	0.606	0.629	0.603	0.605	0.591	0.572	0.51
	N	125	123	125	125	124	128	128	128	127	127	127
logT10d[1]	Pearson Correlation	0.632	0.65	0.61	0.62	0.59	0.629	0.575	0.59	0.58	0.547	0.533
	N	123	122	124	124	124	127	127	127	126	126	126
logT11d[1]	Pearson Correlation	0.605	0.613	0.666	0.709	0.601	0.621	0.587	0.614	0.594	0.617	0.524
	N	119	116	119	119	118	122	122	122	121	121	121
logT12d[1]	Pearson Correlation	0.639	0.663	0.665	0.692	0.632	0.633	0.592	0.605	0.578	0.619	0.567
	N	121	122	124	123	124	126	126	126	125	125	125
logT2002d[1]	Pearson Correlation	0.612	0.641	0.656	0.69	0.637	0.647	0.601	0.621	0.591	0.581	0.535
	N	95	95	96	95	96	98	98	98	97	97	97
logT9fd[1]	Pearson Correlation	0.666	0.634	0.614	0.639	0.615	0.644	0.638	0.628	0.593	0.496	0.501
	N	124	122	124	124	124	127	127	127	126	126	126
logT10fd[1]	Pearson Correlation	0.656	0.632	0.616	0.611	0.623	0.659	0.616	0.633	0.598	0.496	0.522
	N	123	122	124	124	124	127	127	127	126	126	126
logT11fd[1]	Pearson Correlation	0.636	0.629	0.652	0.695	0.618	0.655	0.623	0.649	0.611	0.562	0.529
	N	118	115	118	118	117	121	121	121	120	120	120
logT12fd[1]	Pearson Correlation	0.654	0.656	0.658	0.674	0.652	0.653	0.621	0.63	0.588	0.545	0.549
	N	121	122	124	123	124	126	126	126	125	125	125
logT2002fd[1]	Pearson Correlation	0.635	0.638	0.655	0.691	0.673	0.684	0.659	0.659	0.6	0.523	0.542
	N	94	93	94	93	94	96	96	96	95	95	95
logT13d[1]	Pearson Correlation	0.636	0.661	0.662	0.675	0.633	0.652	0.602	0.623	0.608	0.623	0.555
	N	124	122	125	125	125	128	128	128	127	127	127
logT14d[1]	Pearson Correlation	0.62	0.664	0.633	0.638	0.613	0.624	0.584	0.583	0.565	0.587	0.533
	N	113	111	113	113	113	116	116	116	115	115	115
logT15d[1]	Pearson Correlation	0.619	0.661	0.658	0.653	0.607	0.624	0.597	0.607	0.598	0.641	0.55
	N	134	132	135	135	135	138	138	138	137	137	137
logT16d[1]	Pearson Correlation	0.65	0.694	0.663	0.656	0.624	0.619	0.597	0.605	0.593	0.658	0.578
	N	133	132	135	135	136	138	138	138	137	137	137

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - County level

Variable		deinst2	deinst3	deinst4	deinst5	deinst6	deinst7	deinst8	deinst9	deinst10	logdrugs1	drugs6
logT2003d'	Pearson Correlation	0.634	0.686	0.657	0.64	0.605	0.613	0.59	0.589	0.58	0.646	0.572
	N	102	100	102	102	102	105	105	105	104	104	104
logT13fd'	Pearson Correlation	0.669	0.689	0.679	0.685	0.656	0.685	0.656	0.667	0.632	0.584	0.568
	N	124	122	125	125	125	128	128	128	127	127	127
logT14fd'	Pearson Correlation	0.671	0.689	0.668	0.673	0.634	0.662	0.63	0.624	0.595	0.608	0.559
	N	113	111	113	113	113	116	116	116	115	115	115
logT15fd'	Pearson Correlation	0.671	0.682	0.693	0.676	0.653	0.671	0.655	0.66	0.634	0.635	0.572
	N	134	132	135	135	135	138	138	138	137	137	137
logT16fd'	Pearson Correlation	0.703	0.713	0.696	0.671	0.654	0.64	0.637	0.646	0.623	0.646	0.599
	N	133	132	135	135	136	138	138	138	137	137	137
logT2003fd'	Pearson Correlation	0.653	0.7	0.689	0.692	0.603	0.625	0.607	0.599	0.571	0.641	0.587
	N	97	95	97	97	98	100	100	100	99	99	99
logT17d'	Pearson Correlation	0.604	0.627	0.617	0.636	0.603	0.599	0.558	0.58	0.568	0.629	0.547
	N	127	127	130	130	129	132	132	132	131	132	132
logT18d'	Pearson Correlation	0.614	0.633	0.654	0.674	0.635	0.606	0.583	0.612	0.604	0.663	0.573
	N	130	128	131	131	130	134	134	134	133	133	133
logT19d'	Pearson Correlation	0.615	0.659	0.63	0.631	0.611	0.601	0.569	0.581	0.574	0.664	0.603
	N	143	142	145	145	144	148	148	148	147	147	147
logT20d'	Pearson Correlation	0.626	0.648	0.637	0.634	0.611	0.606	0.583	0.596	0.584	0.649	0.557
	N	144	143	146	146	145	149	149	149	148	148	148
logT2004d'	Pearson Correlation	0.615	0.648	0.636	0.649	0.623	0.609	0.574	0.592	0.582	0.651	0.582
	N	121	120	123	123	122	125	125	125	124	125	125
logT17fd'	Pearson Correlation	0.687	0.689	0.693	0.694	0.671	0.657	0.642	0.664	0.627	0.63	0.58
	N	128	128	131	131	130	133	133	133	132	133	133
logT18fd'	Pearson Correlation	0.666	0.661	0.658	0.673	0.642	0.626	0.626	0.661	0.627	0.627	0.59
	N	130	128	131	131	130	134	134	134	133	133	133
logT19fd'	Pearson Correlation	0.662	0.68	0.661	0.647	0.64	0.636	0.622	0.636	0.612	0.637	0.597
	N	143	142	145	145	144	148	148	148	147	147	147
logT20fd'	Pearson Correlation	0.657	0.66	0.651	0.638	0.626	0.627	0.621	0.637	0.615	0.603	0.555
	N	144	143	146	146	145	149	149	149	148	148	148
logT2004fd'	Pearson Correlation	0.675	0.68	0.667	0.665	0.656	0.636	0.631	0.652	0.615	0.636	0.605
	N	122	121	124	124	122	126	126	126	125	126	126

all correlations are significant at the .001 level (one-tailed)

Figure 26 - Bivariate analysis - Pearson's correlation coefficents - PCT level

Variable		logpoorhealth2	logpoorhealth3
logT2d^2	Pearson Correlation	0.542	0.523
	N	178	178
logT4d^2	Pearson Correlation	0.543	0.512
	N	183	183
logT1fd^2	Pearson Correlation	0.539	0.494
	N	182	182
logT2fd^2	Pearson Correlation	0.551	0.541
	N	179	179
logT4fd^2	Pearson Correlation	0.551	0.522
	N	183	183
logT5d^2	Pearson Correlation	0.533	0.498
	N	182	182
logT6d^2	Pearson Correlation	0.494	0.471
	N	174	174
logT7d^2	Pearson Correlation	0.528	0.488
	N	179	179
logT8d^2	Pearson Correlation	0.538	0.493
	N	184	184
logT2001d^2	Pearson Correlation	0.545	0.514
	N	159	159
logT5fd^2	Pearson Correlation	0.541	0.506
	N	183	183
logT6fd^2	Pearson Correlation	0.547	0.517
	N	173	173
logT7fd^2	Pearson Correlation	0.575	0.537
	N	179	179
logT8fd^2	Pearson Correlation	0.533	0.505
	N	184	184
logT2001fd^2	Pearson Correlation	0.568	0.533
	N	157	157
logT9d^2	Pearson Correlation	0.496	0.479
	N	179	179
logT10d^2	Pearson Correlation	0.548	0.541
	N	182	182
logT11d^2	Pearson Correlation	0.555	0.56
	N	174	174
logT12d^2	Pearson Correlation	0.566	0.552
	N	182	182
logT2002d^2	Pearson Correlation	0.563	0.549
	N	152	152
logT9fd^2	Pearson Correlation	0.528	0.523
	N	179	179
logT10fd^2	Pearson Correlation	0.542	0.544
	N	182	182
logT11fd^2	Pearson Correlation	0.575	0.598
	N	174	174
logT12fd^2	Pearson Correlation	0.572	0.572
	N	182	182
logT2002fd^2	Pearson Correlation	0.575	0.565
	N	150	150

Variable		logpoorhealth2	logpoorhealth3
logT13d^2	Pearson Correlation	0.537	0.551
	N	185	185
logT14d^2	Pearson Correlation	0.558	0.595
	N	173	173
logT15d^2	Pearson Correlation	0.548	0.589
	N	192	192
logT16d^2	Pearson Correlation	0.545	0.574
	N	191	191
logT2003d^2	Pearson Correlation	0.564	0.616
	N	161	161
logT13fd^2	Pearson Correlation	0.572	0.592
	N	185	185
logT14fd^2	Pearson Correlation	0.586	0.624
	N	173	173
logT15fd^2	Pearson Correlation	0.575	0.601
	N	192	192
logT16fd^2	Pearson Correlation	0.576	0.591
	N	191	191
logT2003fd^2	Pearson Correlation	0.609	0.652
	N	159	159
logT17d^2	Pearson Correlation	0.536	0.557
	N	187	187
logT18d^2	Pearson Correlation	0.531	0.551
	N	189	189
logT19d^2	Pearson Correlation	0.535	0.561
	N	198	198
logT20d^2	Pearson Correlation	0.539	0.556
	N	199	199
logT2004d^2	Pearson Correlation	0.54	0.561
	N	183	183
logT17fd^2	Pearson Correlation	0.58	0.597
	N	188	188
logT18fd^2	Pearson Correlation	0.573	0.6
	N	189	189
logT19fd^2	Pearson Correlation	0.579	0.588
	N	198	198
logT20fd^2	Pearson Correlation	0.574	0.577
	N	199	199
logT2004fd^2	Pearson Correlation	0.589	0.597
	N	182	182

all correlations are significant at the .001 level (one-tailed)

Figure 27 - Bivariate analysis - Pearson's correlation coefficients for remaining predictor variables showing multicollinearity

Variables		gen2	gen3	gen4	logsexage1	logsexage3	logsexage6	logpoverty2	logpoverty3	logpoverty5	poverty6	logdeinst15	logdeinst16	logdeinst17	lodeinst18
gen2	Pearson's correlation	1	1	1	0.837	0.784	0.744	0.78	0.737	0.741	0.971	0.741	0.758	0.768	0.744
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353
gen3	Pearson's correlation	1	1	0.999	0.838	0.784	0.743	0.778	0.734	0.739	0.969	0.74	0.757	0.768	0.745
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353
gen4	Pearson's correlation	1	0.999	1	0.836	0.784	0.745	0.782	0.739	0.743	0.971	0.741	0.758	0.767	0.742
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353
logsexage1	Pearson's correlation	0.837	0.838	0.836	1	0.882	0.833	0.886	0.79	0.826	0.794	0.827	0.856	0.862	0.862
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353
logsexage3	Pearson's correlation	0.784	0.784	0.784	0.882	1	0.969	0.957	0.91	0.892	0.805	0.89	0.902	0.916	0.881
	N	352	352	352	352	352	352	352	352	352	352	352	352	352	352
logsexage6	Pearson's correlation	0.744	0.743	0.745	0.833	0.969	1	0.962	0.937	0.905	0.785	0.854	0.877	0.873	0.831
	N	352	353	352	352	352	352	352	352	352	352	352	352	352	352
logpoverty2	Pearson's correlation	0.78	0.778	0.782	0.886	0.957	0.962	1	0.958	0.944	0.814	0.897	0.909	0.902	0.881
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353
logpoverty3	Pearson's correlation	0.737	0.734	0.739	0.79	0.91	0.937	0.958	1	0.953	0.781	0.852	0.851	0.844	0.807
	N	352	352	352	352	352	352	352	352	352	352	352	352	352	352
logpoverty5	Pearson's correlation	0.741	0.739	0.743	0.826	0.892	0.905	0.944	0.953	1	0.776	0.855	0.879	0.869	0.843
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353
poverty6	Pearson's correlation	0.971	0.969	0.971	0.794	0.805	0.785	0.814	0.781	0.776	1	0.746	0.772	0.772	0.743
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353
logdeinst15	Pearson's correlation	0.741	0.74	0.741	0.827	0.89	0.854	0.897	0.852	0.855	0.746	1	0.886	0.894	0.874
	N	353	353	353	353	352	352	353	353	353	353	353	353	353	353
logdeinst16	Pearson's correlation	0.758	0.757	0.758	0.856	0.902	0.877	0.909	0.851	0.879	0.772	0.886	1	0.933	0.929
	N	0.353	353	353	353	352	352	353	352	353	353	353	353	353	353
logdeinst17	Pearson's correlation	0.768	0.768	0.767	0.862	0.916	0.873	0.902	0.844	0.869	0.772	0.894	0.933	1	0.936
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353
logdeinst18	Pearson's correlation	0.744	0.745	0.742	0.862	0.881	0.831	0.881	0.807	0.843	0.743	0.874	0.929	0.936	1
	N	353	353	353	353	352	352	353	352	353	353	353	353	353	353

all correlations significant at the 0.001 level (1-tailed)

Figure 27 - Bivariate analysis - Pearson's correlation coefficients for remaining predictor variables showing multicollinearity

Variables		deinst3	deinst5	deinst7
deinst3	Pearson's correlation	1	0.809	0.821
	N	143	141	143
deinst5	Pearson's correlation	0.809	1	0.886
	N	141	146	146
deinst7	Pearson's correlation	0.821	0.886	1
	N	143	141	149

all correlations significant at the 0.01 level (one-tailed)

County level variables

Figure 28 - bivariate analysis - scatterplot summary for final selection of potential variables

Local Authority level variables	gen2	logpoorhealth1	logethnicity2	logpoverty2	logpoverty3	logrelationship1	relationship5	logsexage3	lodeinst18	migration2
gen2	/									
logpoorhealth1	strong curvilinear	/								
logethnicity2	weak curvilinear	moderate linear	/							
logpoverty2	strong curvilinear	v.strong linear	moderate linear	/						
logpoverty3	moderate linear	strong linear	v. weak linear	v.strong linear	/					
logrelationship1	v.strong (curvi)linear	v.strong linear	strong linear	v.strong linear	strong linear	/				
relationship5	moderate linear	no visible pattern	moderate curvillinear	v.weak curvilinear	moderate curvilinear	moderate curvilinear	/			
logsexage3	moderate linear	v.strong linear	moderate linear	v.strong linear	v.strong linear	v.strong linear	weak curvilinear	/		
logdeinst18	strong curvilinear	strong linear	strong linear	v.strong linear	strong linear	v.strong linear	moderate curvilinear	strong linear	/	
migration2	no visible pattern	no visible pattern	moderate curvillinear	no visible pattern	weak curvilinear	weak curvilinear	v.weak linear	no visible pattern	moderate curvilinear	/

County level variables	logdrugs1	deinst7
logdrugs1	/	
deinst7	weak curvilinear	/

Figure 29 - bivariate analysis - Pearson's correlation coefficients for final selection of possible predictor variables

Local Authority level variables		gen2	logpoorhealth1	logethnicity2	logpoverty2	logpoverty3	logrelationship	relationship5	logsexage3	lodeinst18	migration2
gen2	Pearson's correlation	1	0.831	0.741	0.78	0.737	0.823	0.901	0.784	0.744	0.764
	N	353	353	353	353	352	353	353	352	353	353
logpoorhealth1	Pearson's correlation	0.831	1	0.717	0.949	0.879	0.915	0.723	0.906	0.845	0.607
	N	353	353	353	353	352	353	353	352	353	353
logethnicity2	Pearson's correlation	0.741	0.717	1	0.751	0.666	0.879	0.774	0.746	0.848	0.82
	N	353	353	353	353	352	353	353	352	353	353
logpoverty2	Pearson's correlation	0.78	0.949	0.751	1	0.958	0.931	0.706	0.957	0.881	0.641
	N	353	353	353	353	353	353	353	352	353	353
logpoverty3	Pearson's correlation	0.737	0.879	0.666	0.958	1	0.84	0.672	0.91	0.807	0.601
	N	352	352	352	352	352	352	352	352	352	352
logrelationship1	Pearson's correlation	0.823	0.915	0.879	0.931	0.84	1	0.787	0.924	0.912	0.75
	N	353	353	353	353	352	353	353	352	353	353
relationship5	Pearson's correlation	0.901	0.723	0.774	0.706	0.672	0.787	1	0.718	0.734	0.86
	N	353	353	353	353	352	353	353	352	353	353
logsexage3	Pearson's correlation	0.784	0.906	0.746	0.957	0.91	0.924	0.718	1	0.881	0.612
	N	352	352	352	352	352	352	352	352	352	352
logdeinst18	Pearson's correlation	0.744	0.845	0.848	0.881	0.807	0.912	0.734	0.881	1	0.692
	N	353	353	353	353	352	353	353	352	353	353
migration2	Pearson's correlation	0.764	0.607	0.82	0.641	0.601	0.75	0.86	0.612	0.692	1
	N	353	353	353	353	352	353	353	352	353	353

County level variables		logdrugs1	deinst7
logdrugs1	Pearson's correlation	1	0.51
	N	148	148
deinst7	Pearson's correlation	0.51	1
	N	148	149

all correlations significant at the 0.001 level (1-tailed)

Figure 30a - Pearson's correlation coefficients for variable deinst2 and all potential outcome variables shown chronologically

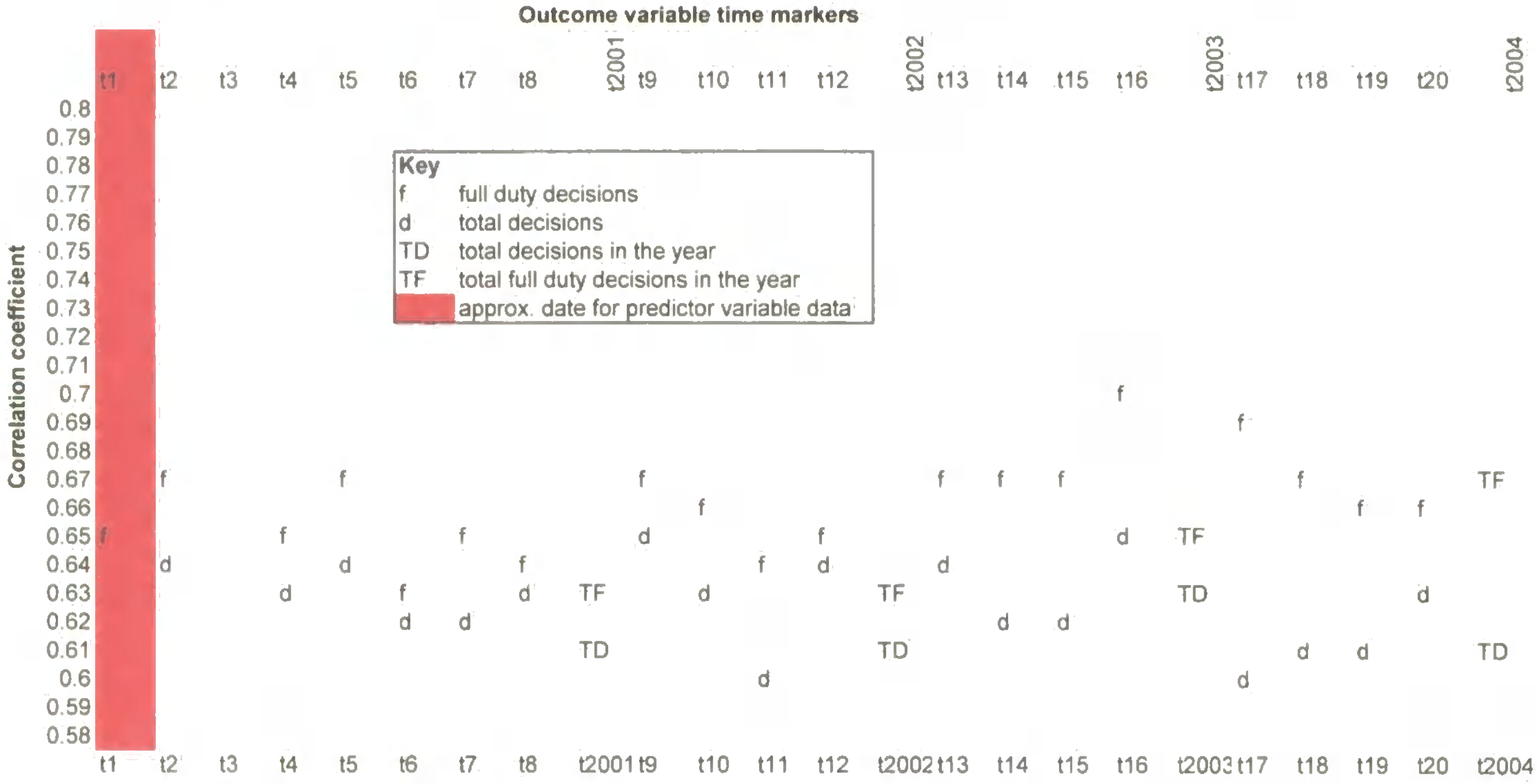


Figure 30b - Pearson's correlation coefficients for variable deinst3 and all potential outcome variables shown chronologically

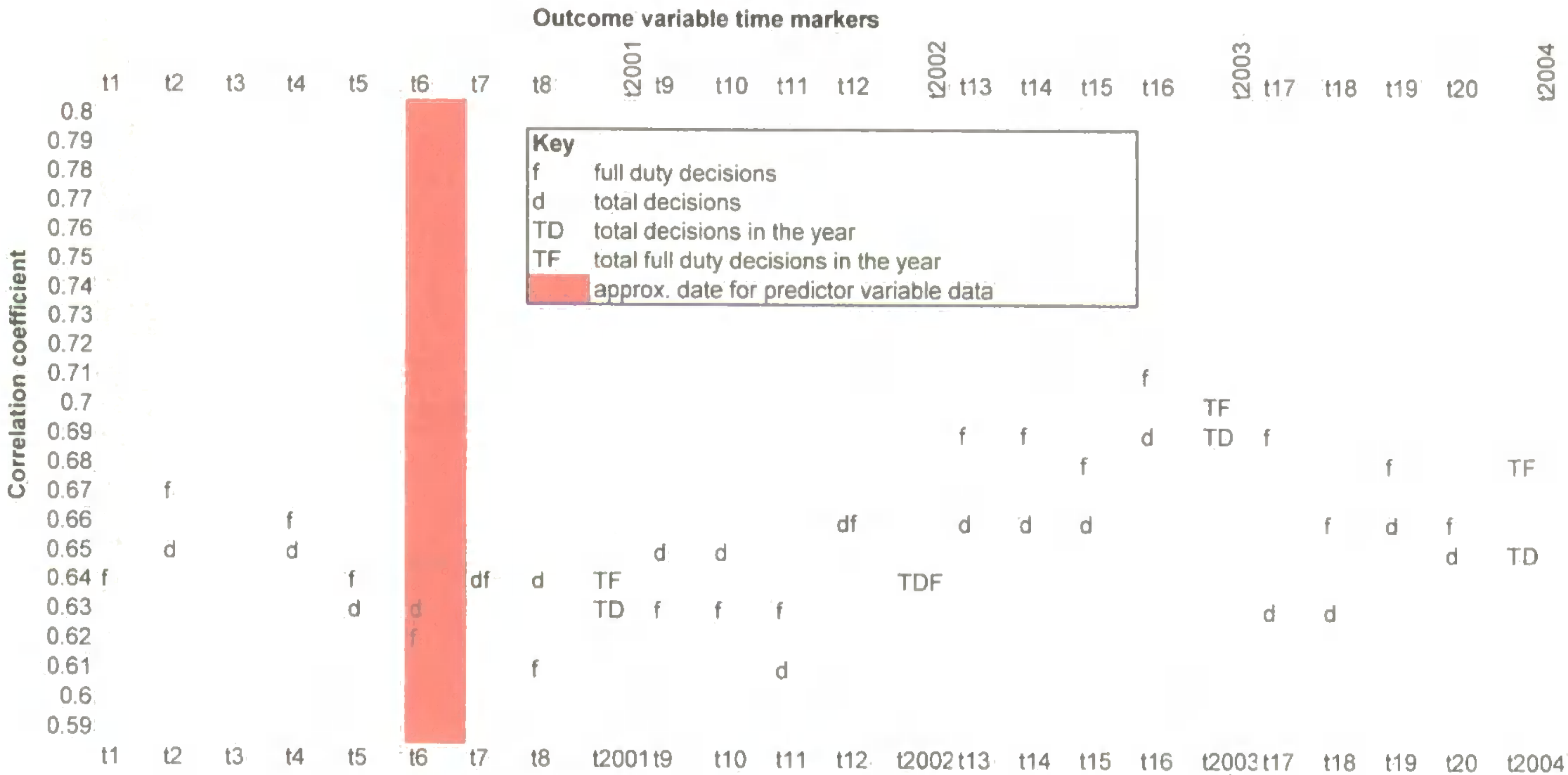


Figure 30c - Pearson's correlation coefficients for variable deinst4 and all potential outcome variables shown chronologically

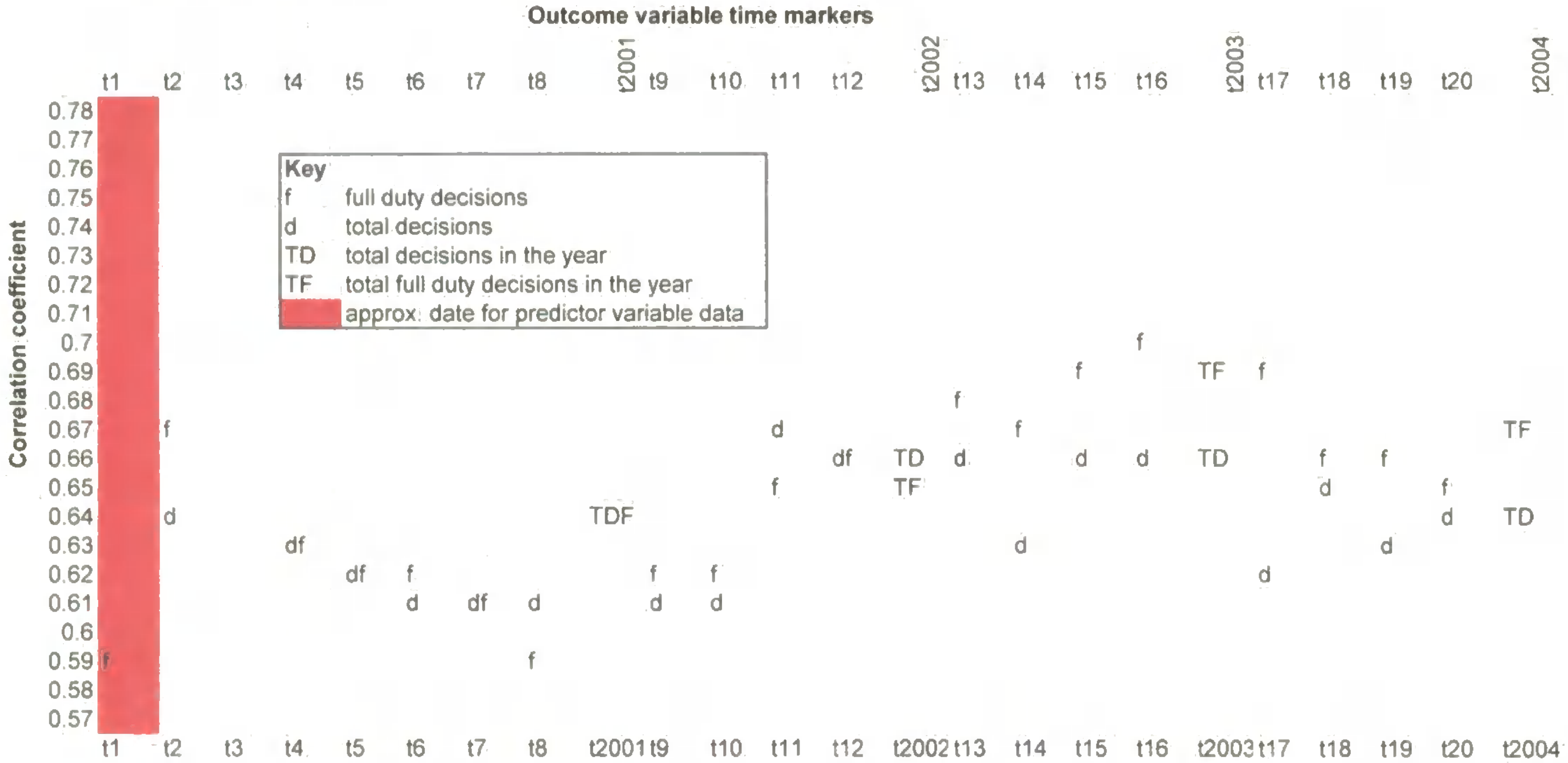


Figure 30d - Pearson's correlation coefficients for variable deinst5 and all potential outcome variables shown chronologically

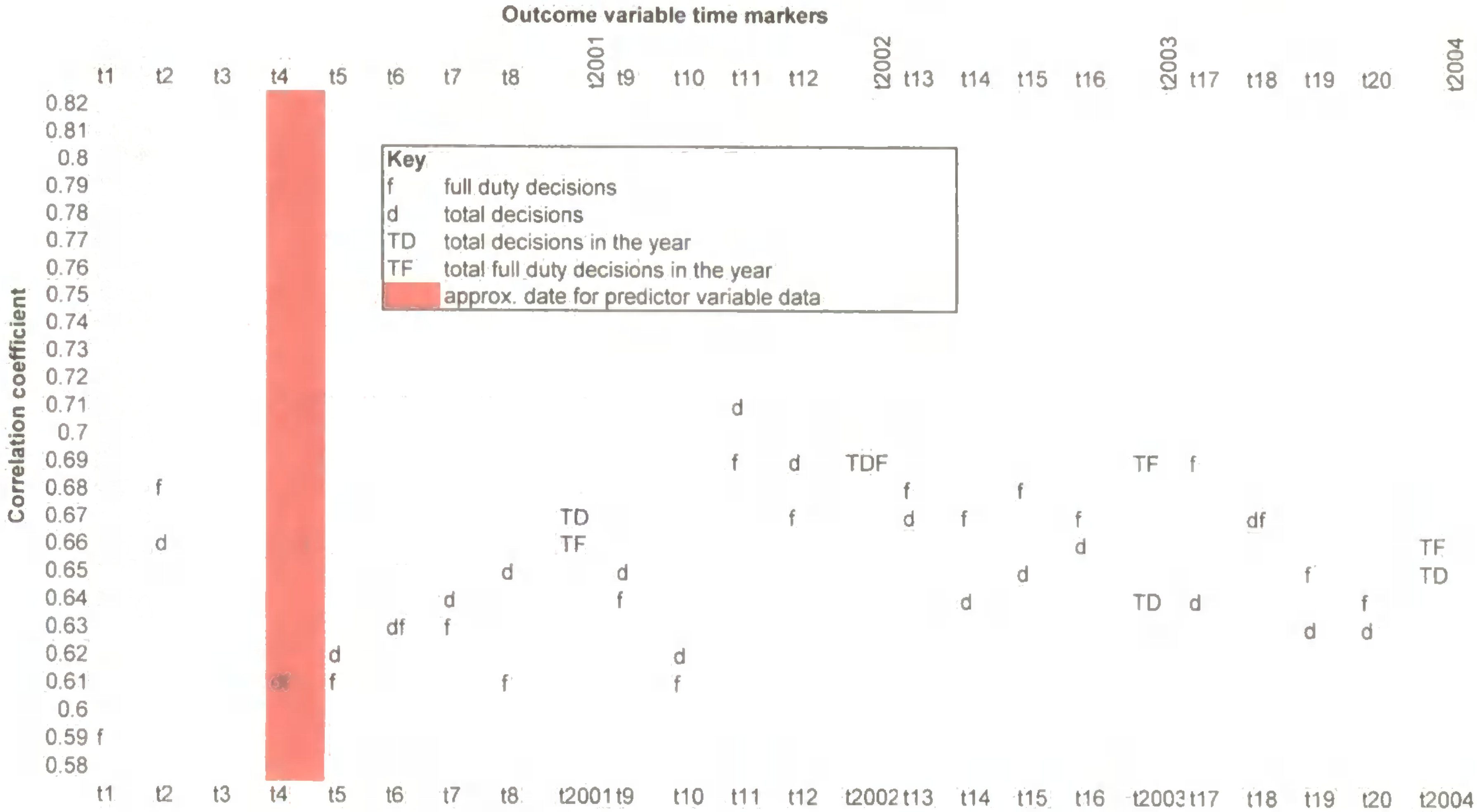


Figure 30e - Pearson's correlation coefficients for variable deinst6 and all potential outcome variables shown chronologically

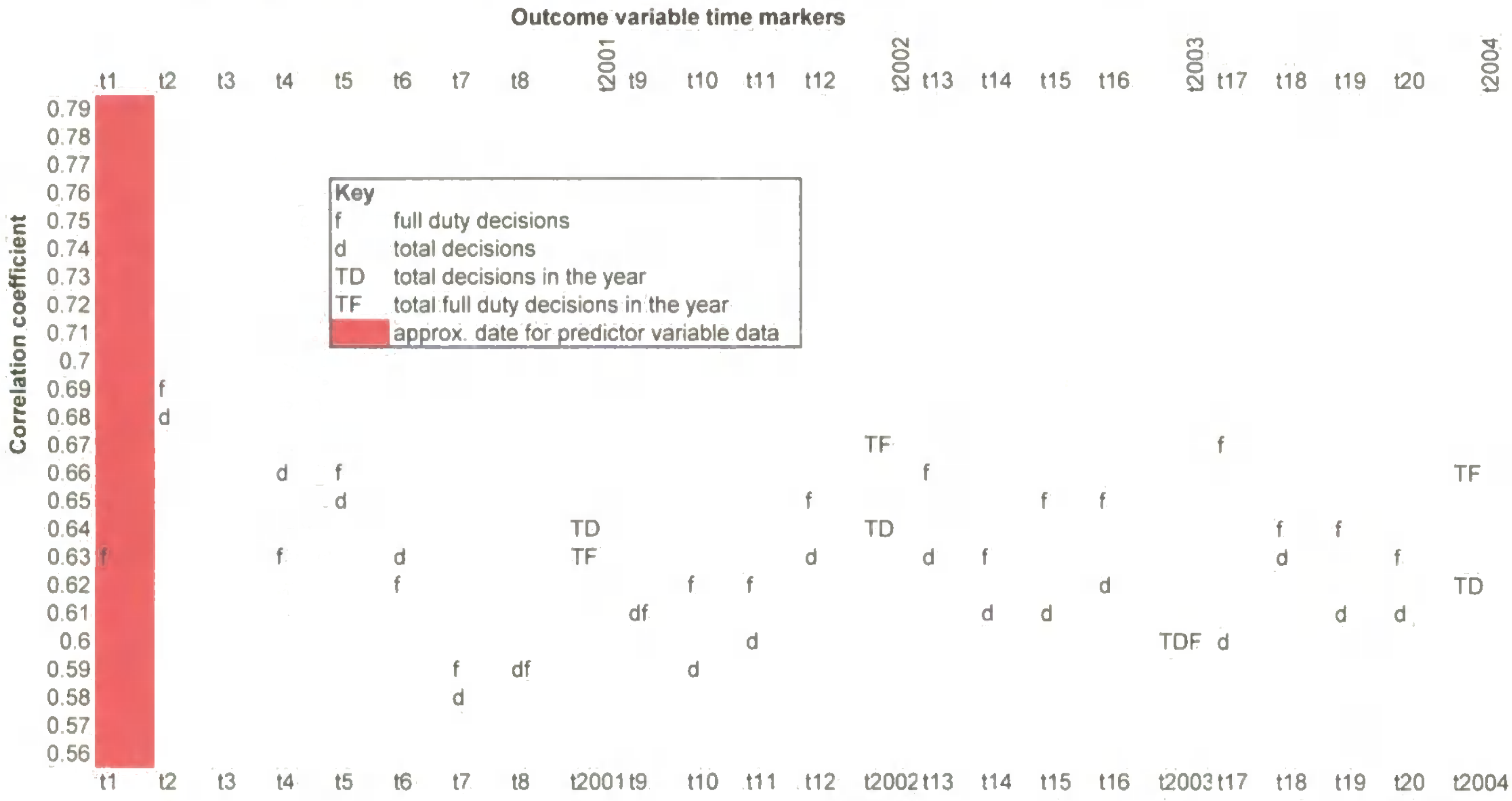


Figure 30f - Pearson's correlation coefficients for variable deinst7 and all potential outcome variables shown chronologically

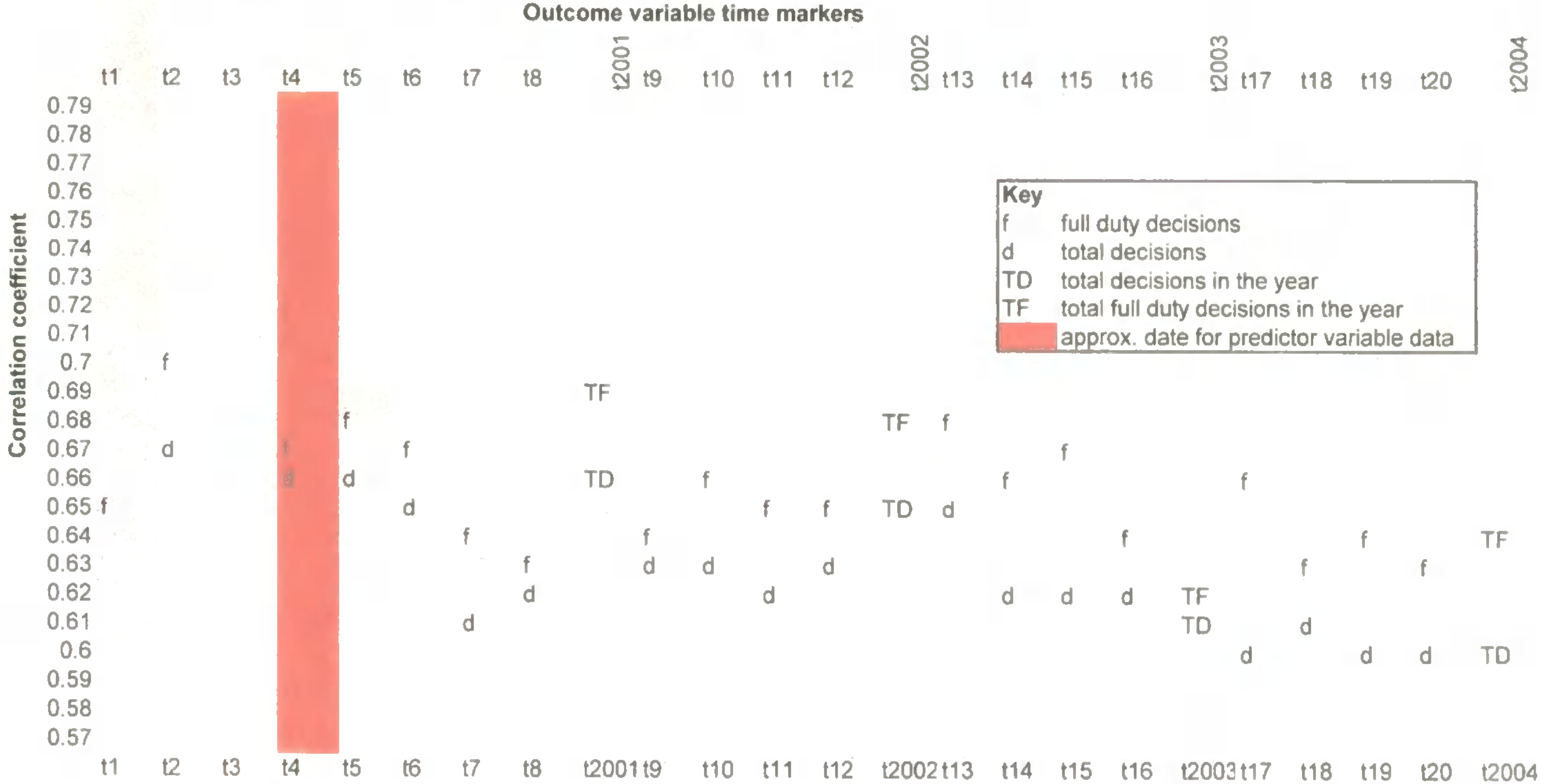


Figure 30g - Pearson's correlation coefficients for variable deinst8 and all potential outcome variables shown chronologically

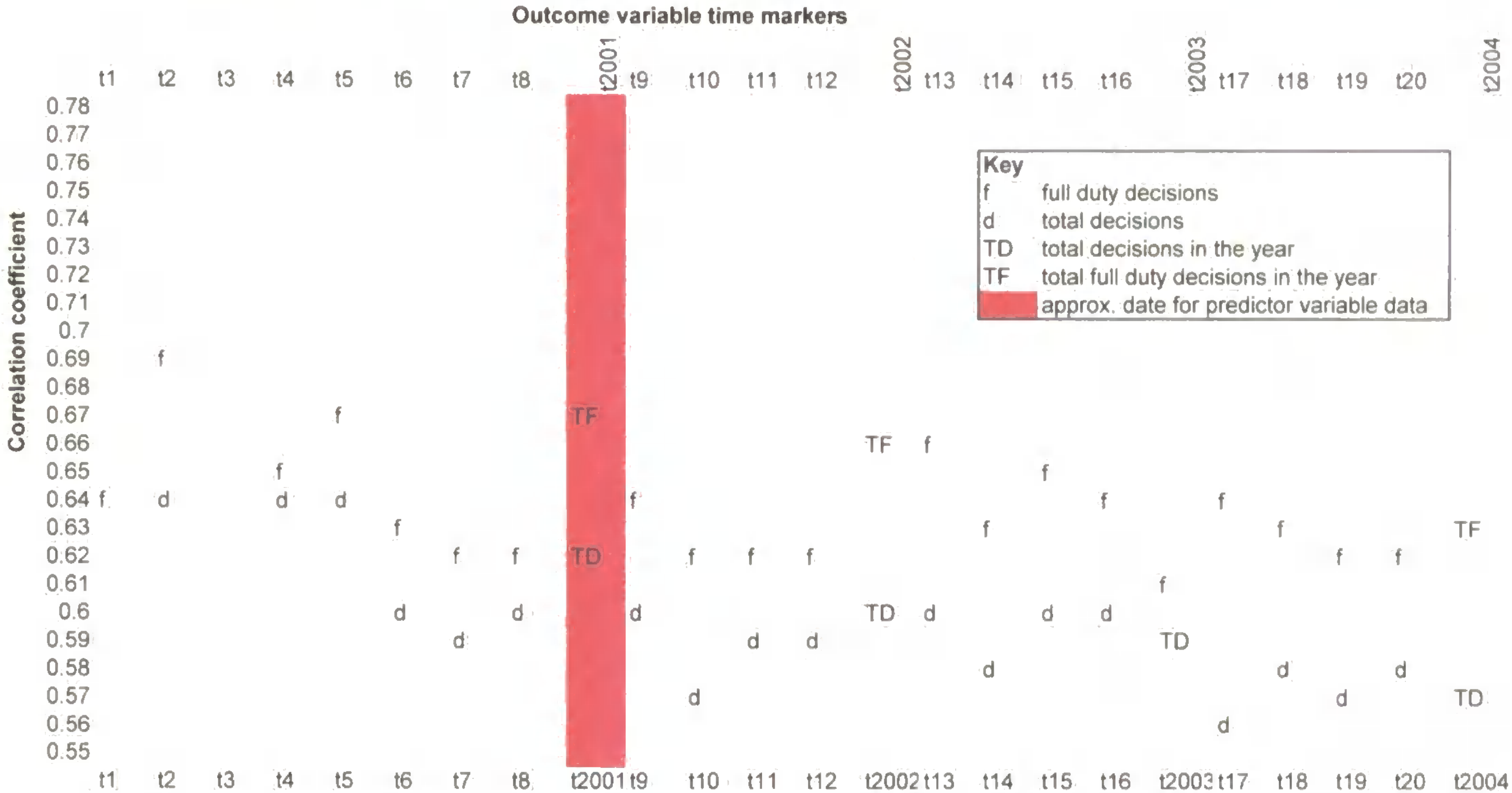


Figure 30h - Pearson's correlation coefficients for variable deinst9 and all potential outcome variables shown chronologically

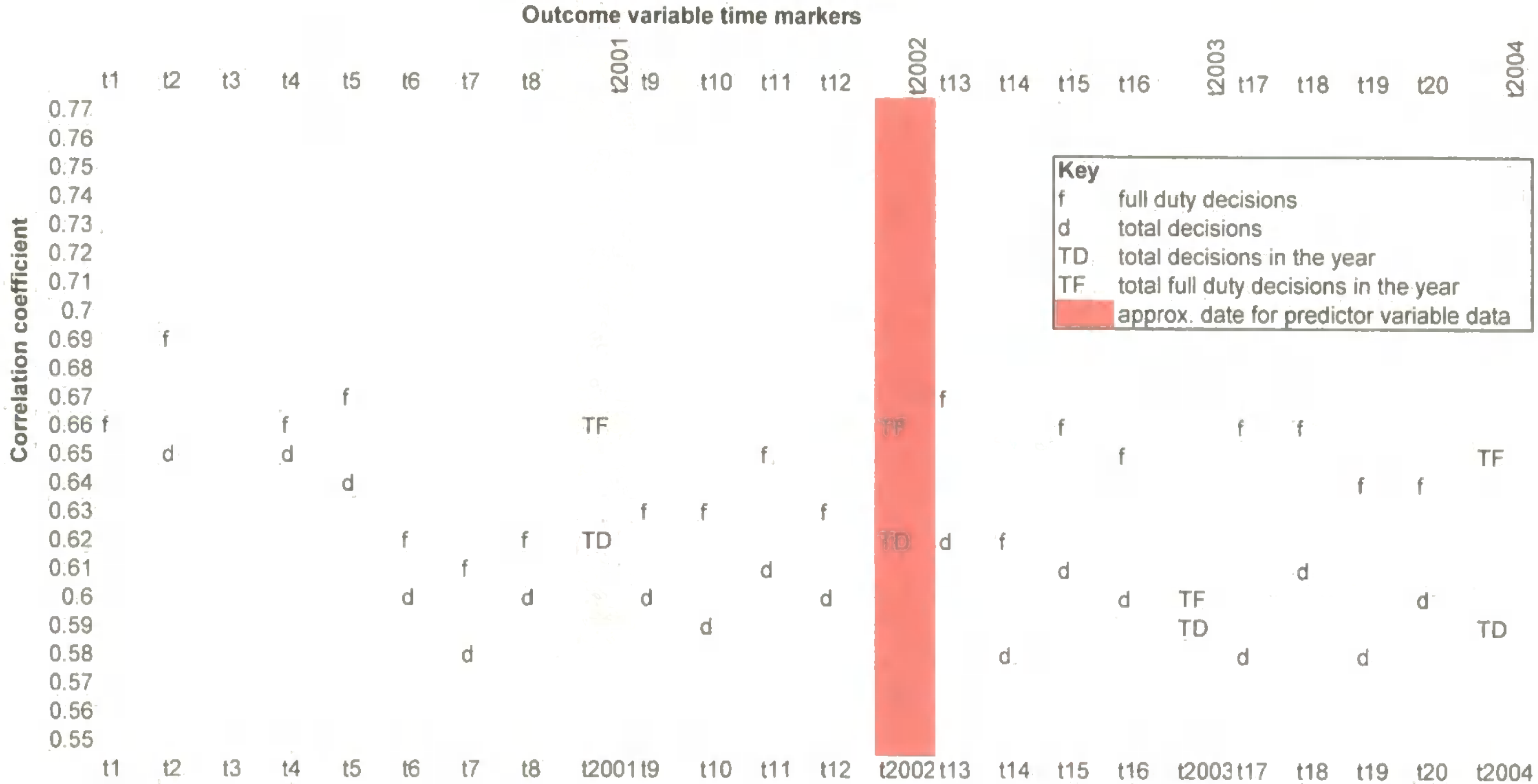


Figure 30i - Pearson's correlation coefficients for variable deinst10 and all potential outcome variables shown chronologically

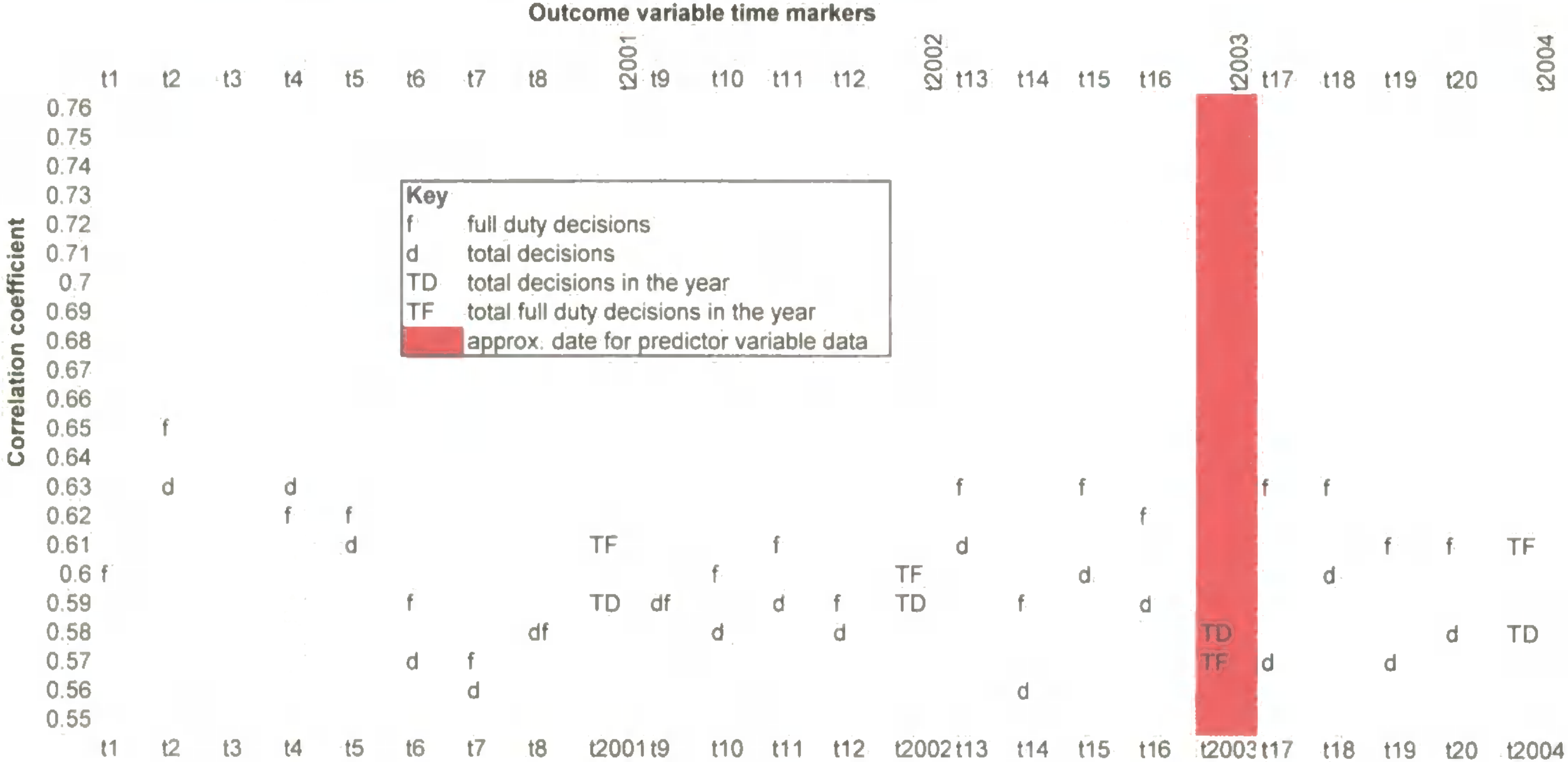


Figure 30j - Pearson's correlation coefficients for variable logdeinst15 and all potential outcome variables shown chronologically

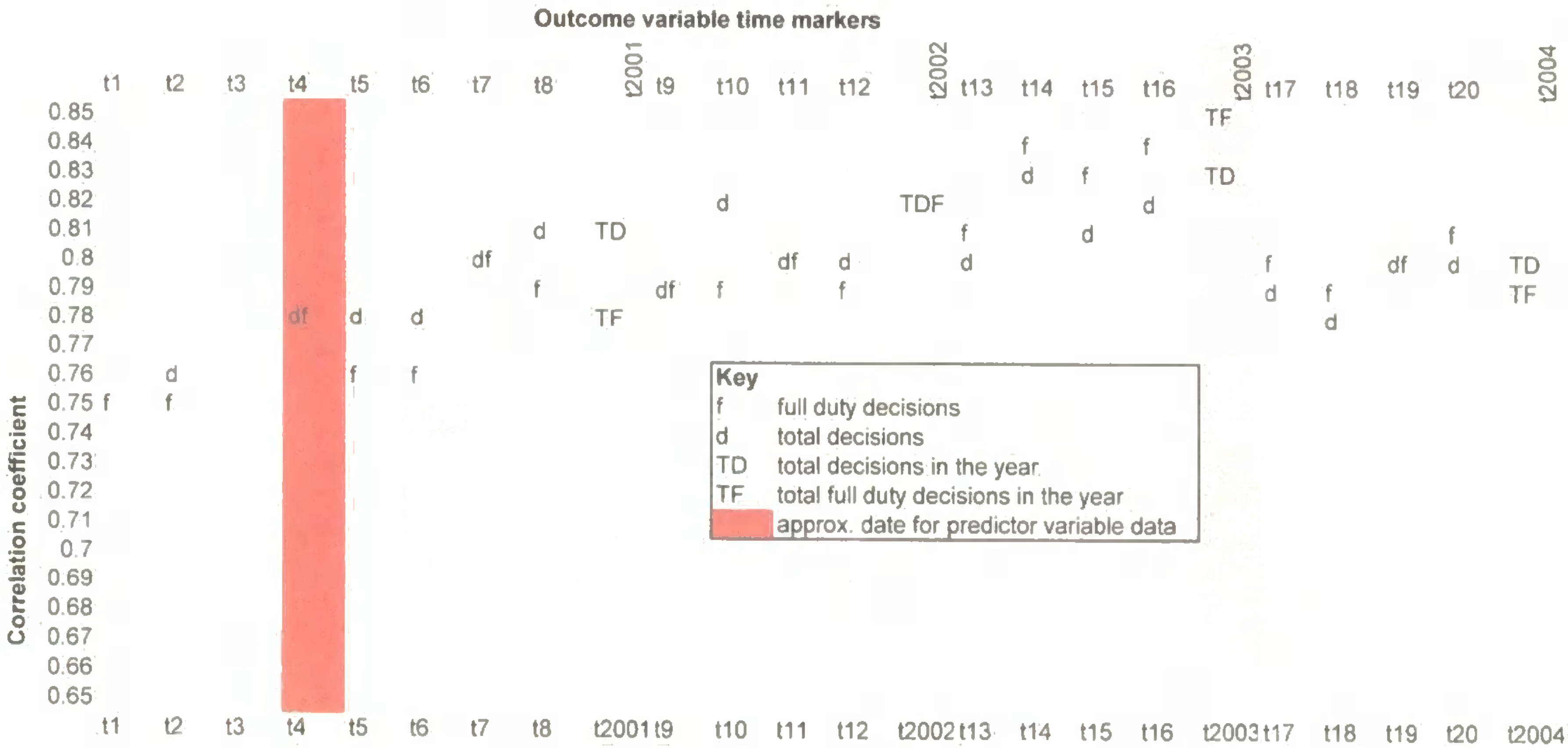


Figure 30k - Pearson's correlation coefficients for variable logdeinst16 and all potential outcome variables shown chronologically

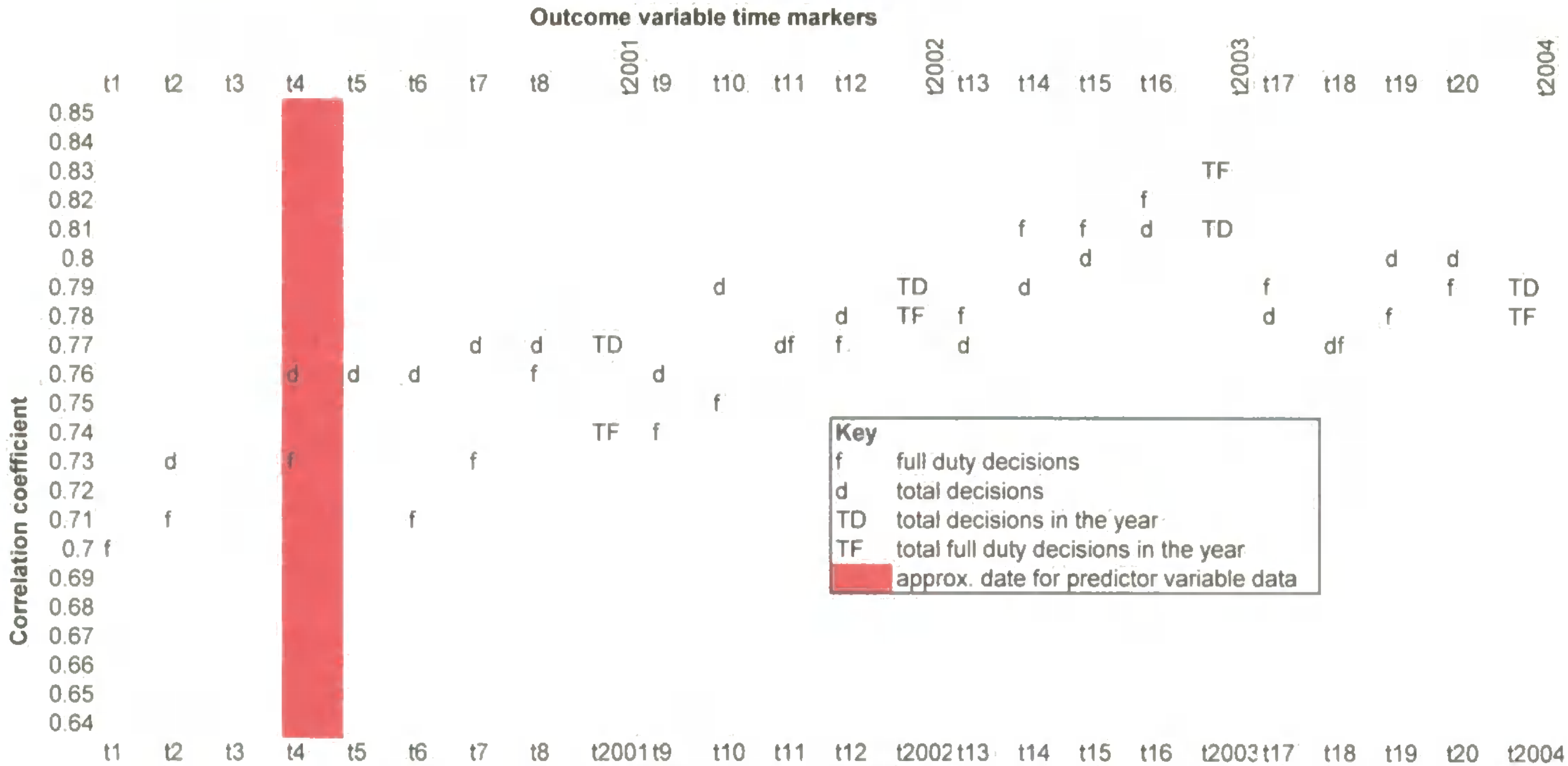


Figure 30l - Pearson's correlation coefficients for variable logdeinst17 and all potential outcome variables shown chronologically

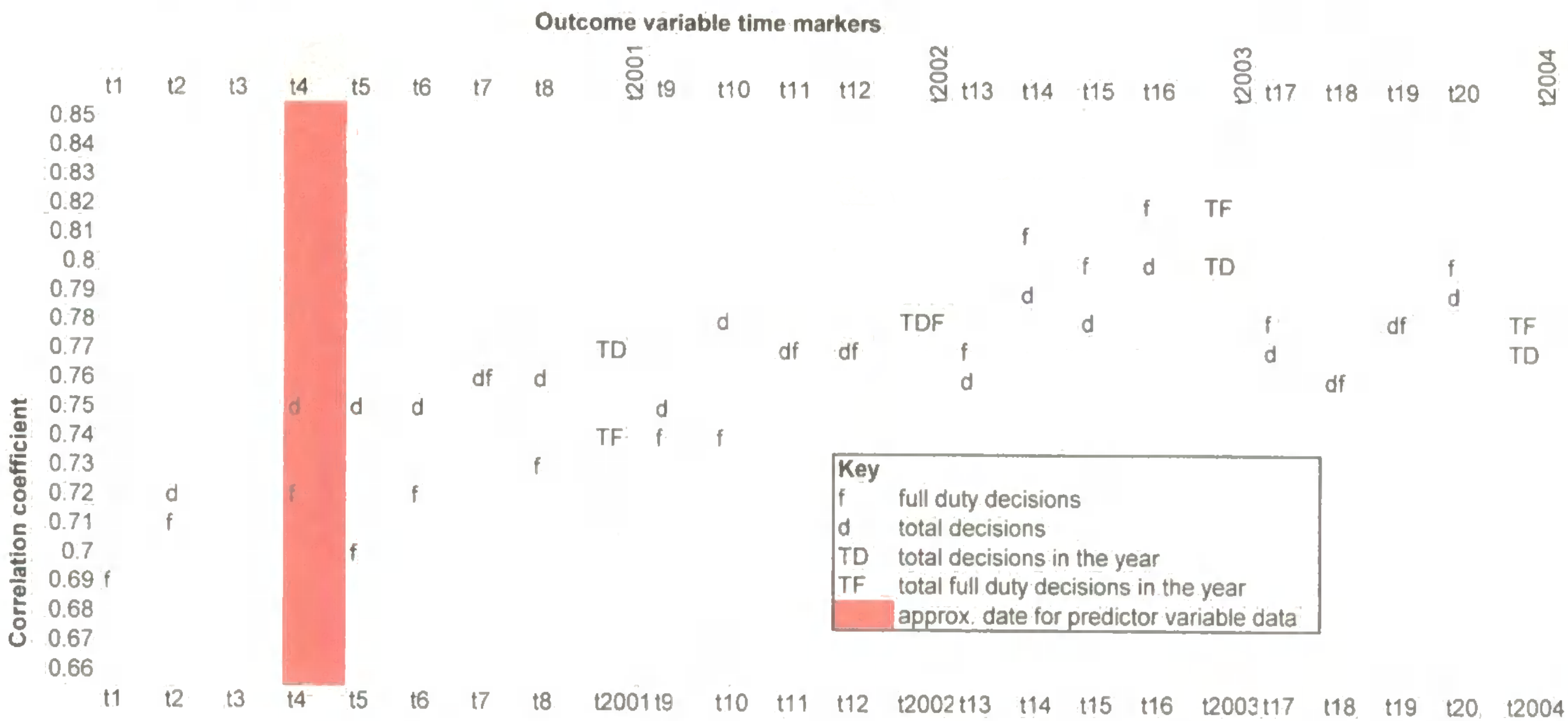


Figure 30m - Pearson's correlation coefficients for variable logdeinst18 and all potential outcome variables shown chronologically

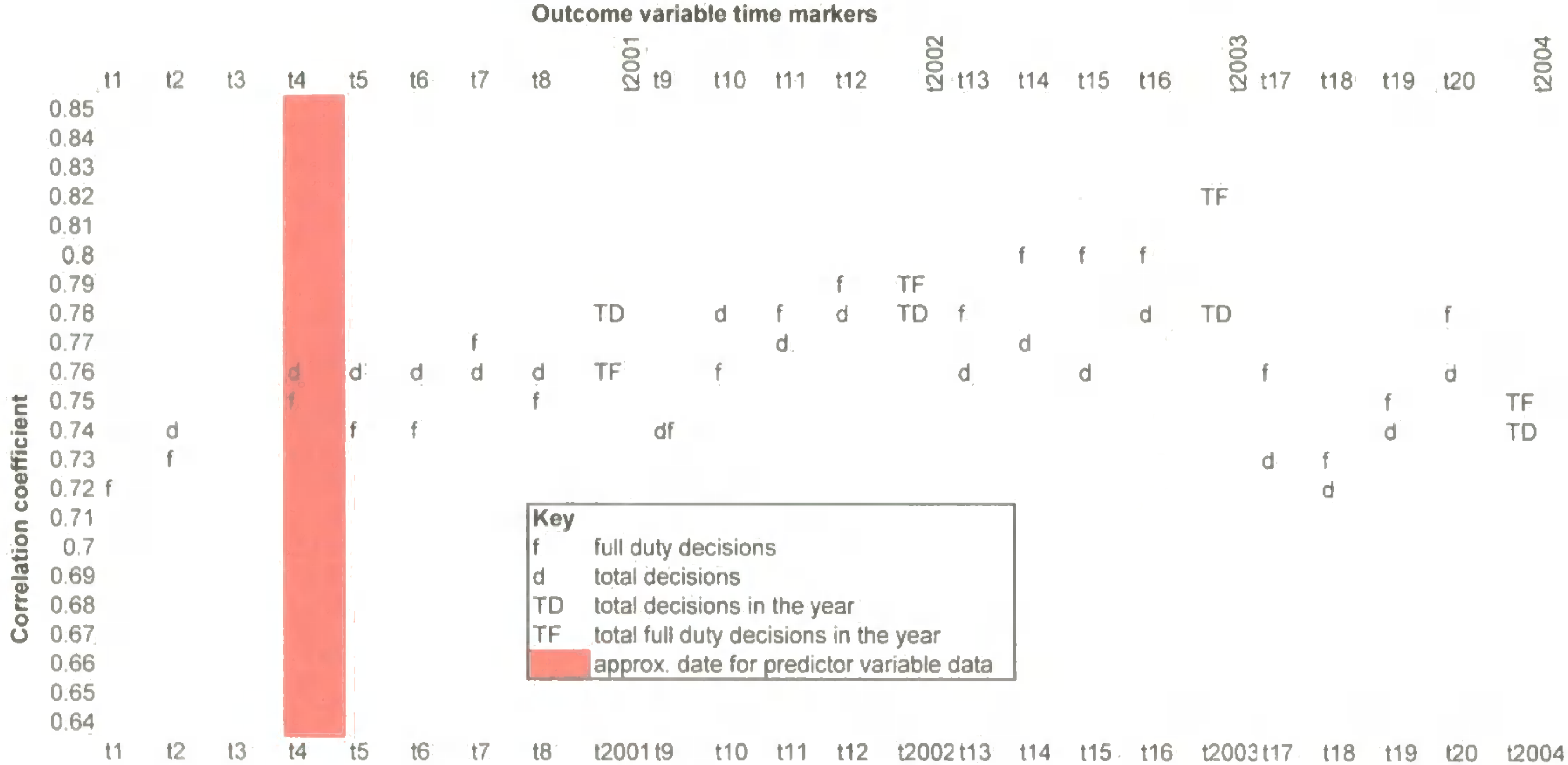


Figure 30n - Pearson's correlation coefficients for variable logdrugs1 and all potential outcome variables shown chronologically

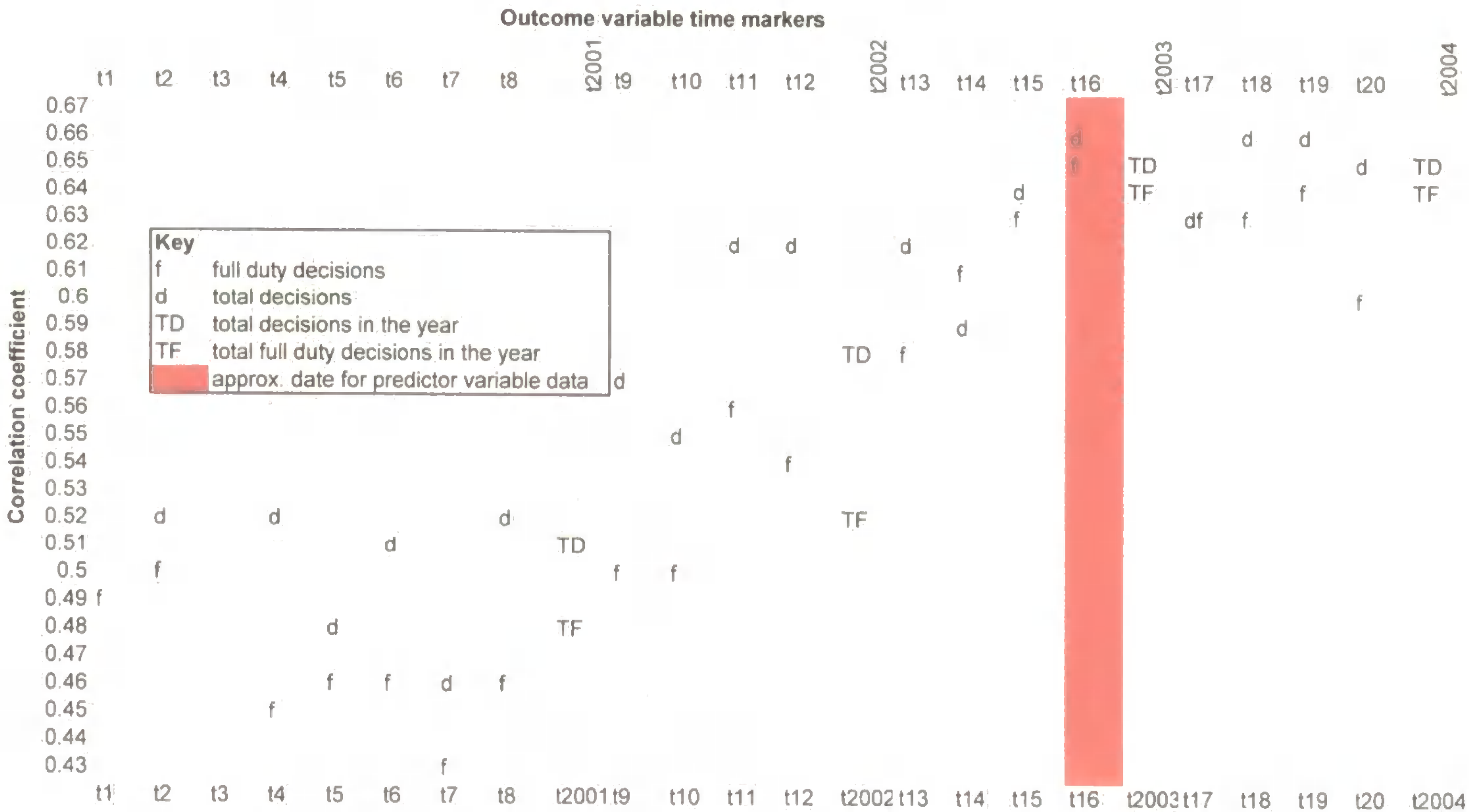


Figure 30o - Pearson's correlation coefficients for variable drugs6 and all potential outcome variables shown chronologically

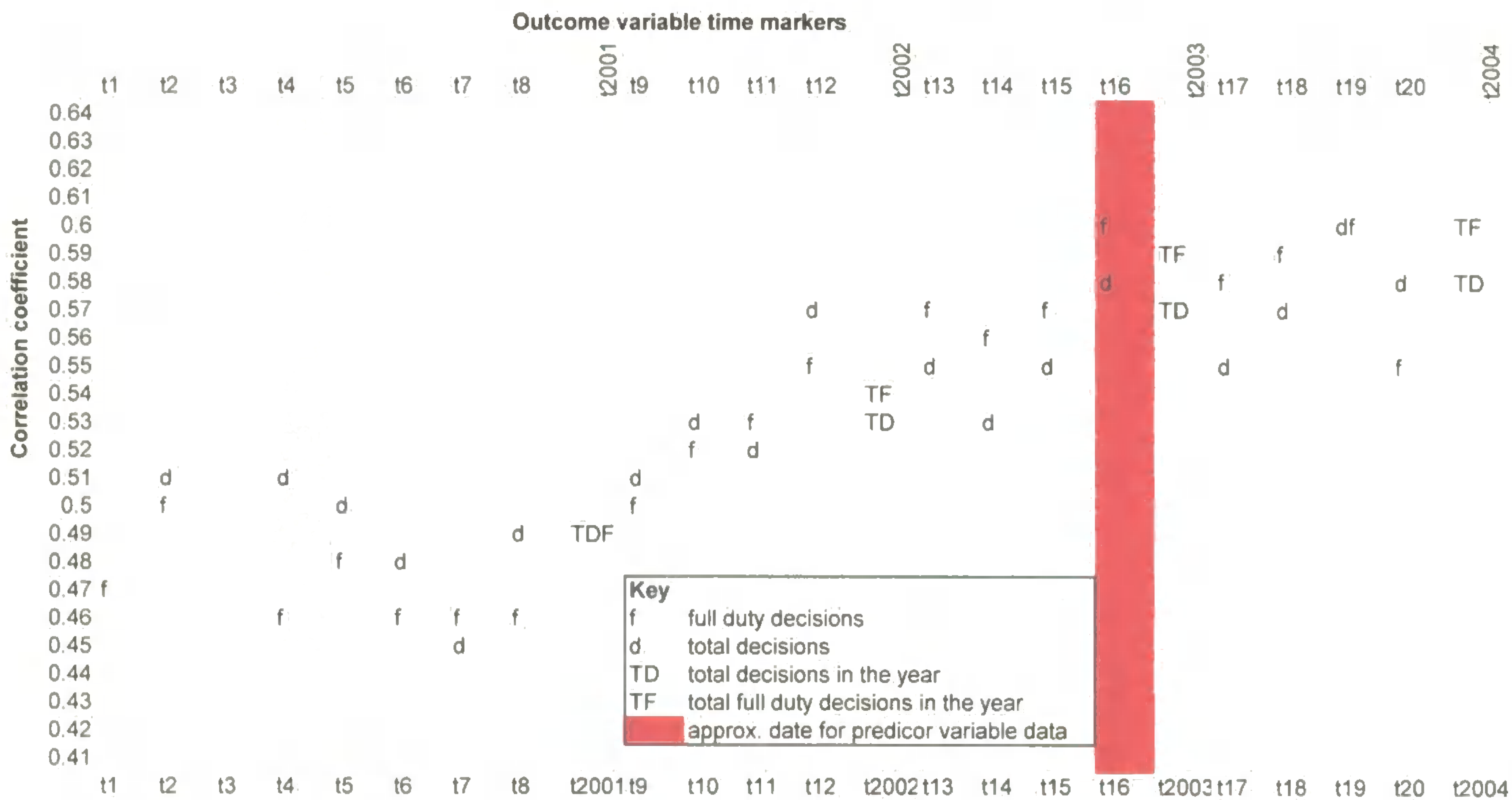


Figure 30p - Pearson's correlation coefficients for variable logethnicity2 and all potential outcome variables shown chronologically

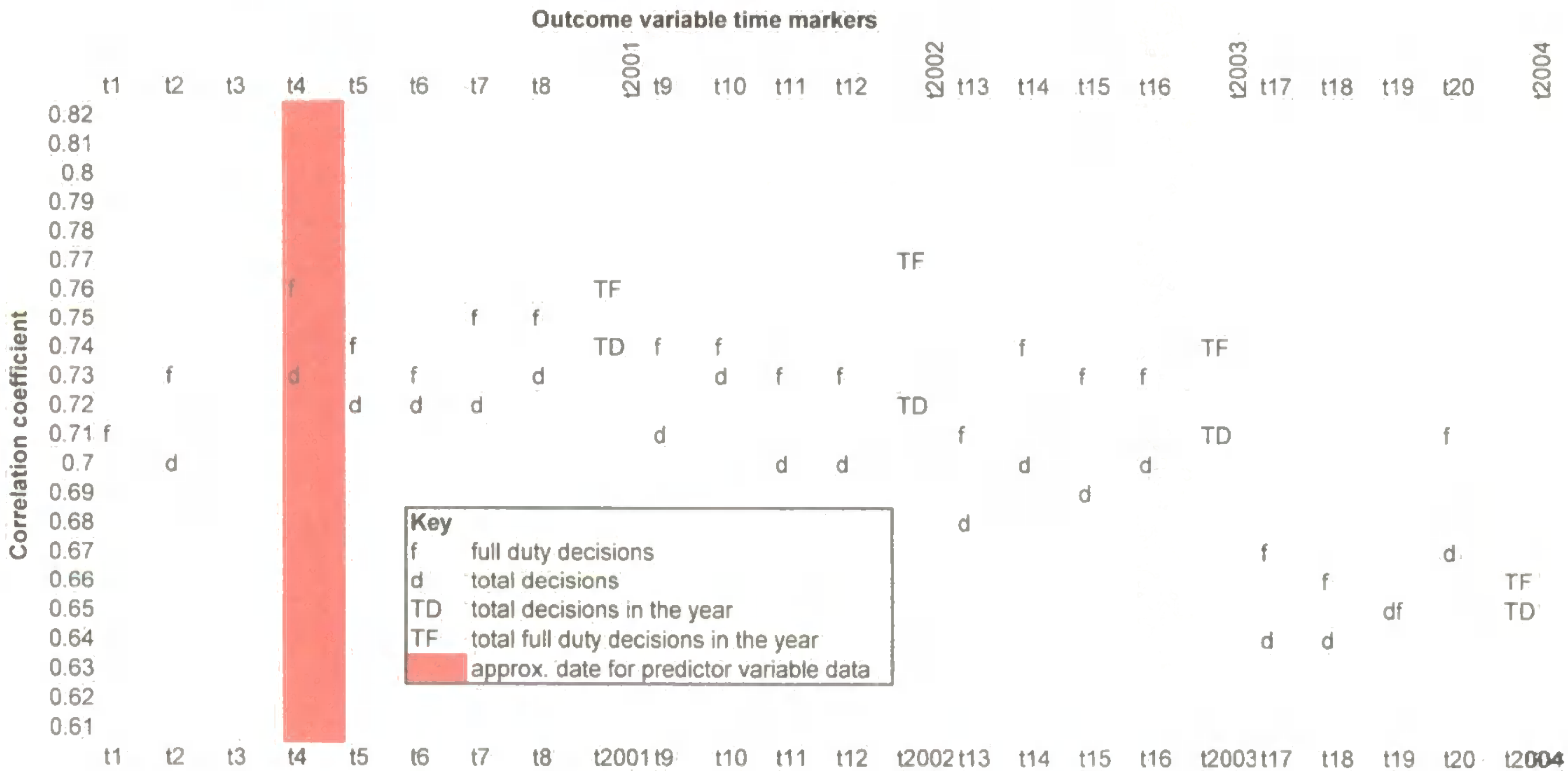


Figure 30q - Pearson's correlation coefficients for variable gen2 and all potential outcome variables shown chronologically

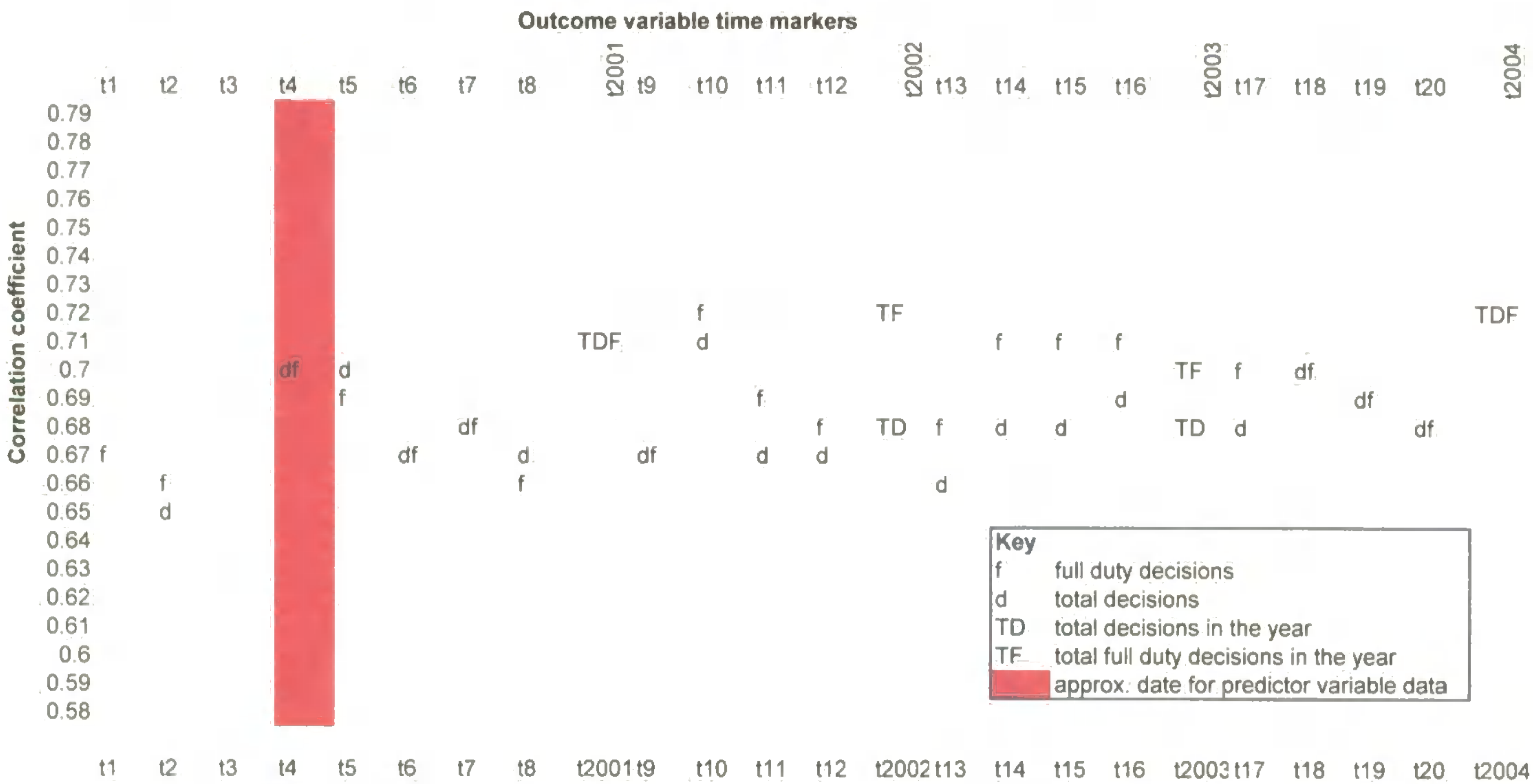


Figure 30r - Pearson's correlation coefficients for variable gen3 and all potential outcome variables shown chronologically

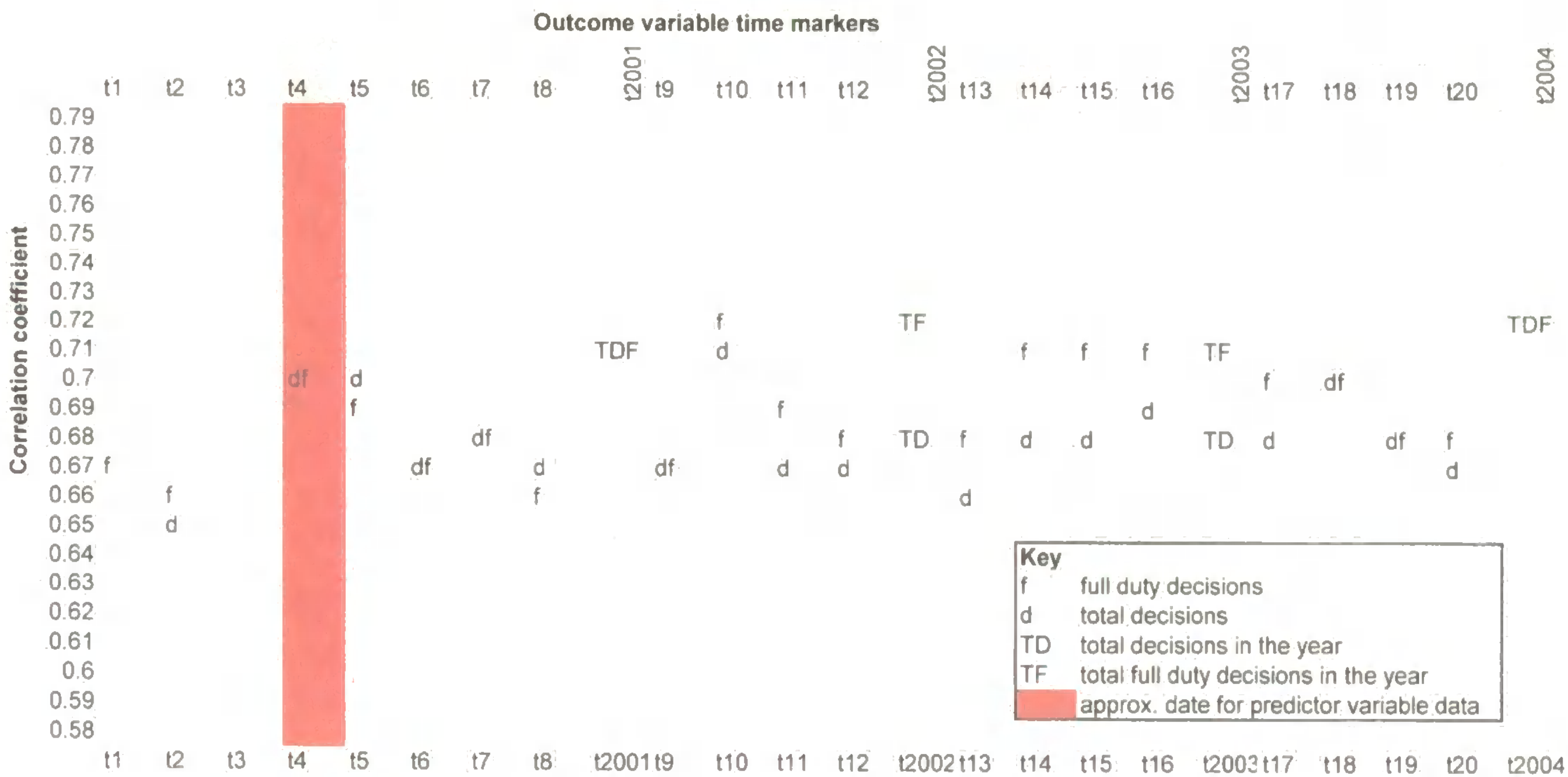


Figure 30s - Pearson's correlation coefficients for variable gen4 and all potential outcome variables shown chronologically

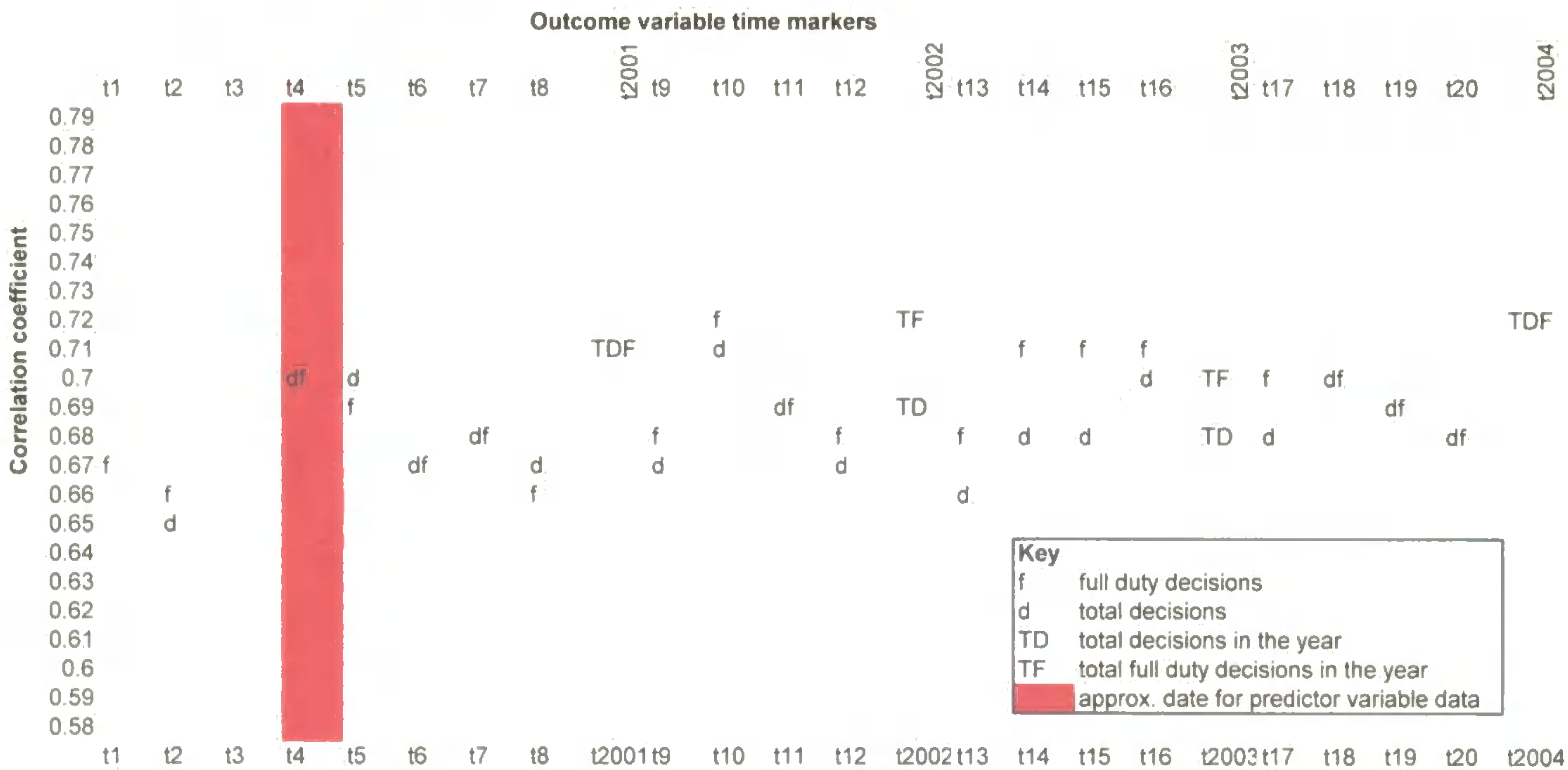


Figure 30t - Pearson's correlation coefficients for variable migration2 and all potential outcome variables shown chronologically

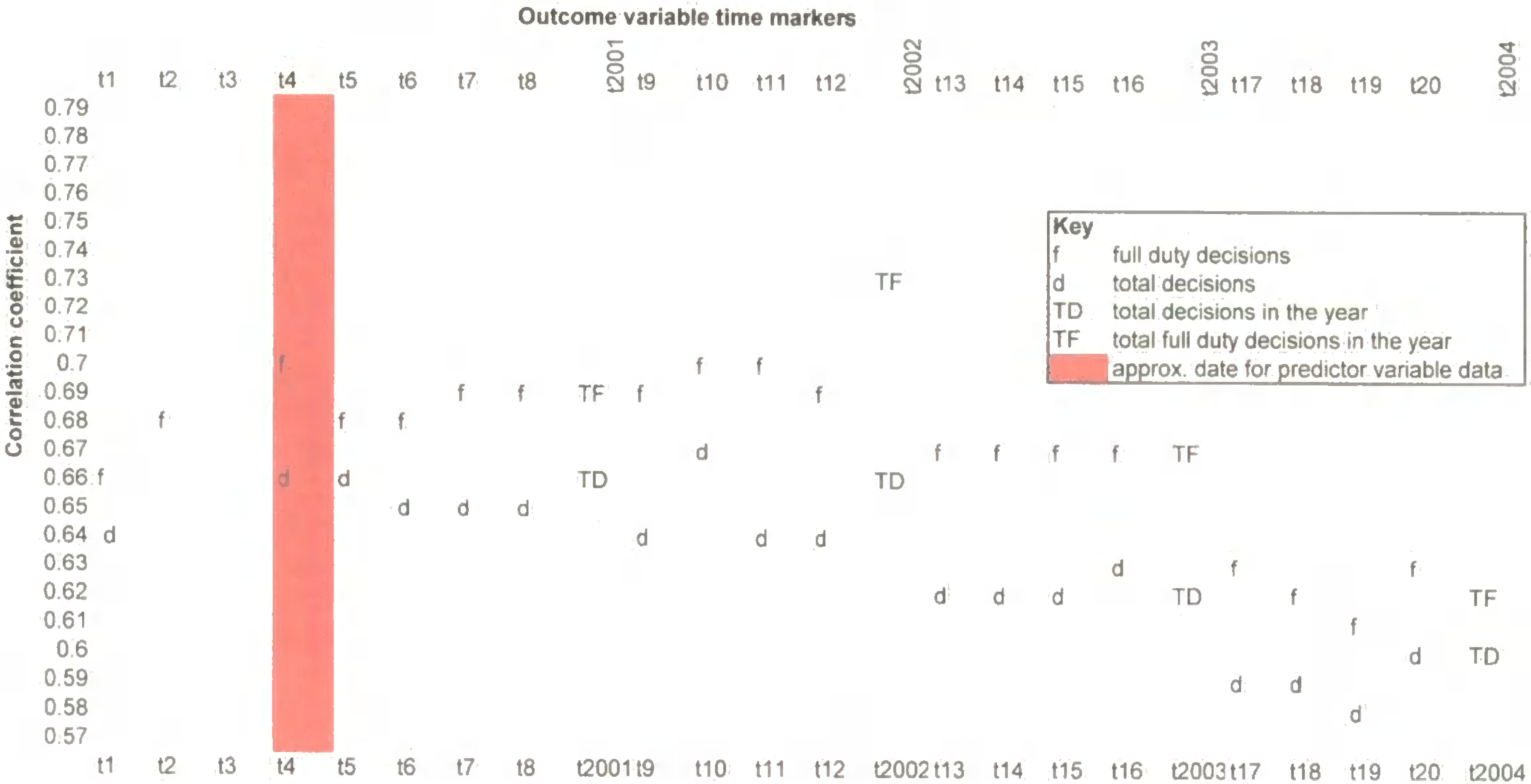


Figure 30u - Pearson's correlation coefficients for variable logpoorhealth1 and all potential outcome variables shown chronologically

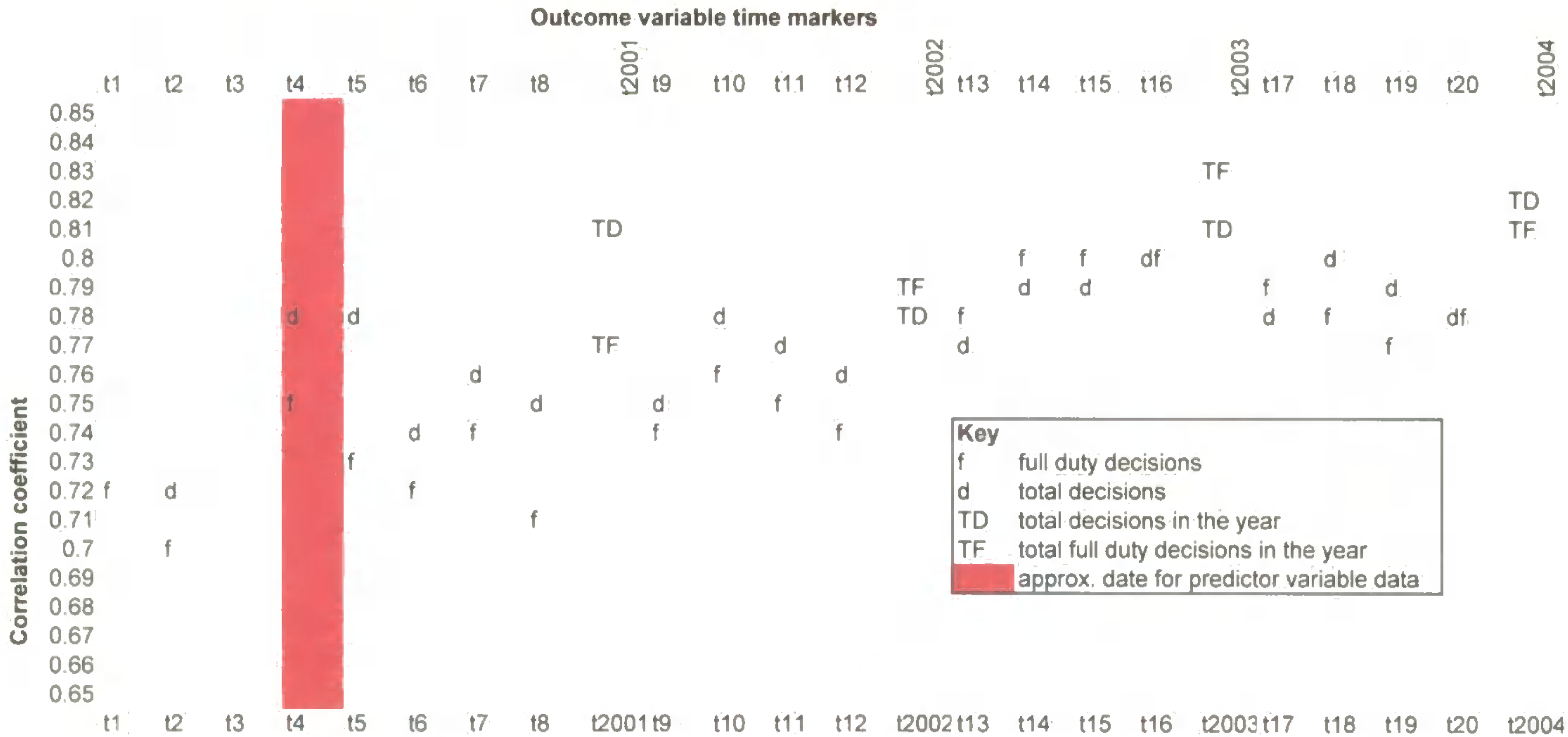


Figure 30v - Pearson's correlation coefficients for variable poorhealth2 and all potential outcome variables shown chronologically

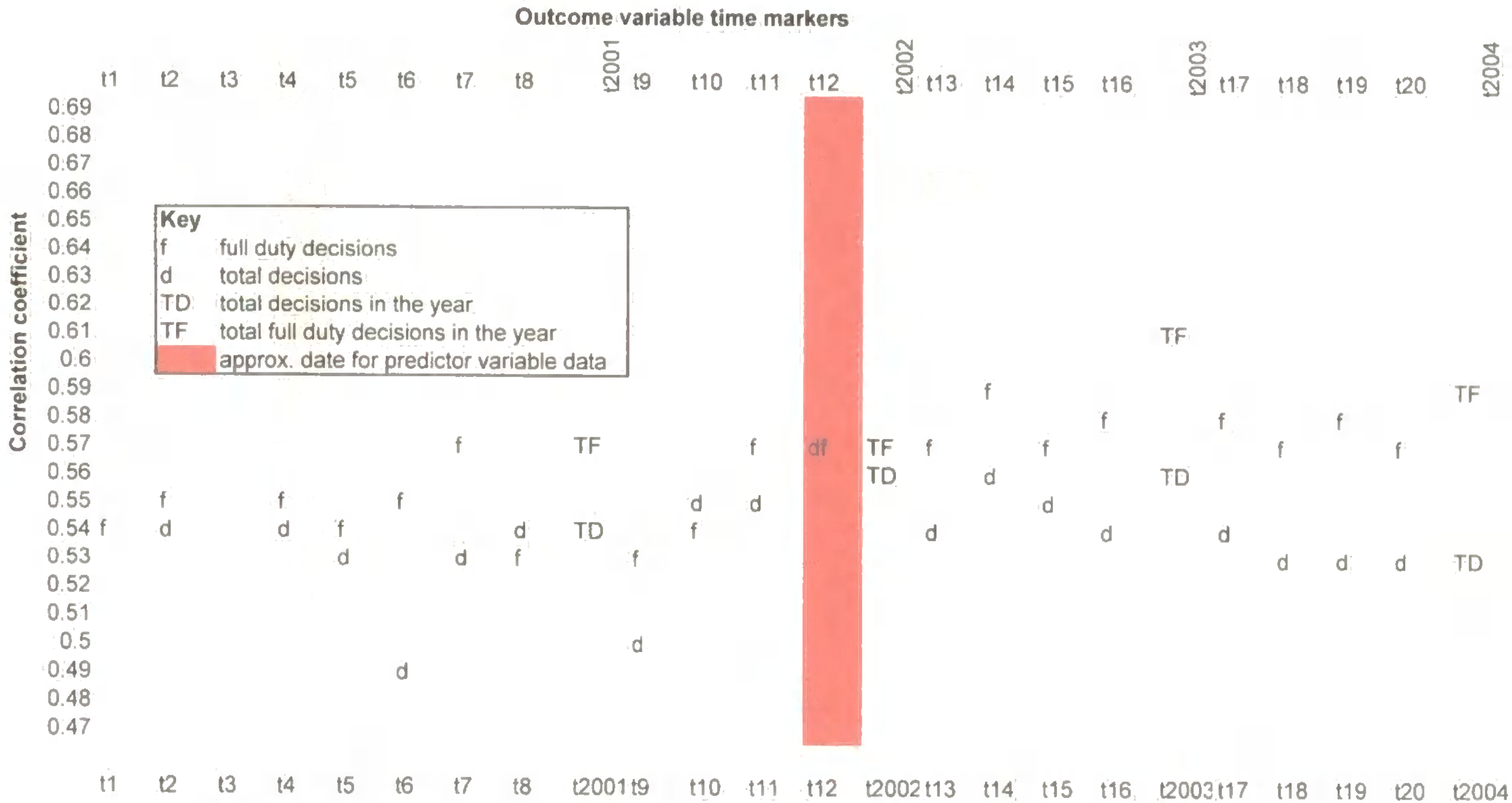


Figure 30w - Pearson's correlation coefficients for variable poorhealth3 and all potential outcome variables shown chronologically

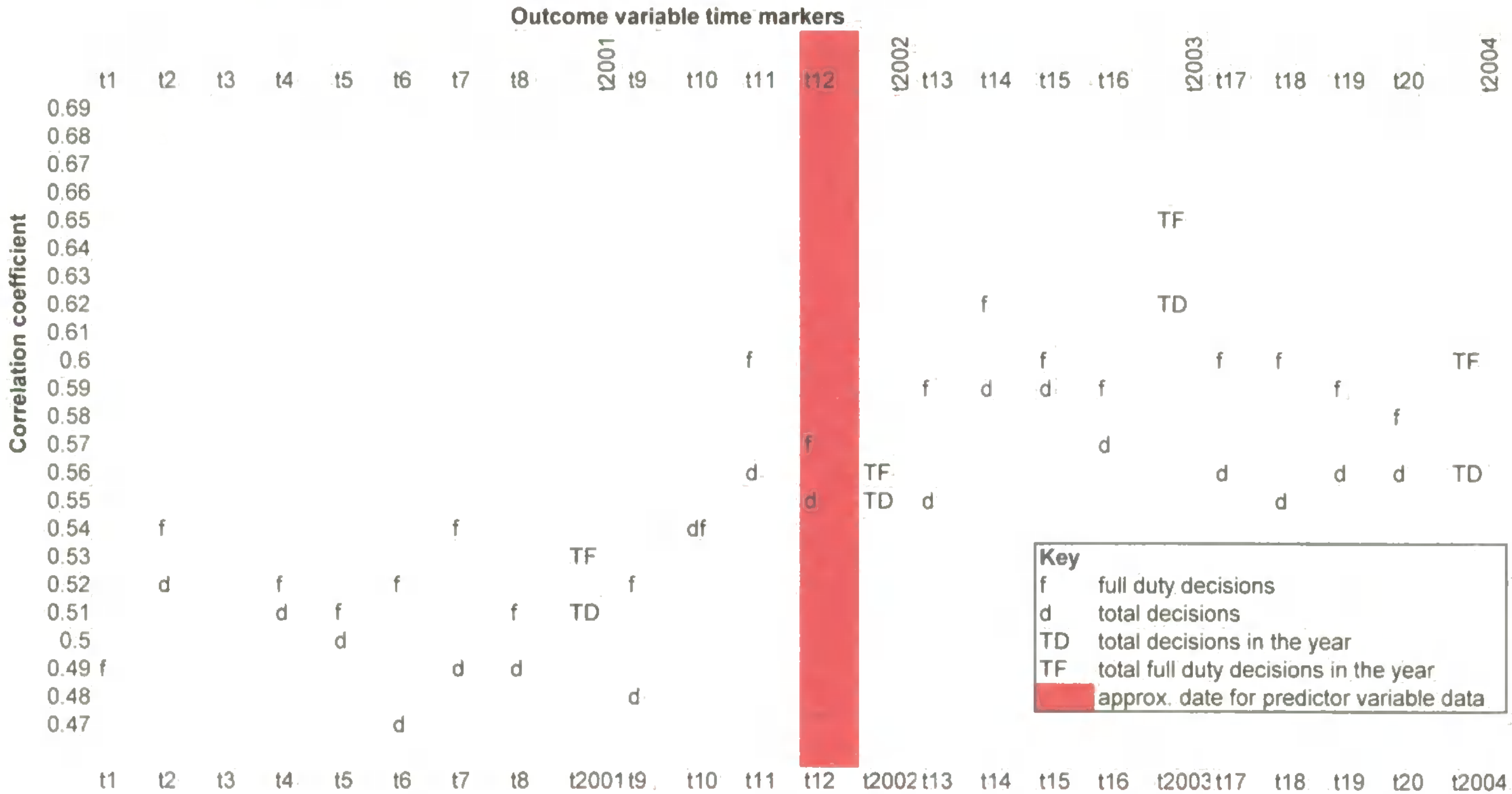


Figure 30x - Pearson's correlation coefficients for variable poverty1 and all potential outcome variables shown chronologically

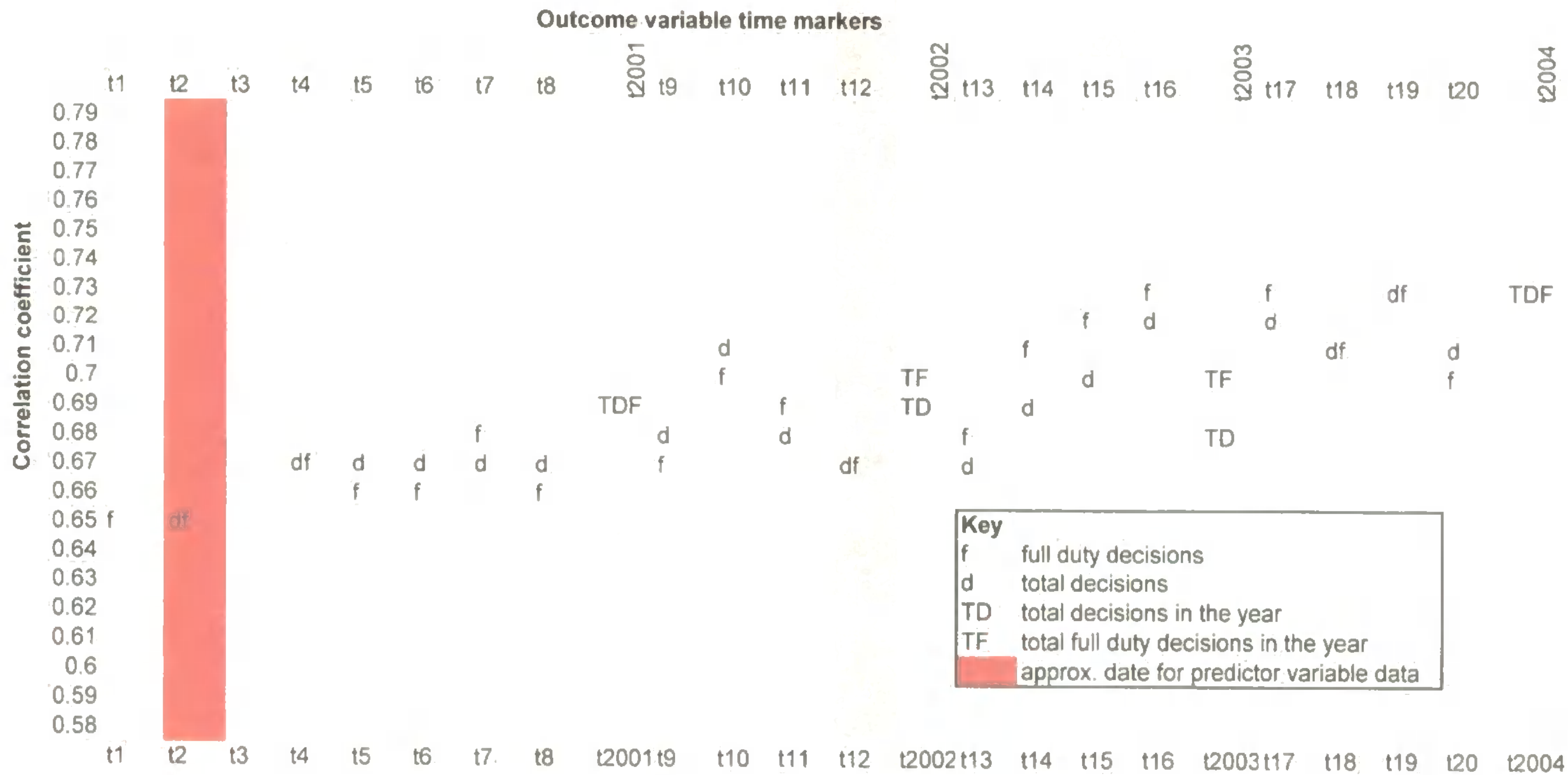


Figure 30y - Pearson's correlation coefficients for variable logpoverty2 and all potential outcome variables shown chronologically

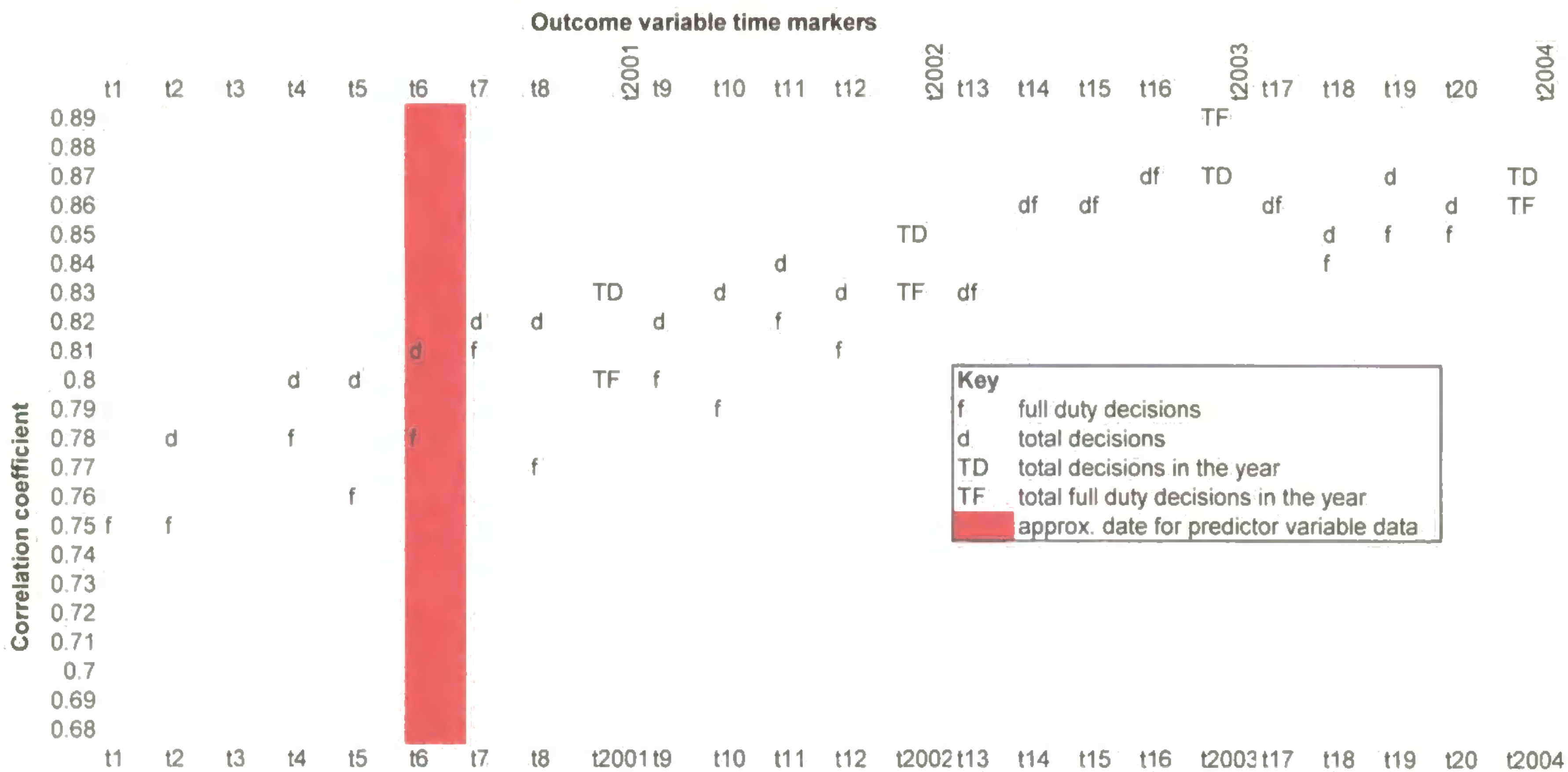


Figure 30z - Pearson's correlation coefficients for variable logpoverty3 and all potential outcome variables shown chronologically

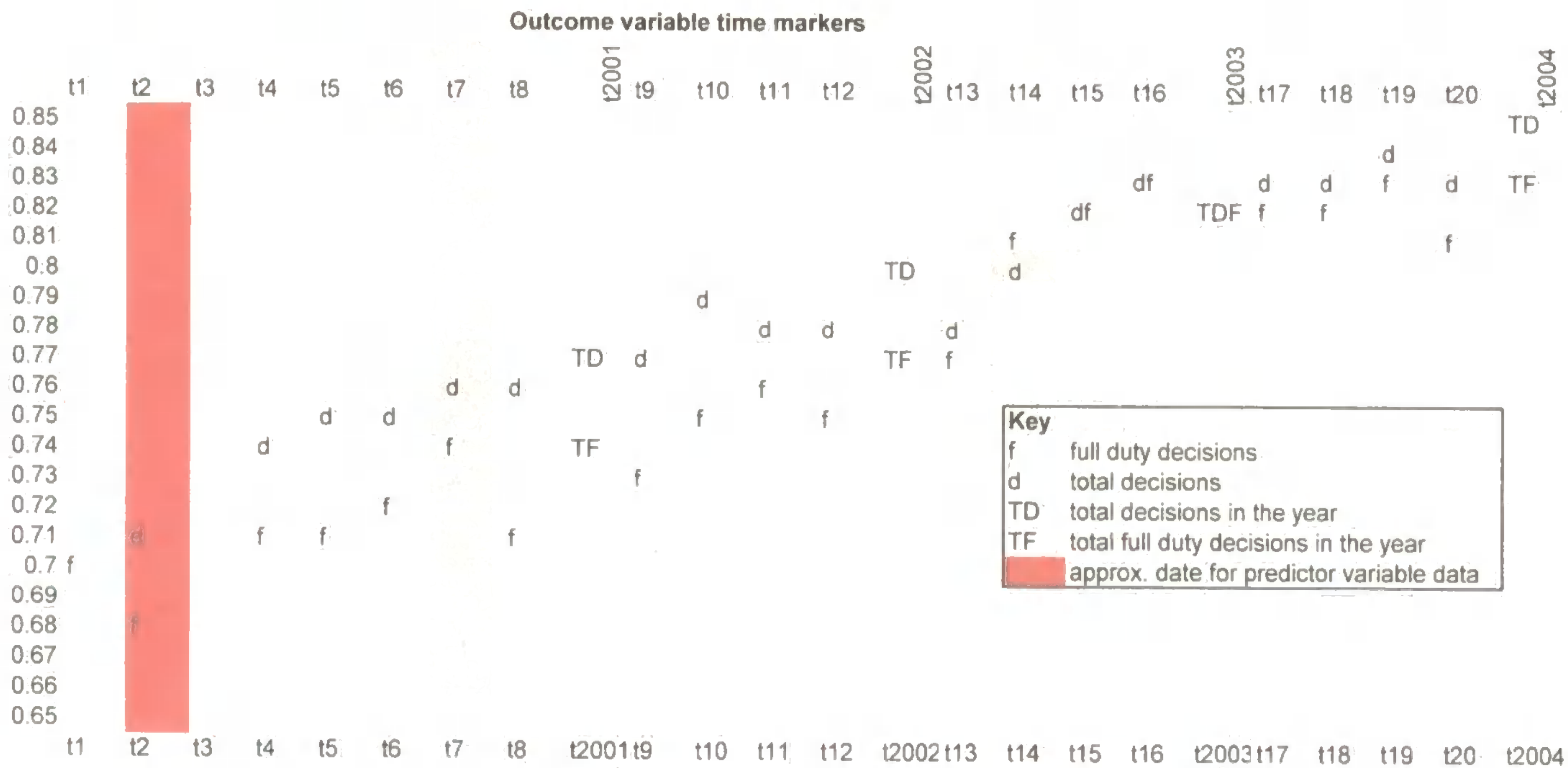


Figure 30aa - Pearson's correlation coefficients for variable logpoverty4 and all potential outcome variables shown chronologically

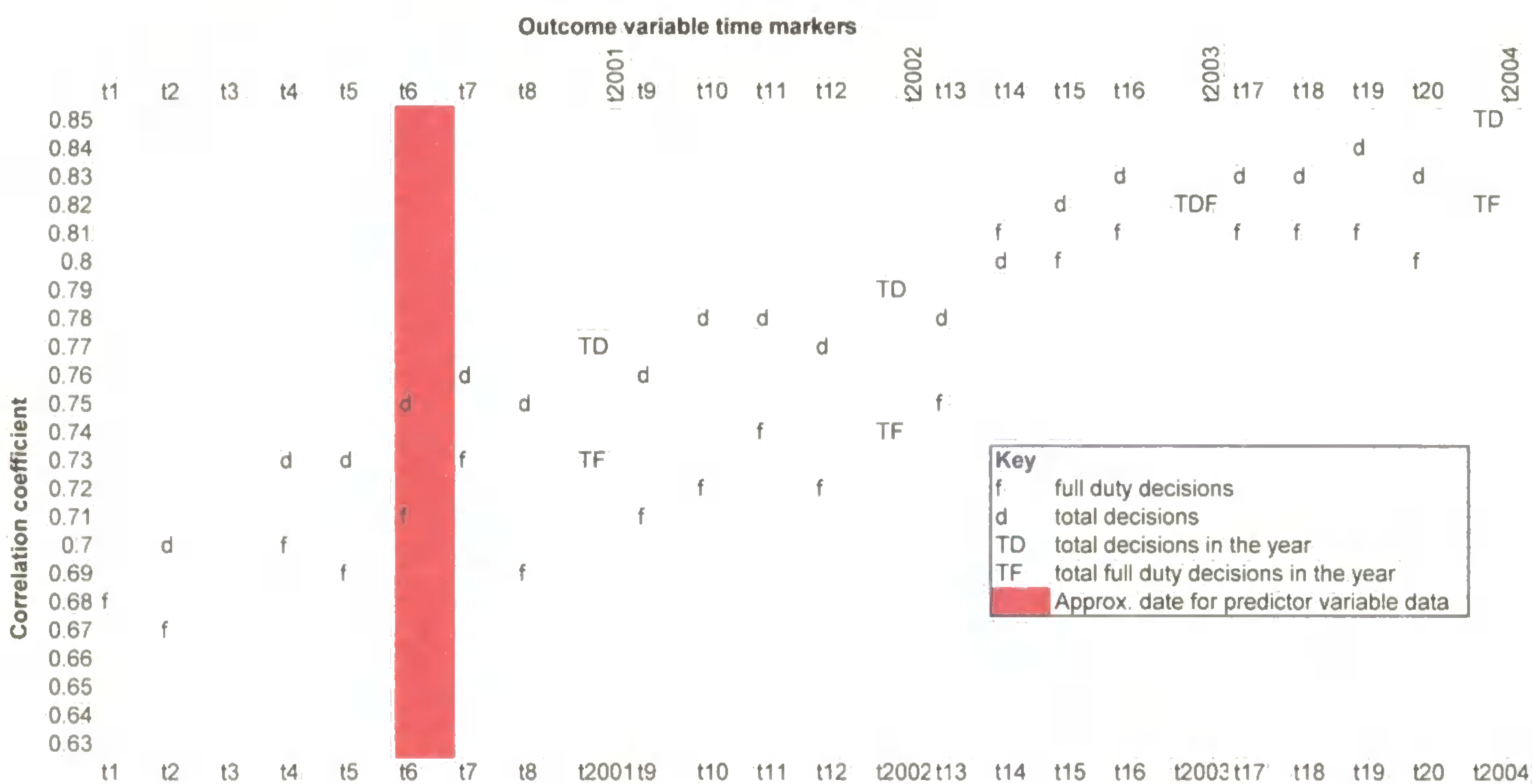


Figure 30ab - Pearson's correlation coefficients for variable logpoverty5 and all potential outcome variables shown chronologically

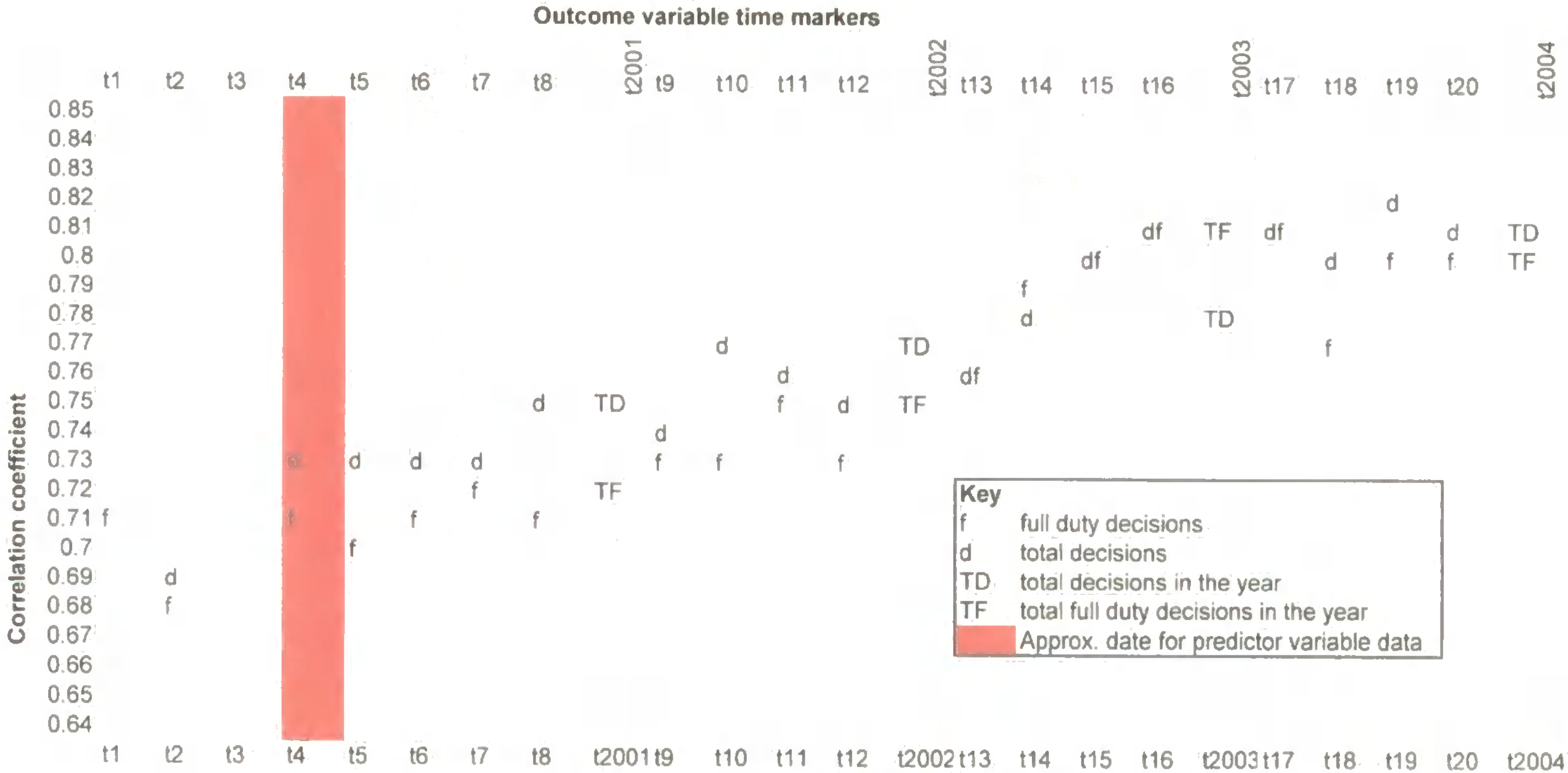


Figure 30ac - Pearson's correlation coefficients for variable poverty6 and all potential outcome variables shown chronologically

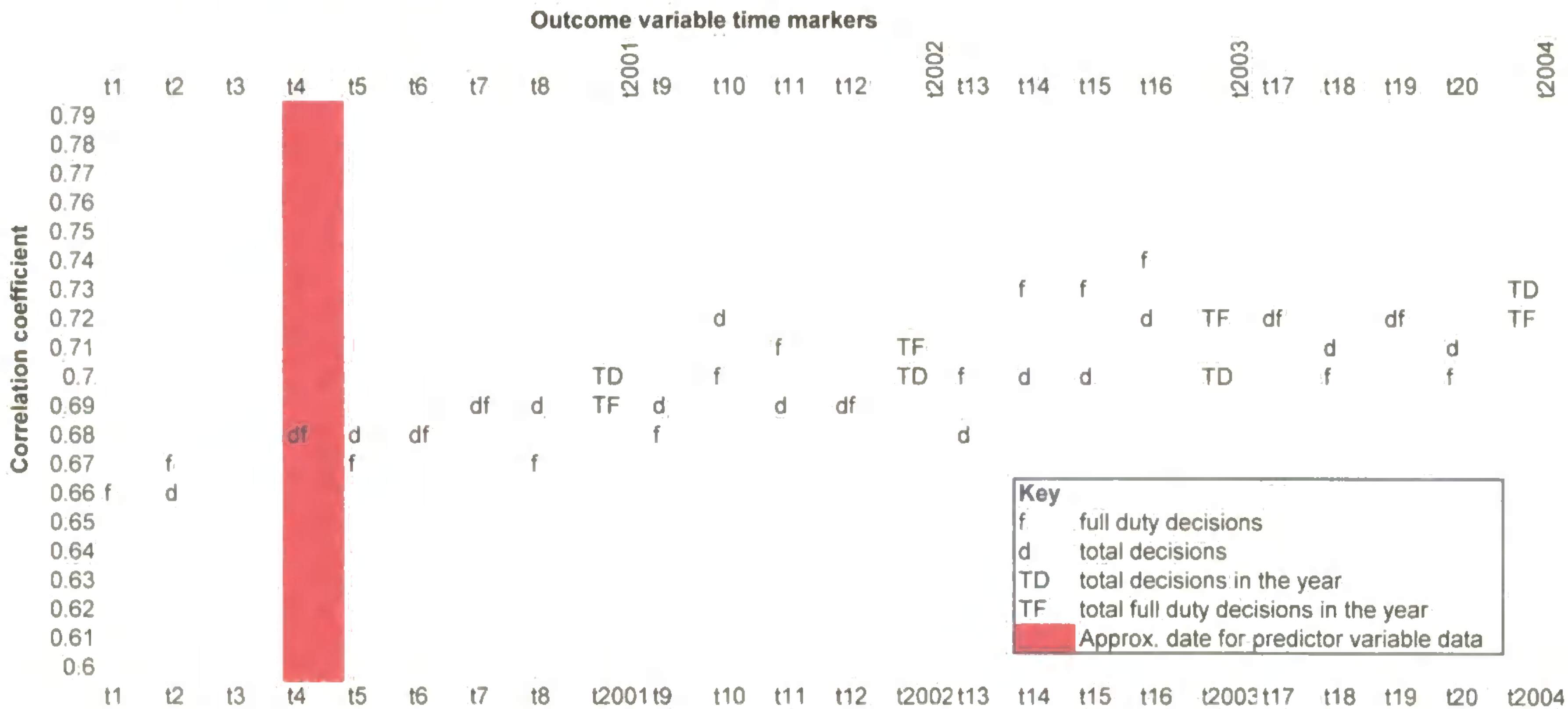


Figure 30ad - Pearson's correlation coefficients for variable logrelationship1 and all potential outcome variables shown chronologically

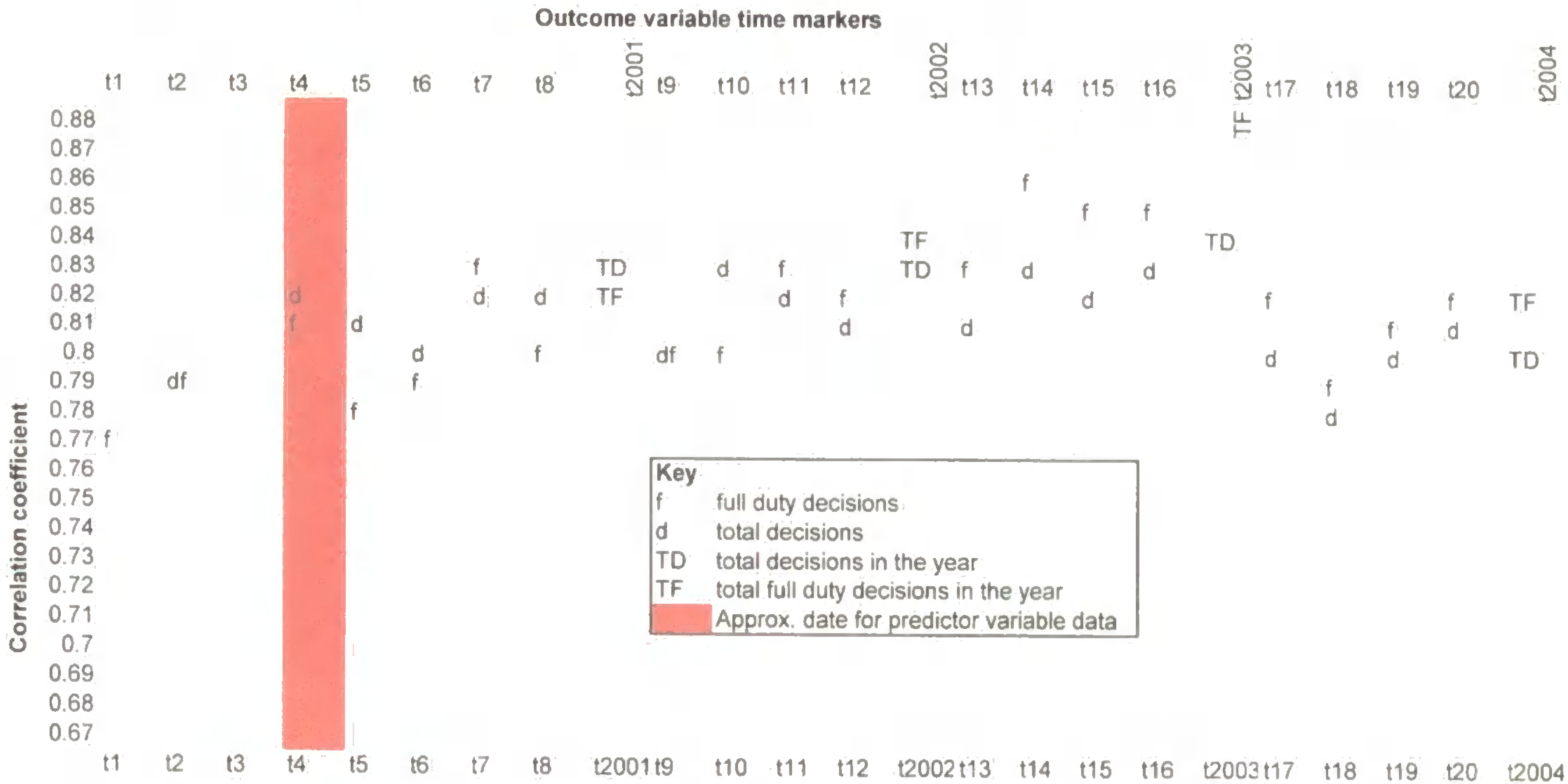


Figure 30ae - Pearson's correlation coefficients for variable relationship2 and all potential outcome variables shown chronologically

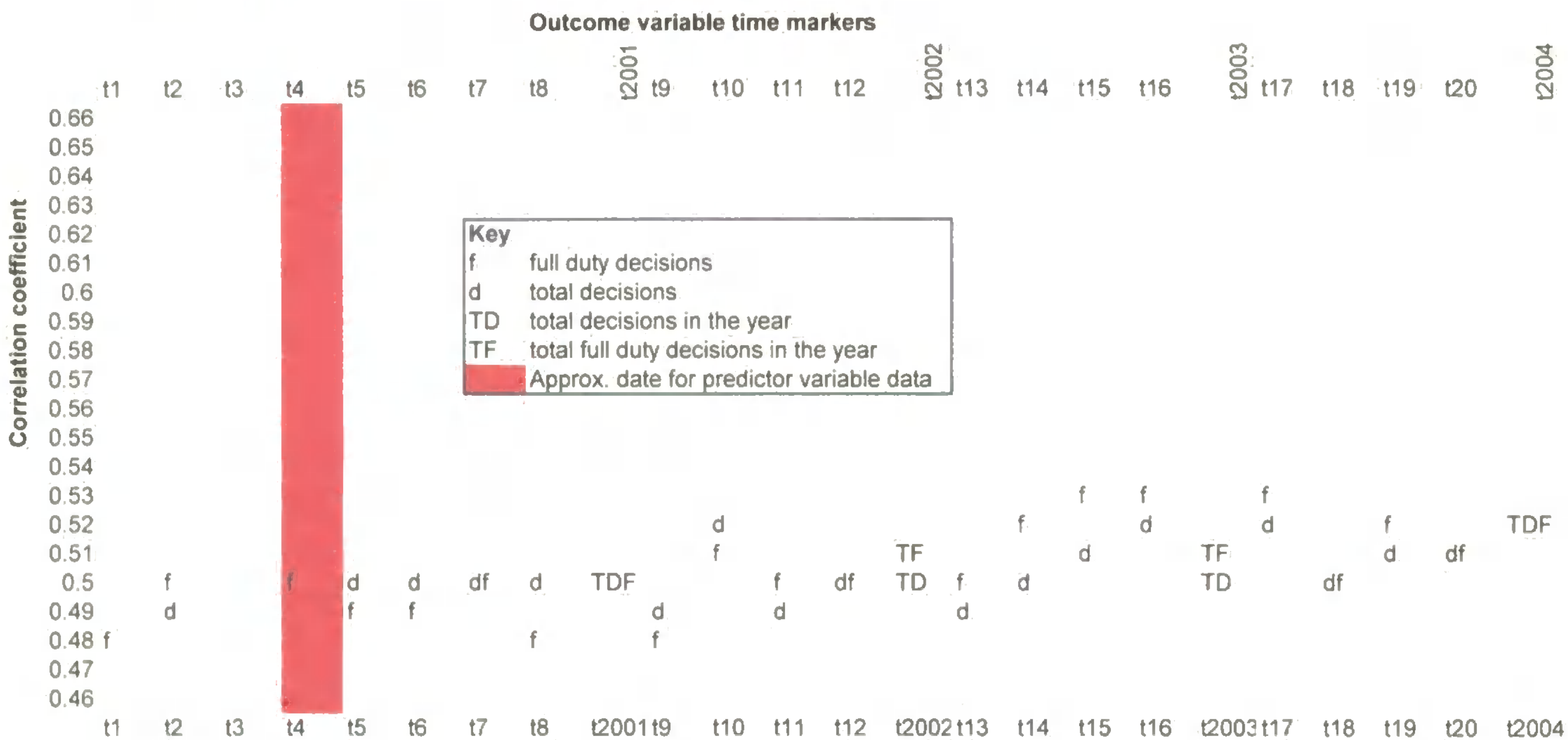
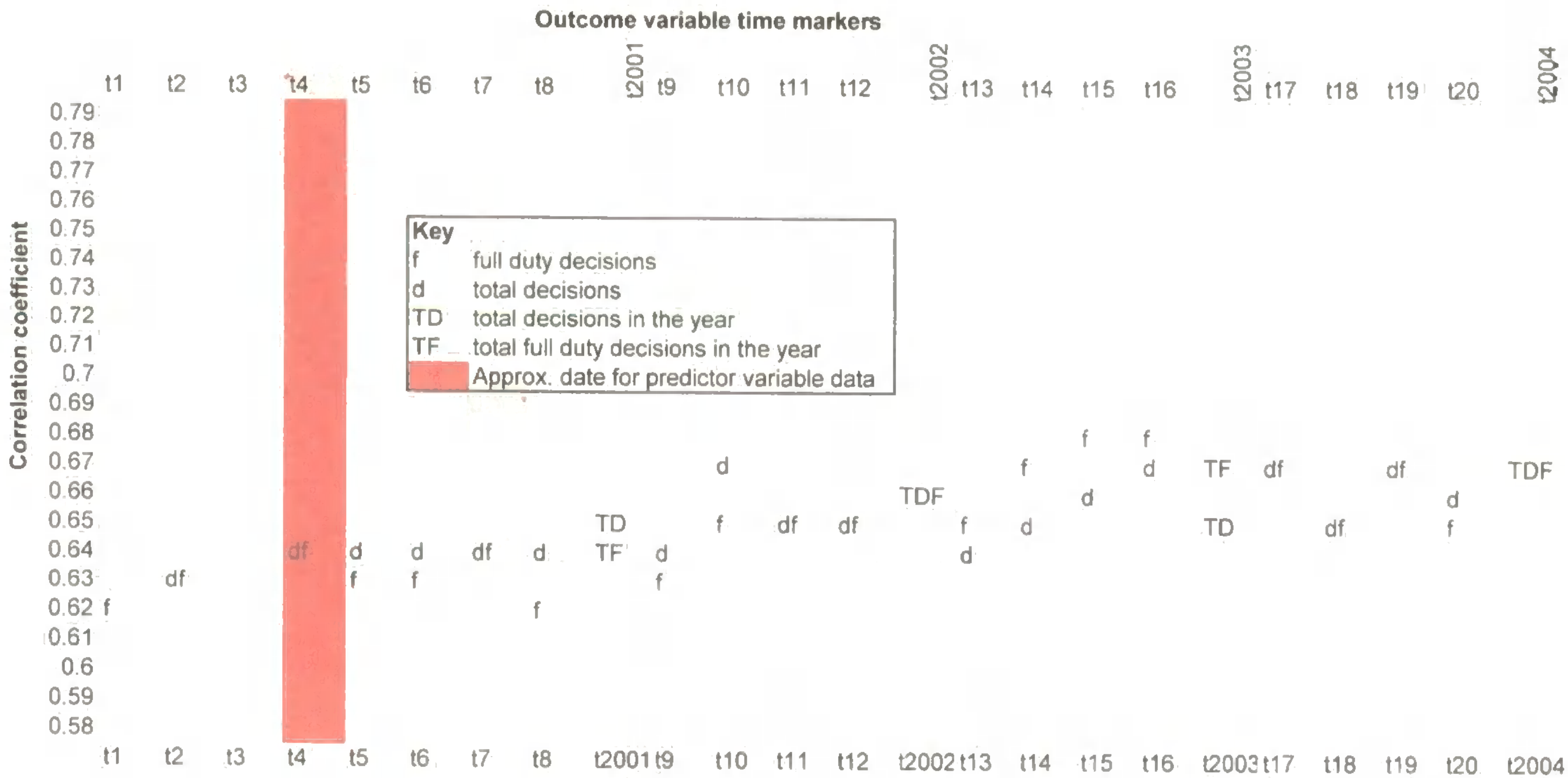


Figure 30af - Pearson's correlation coefficients for variable relationship4 and all potential outcome variables shown chronologically



500

Figure 30ag - Pearson's correlation coefficients for variable relationship5 and all potential outcome variables shown chronologically

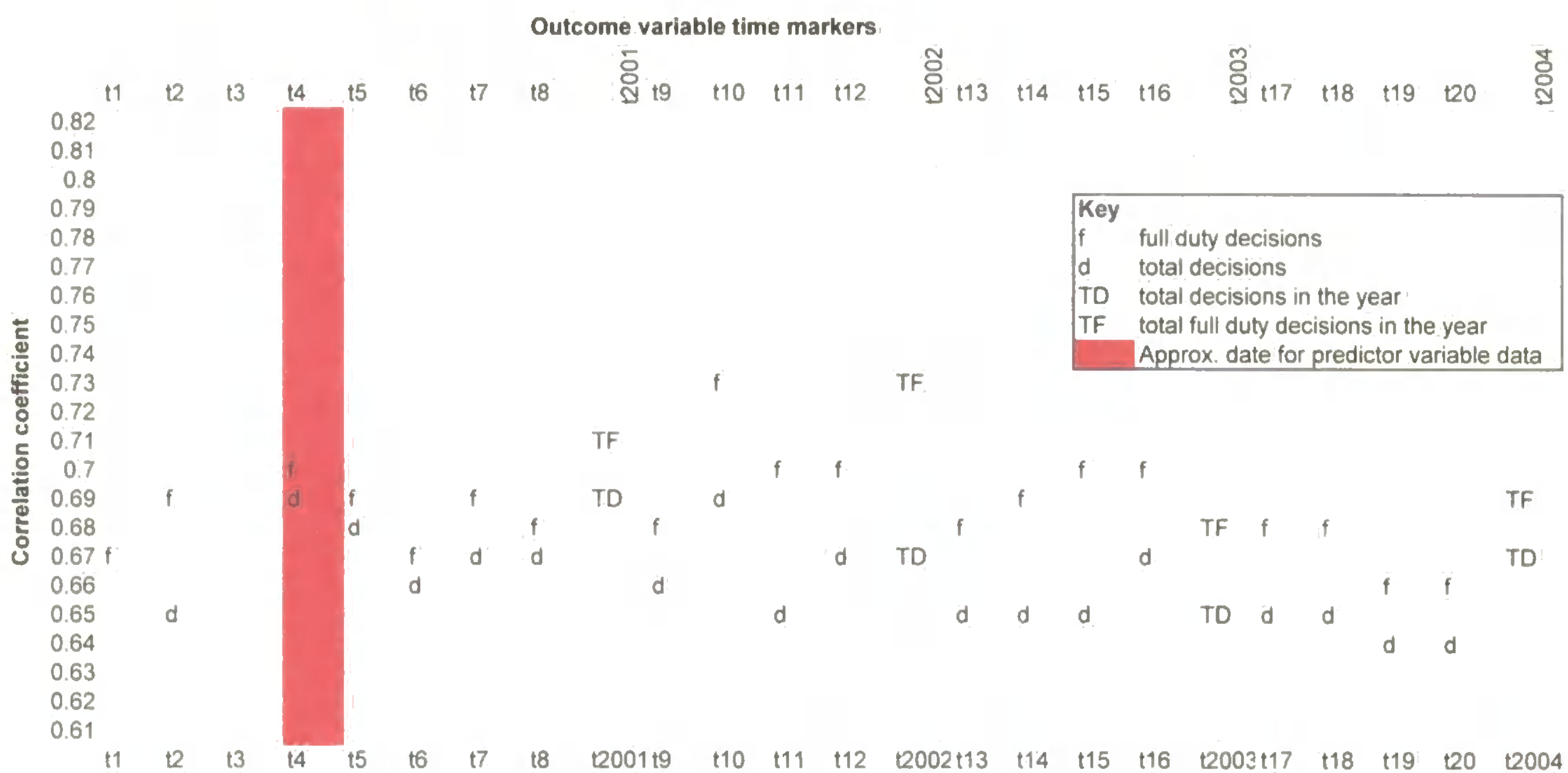


Figure 30ah - Pearson's correlation coefficients for variable logsexage1 and all potential outcome variables shown chronologically

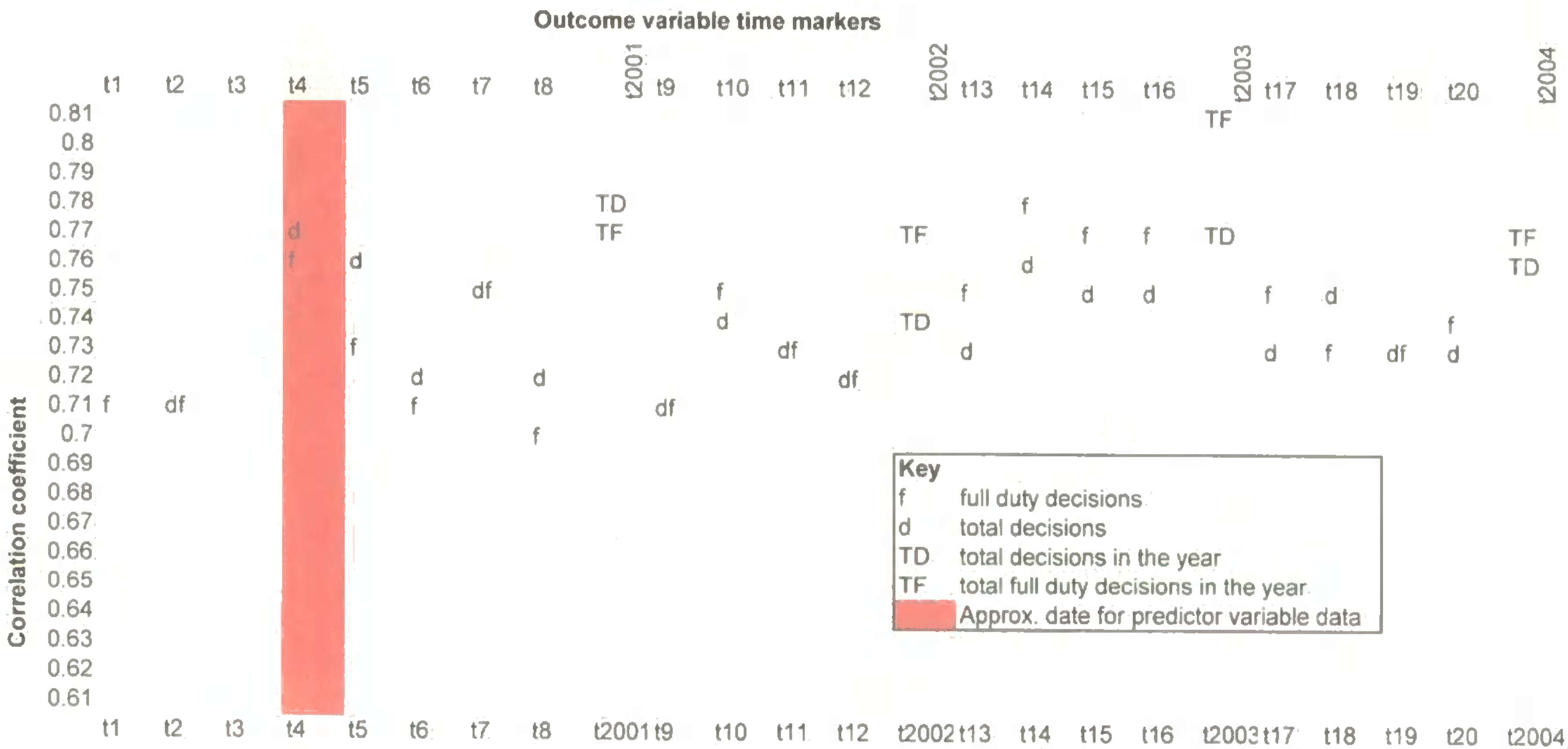


Figure 30ai - Pearson's correlation coefficients for variable logsexage3 and all potential outcome variables shown chronologically

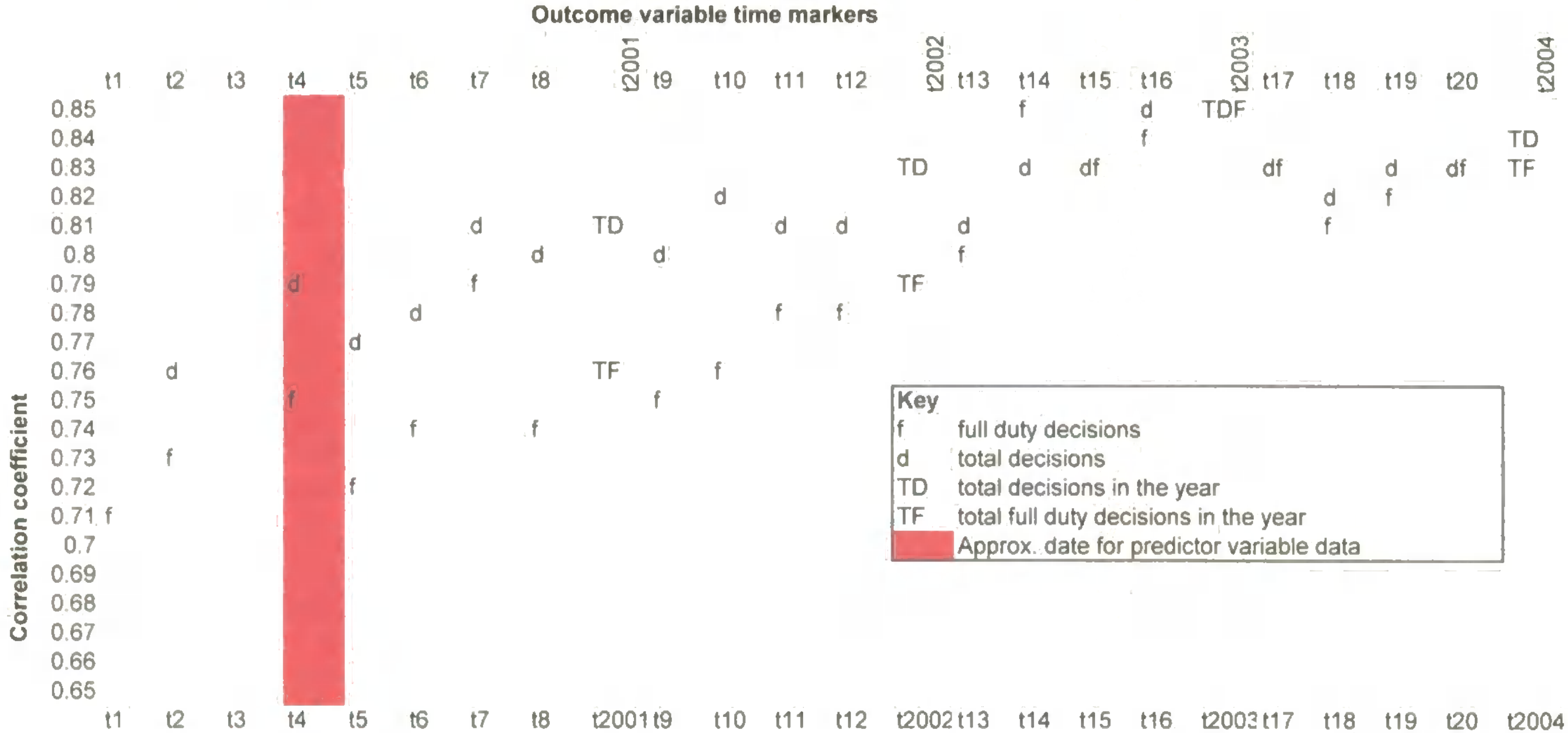


Figure 30aj - Pearson's correlation coefficients for variable sexage4 and all potential outcome variables shown chronologically

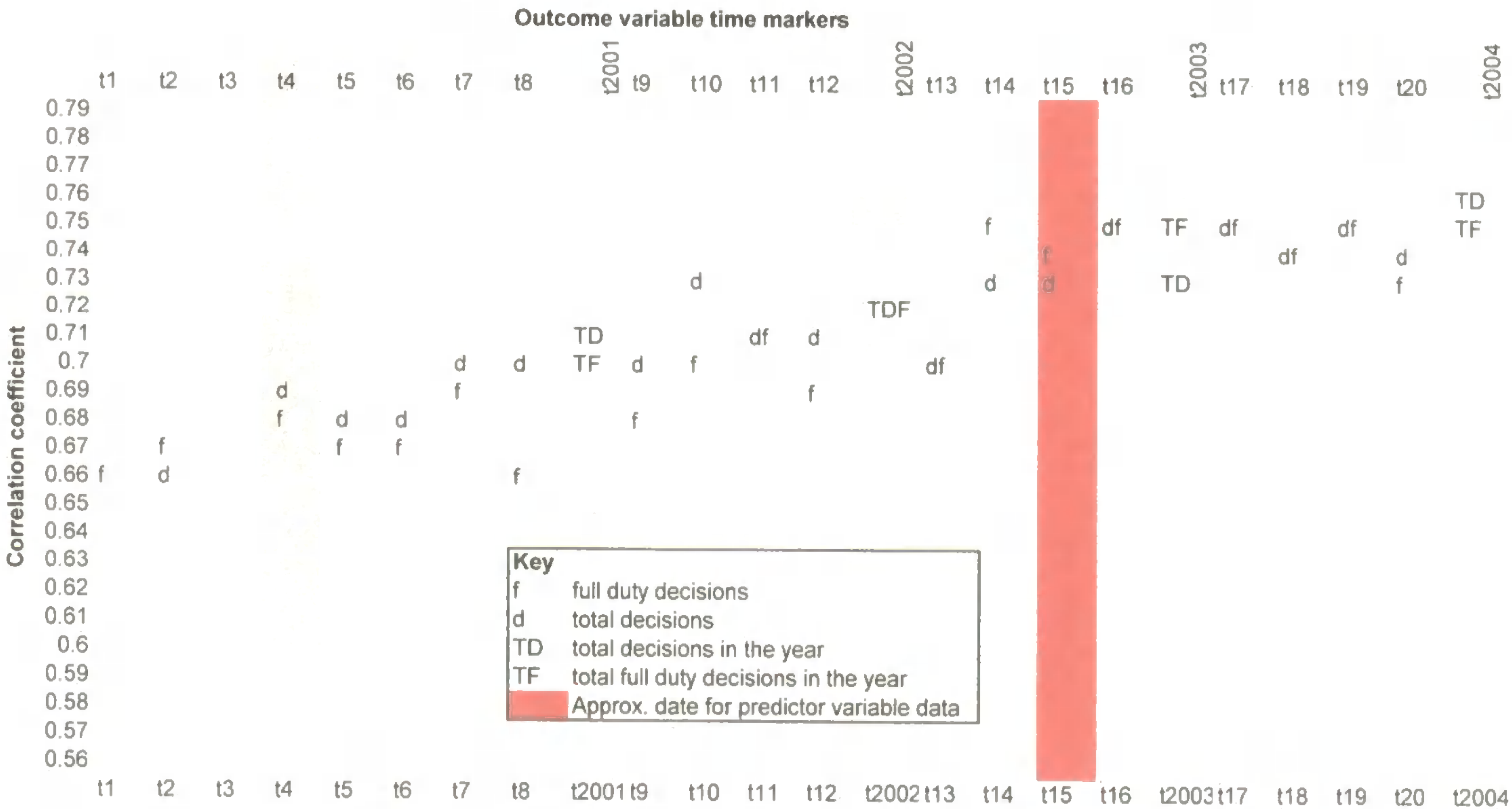


Figure 30ak - Pearson's correlation coefficients for variable logsexage6 and all potential outcome variables shown chronologically

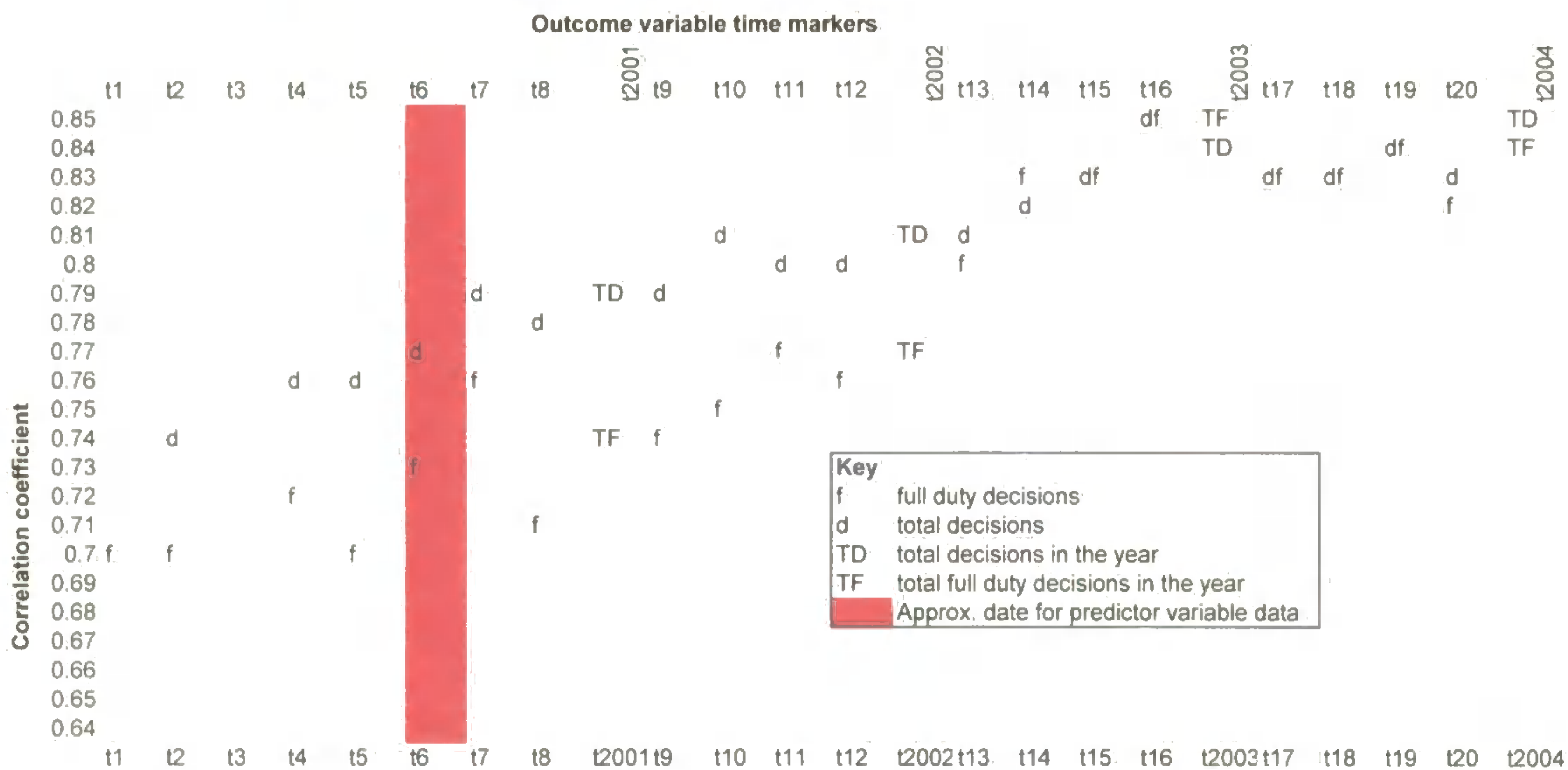


Figure 31 – Summary table showing proportion of variance in the outcome variable logT2003fd for all remaining predictor variables and how this proportion is affected when partial correlation is carried out controlling for the effect of each of the other variables.

	logpoorhealth1	logethnicity2	logpoverty3	logrelationship1	relationship5	logsexage3	logdeinst18	migration2
Original variance	**68%**	**55%**	**67.2%**	**76.9%**	**46.8%**	**73.1%**	**66.9%**	**44.6%**
logpoorhealth1	-	14.1%	15.3%	28.2%	6%	25%	16.2%	14.5%
logethnicity2	39.3%	-	44%	49.3%	7.5%	46.8%	28.1%	2.6%
logpoverty3	9%	18.7%	-	31.6%	13.8%	21.1%	16.6%	18%
logrelationship1	1.7%	1.6%	12.9%	-	0.2%	8.8%	0.9%	0.3%
relationship5	44.1%	21.9%	45%	56.5%	-	51.3%	41.7%	4%
logsexage3	2.1%	5.9%	4.1%	12.9%	7.3%	-	3.5%	14.7%
logdeinst18	19.9%	2.8%	25.8%	30.9%	6.7%	29.4%	-	7%
migration2	51.1%	21.2%	50.4%	58.4%	8.1%	57.5%	44.2%	-

Figure 32 - Multivariate analysis - Regression using blockwise entry for five remaining independent variables with dependent variable logT2003fd

Descriptive Statistics

	Mean	Std. Deviation	N
logT2003fd	2.358815	.415077254	288
logpoorhealth1	4.317921	.245466352	288
logsexage3	2.384081	.327176166	288
logpoverty3	2.995571	.445237488	288
logrelationship1	3.329651	.262293899	288
logethnicity2	2.966787	.452490218	288

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	logsexage3, logpoorhealth1	.	Enter
2	logpoverty3, logrelationship1	.	Enter
3	logethnicity2	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003fd

Model Summary [d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.858[a]	.737	.735	.213789517	.737	398.425	2	285	.000	
2	.883[b]	.780	.777	.196158705	.043	27.767	2	283	.000	
3	.883[c]	.780	.776	.196345798	.000	.461	1	282	.498	1.961

a. Predictors: (Constant), logsexage3, logpoorhealth1

b. Predictors: (Constant), logsexage3, logpoorhealth1, logpoverty3, logrelationship1

c. Predictors: (Constant), logsexage3, logpoorhealth1, logpoverty3, logrelationship1, logethnicity2

d. Dependent Variable: logT2003fd

Figure 32 - Multivariate analysis - Regression using blockwise entry for five remaining independent variables with dependent variable logT2003fd (continued)

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.421	2	18.210	398.425	.000[a]
	Residual	13.026	285	.046		
	Total	49.447	287			
2	Regression	38.558	4	9.639	250.516	.000[b]
	Residual	10.889	283	.038		
	Total	49.447	287			
3	Regression	38.575	5	7.715	200.123	.000[c]
	Residual	10.872	282	.039		
	Total	49.447	287			

a. Predictors: (Constant), logsexage3, logpoorhealth1

b. Predictors: (Constant), logsexage3, logpoorhealth1, logpoverty3, logrelationship1

c. Predictors: (Constant), logsexage3, logpoorhealth1, logpoverty3, logrelationship1, logethnicity2

d. Dependent Variable: logT2003fd

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-1.039	.338		-3.074	.002	-1.704	-.374					
	logpoorhealth1	.301	.120	.178	2.499	.013	.064	.538	.805	.146	.076	.183	5.477
	logsexage3	.881	.090	.694	9.755	.000	.703	1.058	.855	.500	.297	.183	5.477
2	(Constant)	-1.065	.333		-3.203	.002	-1.720	-.410					
	logpoorhealth1	-.204	.130	-.120	-1.562	.119	-.460	.053	.805	-.092	-.044	.131	7.644
	logsexage3	.212	.124	.167	1.719	.087	-.031	.456	.855	.102	.048	.082	12.193
	logpoverty3	.289	.068	.310	4.273	.000	.156	.422	.820	.246	.119	.148	6.753
	logrelationship1	.881	.129	.556	6.820	.000	.626	1.135	.862	.376	.190	.117	8.555
3	(Constant)	-1.130	.346		-3.263	.001	-1.812	-.448					
	logpoorhealth1	-.231	.137	-.137	-1.691	.092	-.500	.038	.805	-.100	-.047	.119	8.373
	logsexage3	.196	.126	.155	1.557	.121	-.052	.444	.855	.092	.043	.079	12.648
	logpoverty3	.290	.068	.311	4.285	.000	.157	.423	.820	.247	.120	.148	6.758
	logrelationship1	.982	.198	.621	4.962	.000	.593	1.372	.862	.283	.139	.050	20.079
	logethnicity2	-.041	.060	-.044	-.679	.498	-.159	.077	.724	-.040	-.019	.182	5.499

a. Dependent Variable: logT2003fd

Figure 32 - Multivariate analysis - Regression using blockwise entry for five remaining independent variables with dependent variable logT2003fd (continued)

Excluded Variables [c]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	logpoverty3	.214[a]	2.788	.006	.163	.154	6.498	.128
	logrelationship1	.489[a]	5.928	.000	.332	.121	8.231	.116
	logethnicity2	.181[a]	4.038	.000	.233	.434	2.303	.157
2	logethnicity2	-.044[b]	-.679	.498	-.040	.182	5.499	.050

a. Predictors in the Model: (Constant), logsexage3, logpoorhealth1

b. Predictors in the Model: (Constant), logsexage3, logpoorhealth1, logpoverty3, logrelationship1

c. Dependent Variable: logT2003fd

Casewise Diagnostics [a]

Case Number	Std. Residual	logT2003fd	Predicted Value	Residual
10	-2.017	1.748188	2.1442304	********
20	-2.393	1.505150	1.9750622	********
41	-2.249	1.579784	2.0214017	********
54	2.351	2.593286	2.1317088	********
76	-3.540	.903090	1.5980884	********
113	-2.055	2.041393	2.4448257	********
121	-3.004	1.755875	2.3457080	********
145	-3.257	1.662758	2.3023063	********
221	-2.444	2.408240	2.8881636	********
266	2.150	2.264818	1.8426839	********
315	-2.238	1.079181	1.5185233	********
340	-2.345	1.000000	1.4605039	********

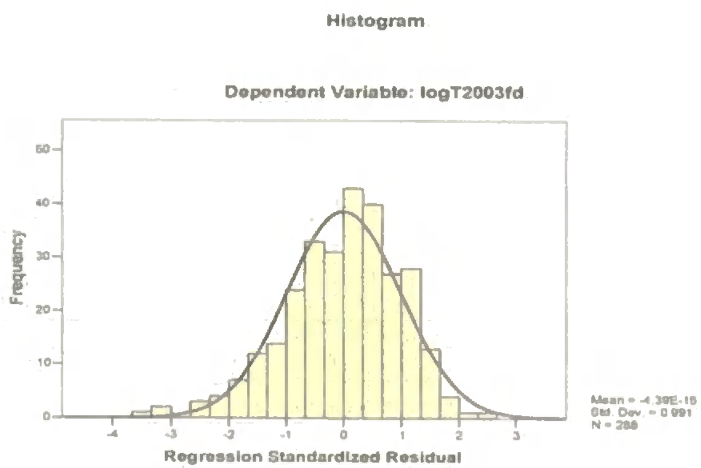
a. Dependent Variable: logT2003fd

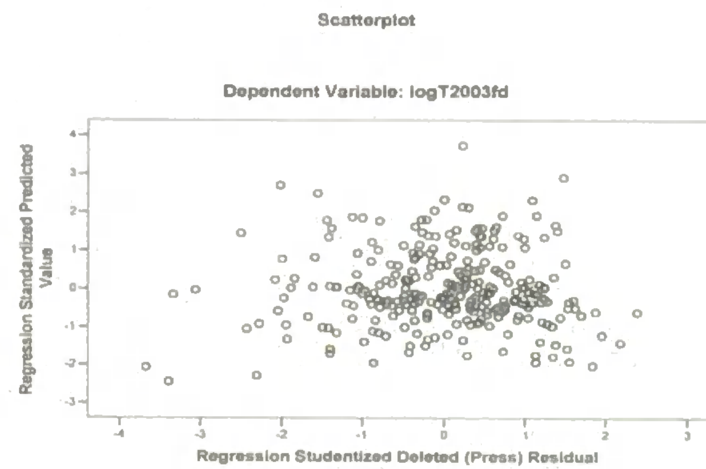
Residuals Statistics [a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.460504	3.726336	2.358815	.366618447	288
Std. Predicted Value	-2.450	3.730	.000	1.000	288
Standard Error of Predicted Value	.013	.139	.027	.010	288
Adjusted Predicted Value	1.540775	3.723463	2.360413	.363417355	288
Residual	********	********	********	.194627954	288
Std. Residual	-3.540	2.351	.000	.991	288
Stud. Residual	-3.595	2.369	-.003	1.011	288
Deleted Residual	********	********	********	.204249025	288
Stud. Deleted Residual	-3.674	2.389	-.005	1.016	288
Mahal. Distance	.259	143.516	4.983	8.831	288
Cook's Distance	.000	1.873	.010	.110	288
Centered Leverage Value	.001	.500	.017	.031	288

a. Dependent Variable: logT2003fd

Figure 32 - Multivariate analysis - Regression using blockwise entry for five remaining independent variables with dependent variable logT2003fd (continued)





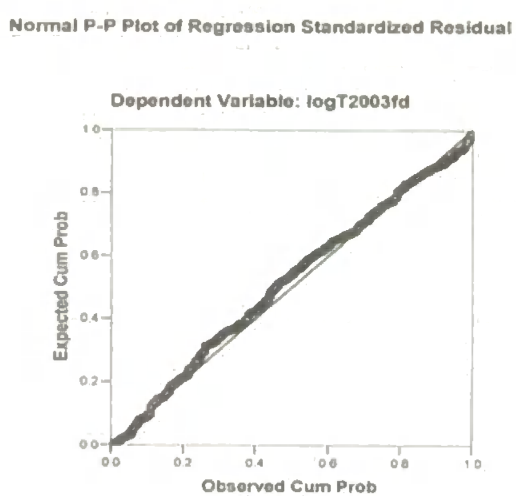


Figure 33 - Multivariate analysis - Regression using blockwise entry method with five remaining independent variables with dependent variable logT2003d

Descriptive Statistics

	Mean	Std. Deviation	N
logT2003d	2.669390	.442468398	289
logsexage3	2.384482	.327884881	289
logpoorhealth1	4.318768	.245788512	289
logpoverty3	2.996848	.446153211	289
logrelationship1	3.330622	.262400722	289
logethnicity2	2.967303	.451467920	289

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	logpoorhealth1, logsexage3[a]	.	Enter
2	logpoverty3, logrelationship1[a]	.	Enter
3	logethnicity2[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003d

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.849[a]	.721	.719	.234375767	.721	370.218	2	286	.000	
2	.866[b]	.750	.746	.222902608	.028	16.100	2	284	.000	
3	.866[c]	.750	.746	.223199469	.000	.245	1	283	.621	1.785

a. Predictors: (Constant), logpoorhealth1, logsexage3

b. Predictors: (Constant), logpoorhealth1, logsexage3, logpoverty3, logrelationship1

c. Predictors: (Constant), logpoorhealth1, logsexage3, logpoverty3, logrelationship1, logethnicity2

d. Dependent Variable: logT2003d

Figure 33 - Multivariate analysis - Regression using blockwise entry method with five remaining independent variables with dependent variable logT2003d (continued)

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.674	2	20.337	370.218	.000[a]
	Residual	15.711	286	.055		
	Total	56.384	288			
2	Regression	42.273	4	10.568	212.705	.000[b]
	Residual	14.111	284	.050		
	Total	56.384	288			
3	Regression	42.286	5	8.457	169.761	.000[c]
	Residual	14.098	283	.050		
	Total	56.384	288			

a. Predictors: (Constant), logpoorhealth1, logsexage3

b. Predictors: (Constant), logpoorhealth1, logsexage3, logpoverty3, logrelationship1

c. Predictors: (Constant), logpoorhealth1, logsexage3, logpoverty3, logrelationship1, logethnicity2

d. Dependent Variable: logT2003d

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.702	.370		-1.896	.059	-1.430	.027					
	logsexage3	.982	.099	.728	9.941	.000	.787	1.176	.847	.507	.310	.182	5.500
	logpoorhealth1	.238	.132	.132	1.810	.071	-.021	.498	.791	.106	.056	.182	5.500
2	(Constant)	-.532	.378		-1.409	.160	-1.276	.212					
	logsexage3	.391	.140	.290	2.791	.006	.115	.668	.847	.163	.083	.082	12.257
	logpoorhealth1	-.210	.148	-.117	-1.417	.158	-.502	.082	.791	-.084	-.042	.130	7.687
	logpoverty3	.330	.077	.333	4.302	.000	.179	.481	.819	.247	.128	.147	6.797
	logrelationship1	.656	.147	.389	4.466	.000	.367	.945	.831	.256	.133	.116	8.613
3	(Constant)	-.585	.393		-1.488	.138	-1.359	.189					
	logsexage3	.378	.143	.280	2.644	.009	.097	.660	.847	.155	.079	.079	12.712
	logpoorhealth1	-.232	.155	-.129	-1.498	.135	-.538	.073	.791	-.089	-.045	.119	8.416
	logpoverty3	.331	.077	.334	4.306	.000	.180	.482	.819	.248	.128	.147	6.800
	logrelationship1	.740	.224	.439	3.297	.001	.298	1.182	.831	.192	.098	.050	20.049
	logethnicity2	-.034	.068	-.034	-.495	.621	-.167	.100	.687	-.029	-.015	.185	5.416

a. Dependent Variable: logT2003d

Figure 33 - Multivariate analysis - Regression using blockwise entry method with five remaining independent variables with dependent variable logT2003d (continued)

Excluded Variables[c]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	logpoverty3	.266[a]	3.390	.001	.197	.153	6.540	.128
	logrelationship1	.316[a]	3.592	.000	.208	.121	8.288	.116
	logethnicity2	.115[a]	2.451	.015	.144	.438	2.286	.157
2	logethnicity2	-.034[b]	-.495	.621	-.029	.185	5.416	.050

a. Predictors in the Model: (Constant), logpoorhealth1, logsexage3

b. Predictors in the Model: (Constant), logpoorhealth1, logsexage3, logpoverty3, logrelationship1

c. Dependent Variable: logT2003d

Casewise Diagnostics[a]

Case Number	Std. Residual	logT2003d	Predicted Value	Residual
18	2.226	3.011993	2.5151263	********
20	-2.443	1.698970	2.2442439	********
49	2.092	3.230449	2.7634061	********
61	-2.048	1.556303	2.0133860	********
76	-3.348	1.113943	1.8613165	********
145	-4.107	1.662758	2.5794783	********
169	2.058	3.577836	3.1184623	********
192	-2.511	2.850646	3.4110629	********
221	-2.216	2.717671	3.2122476	********
244	-2.094	1.732394	2.1997417	********
268	2.179	2.492760	2.0064550	********
332	-2.464	2.173186	2.7231496	********
340	-2.300	1.230449	1.7437840	********
341	-2.180	2.075547	2.5621288	********
351	2.224	3.137354	2.6408735	********

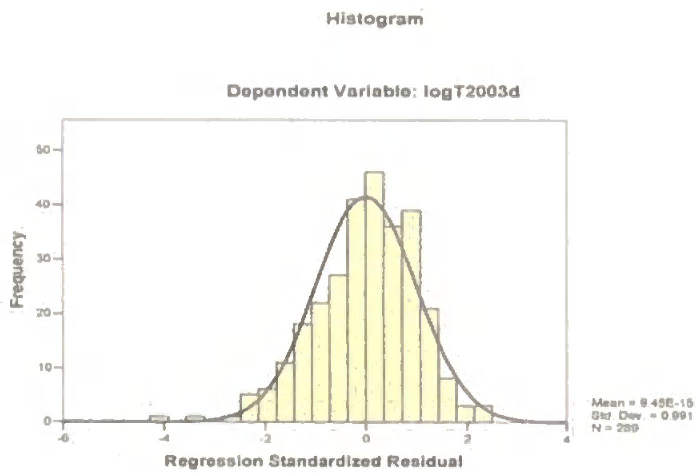
a. Dependent Variable: logT2003d

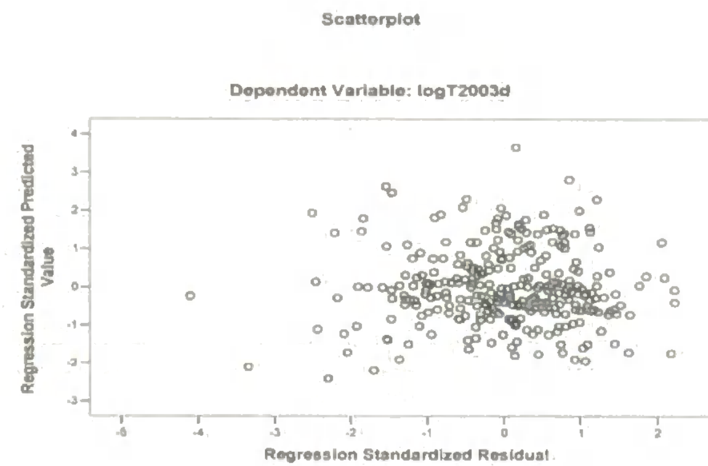
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.743784	4.069348	2.669390	.383177734	289
Std. Predicted Value	-2.416	3.654	.000	1.000	289
Standard Error of Predicted Value	.015	.158	.030	.011	289
Adjusted Predicted Value	1.846115	4.067086	2.671171	.379752035	289
Residual	********	********	********	.221253490	289
Std. Residual	-4.107	2.226	.000	.991	289
Stud. Residual	-4.130	2.255	-.003	1.011	289
Deleted Residual	********	********	********	.231931893	289
Stud. Deleted Residual	-4.253	2.271	-.005	1.016	289
Mahal. Distance	.256	143.384	4.983	8.808	289
Cook's Distance	.000	1.777	.010	.105	289
Centered Leverage Value	.001	.498	.017	.031	289

a. Dependent Variable: logT2003d

Figure 33 - Multivariate analysis - Regression using blockwise entry method with five remaining independent variables with dependent variable logT2003d (continued)





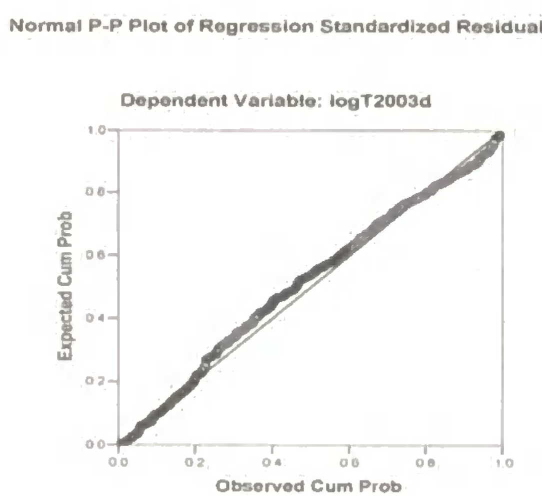


Figure 34 - Multivariate analysis - factor analysis for remaining five independent variables at Local Authority level

Correlation Matrix [a]

		logpoorhealth1	logethnicity2	logpoverty3	logrelationship1	logsexage3
Correlation	logpoorhealth1	1.000	.702	.879	.903	.906
	logethnicity2	.702	1.000	.666	.877	.746
	logpoverty3	.879	.666	1.000	.840	.910
	logrelationship1	.903	.877	.840	1.000	.924
	logsexage3	.906	.746	.910	.924	1.000
Sig. (1-tailed)	logpoorhealth1		.000	.000	.000	.000
	logethnicity2	.000		.000	.000	.000
	logpoverty3	.000	.000		.000	.000
	logrelationship1	.000	.000	.000		.000
	logsexage3	.000	.000	.000	.000	

a. Determinant = .001

Inverse of Correlation Matrix

	logpoorhealth1	logethnicity2	logpoverty3	logrelationship1	logsexage3
logpoorhealth1	8.568	2.345	-2.591	-6.938	-.740
logethnicity2	2.345	5.587	-.389	-8.230	1.666
logpoverty3	-2.591	-.389	6.637	1.744	-5.014
logrelationship1	-6.938	-8.230	1.744	20.552	-8.151
logsexage3	-.740	1.666	-5.014	-8.151	12.522

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.803
Bartlett's Test of Sphericity	Approx. Chi-Square	2589.596
	df	10
	Sig.	.000

Anti-image Matrices

		logpoorhealth1	logethnicity2	logpoverty3	logrelationship1	logsexage3
Anti-image Covariance	logpoorhealth1	.117	.049	-.046	-.039	-.007
	logethnicity2	.049	.179	-.011	-.072	.024
	logpoverty3	-.046	-.011	.151	.013	-.060
	logrelationship1	-.039	-.072	.013	.049	-.032
	logsexage3	-.007	.024	-.060	-.032	.080
Anti-image Correlation	logpoorhealth1	.850[a]	.339	-.344	-.523	-.071
	logethnicity2	.339	.751[a]	-.064	-.768	.199
	logpoverty3	-.344	-.064	.860[a]	.149	-.550
	logrelationship1	-.523	-.768	.149	.733[a]	-.508
	logsexage3	-.071	.199	-.550	-.508	.835[a]

a. Measures of Sampling Adequacy(MSA)

Figure 34 - Multivariate analysis - factor analysis for remaining five independent variables at Local Authority level (contd.)

Communalities

	Initial	Extraction
logpoorhealth1	1.000	.892
logethnicity2	1.000	.725
logpoverty3	1.000	.853
logrelationship1	1.000	.950
logsexage3	1.000	.930

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.350	87.007	87.007	4.350	87.007	87.007
2	.408	8.170	95.177			
3	.128	2.569	97.746			
4	.080	1.608	99.354			
5	.032	.646	100.000			

Extraction Method: Principal Component Analysis.

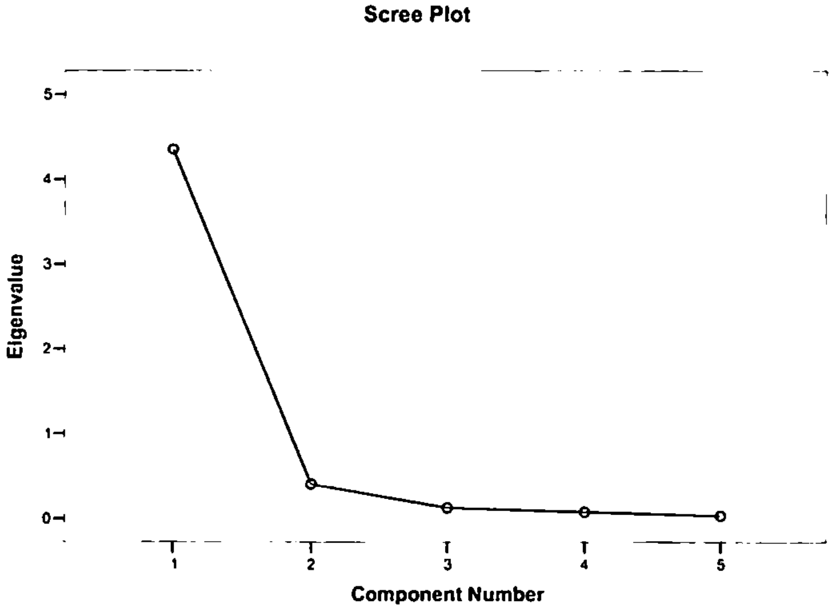


Figure 34 - Multivariate analysis - factor analysis for remaining five independent variables at Local Authority level (contd.)

Component Matrix [a]

	Component
	1
logrelationship1	.975
logsexage3	.965
logpoorhealth1	.944
logpoverty3	.923
logethnicity2	.852

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Reproduced Correlations

		logpoorhealth1	logethnicity2	logpoverty3	logrelationship1	logsexage3
Reproduced Correlation	logpoorhealth1	.892[b]	.804	.872	.921	.911
	logethnicity2	.804	.725[b]	.786	.830	.821
	logpoverty3	.872	.786	.853[b]	.900	.891
	logrelationship1	.921	.830	.900	.950[b]	.940
	logsexage3	.911	.821	.891	.940	.930[b]
Residual[a]	logpoorhealth1		-.102	.007	-.017	-.005
	logethnicity2	-.102		-.120	.047	-.075
	logpoverty3	.007	-.120		-.061	.020
	logrelationship1	-.017	.047	-.061		-.017
	logsexage3	-.005	-.075	.020	-.017	

Extraction Method: Principal Component Analysis.

a. Residuals are computed between observed and reproduced correlations. There are 4 (40.0%) nonredundant residuals with absolute values greater than 0.05.

b. Reproduced communalities

Figure 35- Multivariate analysis - Simple regression using social disadvantage factor scores and the dependent variable logT2003fd

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	REGR factor score 1 for analysis 1[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003fd

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.874[a]	.763	.762	.202288141

a. Predictors: (Constant), REGR factor score 1 for analysis 1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.744	1	37.744	922.367	.000[a]
	Residual	11.703	286	.041		
	Total	49.447	287			

a. Predictors: (Constant), REGR factor score 1 for analysis 1

b. Dependent Variable: logT2003fd

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.373	.012		198.936	.000
	REGR factor score 1 for analysis 1	.366	.012	.874	30.370	.000

a. Dependent Variable: logT2003fd

Figure 36 - Multivariate analysis - simple regression using social disadvantage factor scores with dependent variable logT2003d

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	REGR factor score 1 for analysis 1[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003d

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.855[a]	.730	.729	.230165837

a. Predictors: (Constant), REGR factor score 1 for analysis 1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.180	1	41.180	777.327	.000[a]
	Residual	15.204	287	.053		
	Total	56.384	288			

a. Predictors: (Constant), REGR factor score 1 for analysis 1

b. Dependent Variable: logT2003d

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.683	.014		198.055	.000
	REGR factor score 1 for analysis 1	.381	.014	.855	27.881	.000

a. Dependent Variable: logT2003d

Figure 37 - Multivariate analysis - simple regression using logpoorhealth1 with both dependent variables

logT2003fd

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logpoorhealth1[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003fd

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.827[a]	.683	.682	.246270116

a. Predictors: (Constant), logpoorhealth1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.585	1	37.585	619.722	.000[a]
	Residual	17.406	287	.061		
	Total	54.992	288			

a. Predictors: (Constant), logpoorhealth1

b. Dependent Variable: logT2003fd

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.446	.233		-14.771	.000
	logpoorhealth1	1.344	.054	.827	24.894	.000

a. Dependent Variable: logT2003fd

Figure 37 - Multivariate analysis - simple regression using logpoorhealth1 with both dependent variables (continued)

logT2003d

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logpoorhealth1[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003d

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.807[a]	.651	.650	.272122882

a. Predictors: (Constant), logpoorhealth1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.847	1	39.847	538.103	.000[a]
	Residual	21.327	288	.074		
	Total	61.174	289			

a. Predictors: (Constant), logpoorhealth1

b. Dependent Variable: logT2003d

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.292	.257		-12.802	.000
	logpoorhealth1	1.381	.060	.807	23.197	.000

a. Dependent Variable: logT2003d

Figure 38 - Multivariate analysis - simple regression using logsexage3 with both dependent variables

logT2003fd

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logsexage3[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003fd

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.855[a]	.731	.730	.215741364

a. Predictors: (Constant), logsexage3

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.135	1	36.135	776.363	.000[a]
	Residual	13.312	286	.047		
	Total	49.447	287			

a. Predictors: (Constant), logsexage3

b. Dependent Variable: logT2003fd

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.227	.094		-2.421	.016
	logsexage3	1.085	.039	.855	27.863	.000

a. Dependent Variable: logT2003fd

Figure 38 - Multivariate analysis - simple regression using logsexage3 with both dependent variables (continued)

logT2003d

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logsexage3[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003d

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.847[a]	.718	.717	.235302731

a. Predictors: (Constant), logsexage3

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.494	1	40.494	731.364	.000[a]
	Residual	15.890	287	.055		
	Total	56.384	288			

a. Predictors: (Constant), logsexage3

b. Dependent Variable: logT2003d

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.058	.102		-.565	.572
	logsexage3	1.144	.042	.847	27.044	.000

a. Dependent Variable: logT2003d

Figure 39 - Multivariate analysis - simple regression using logethnicity2 with both dependent variables

logT2003fd

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logethnicity2[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003fd

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.743[a]	.552	.550	.293106542

a. Predictors: (Constant), logethnicity2

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.335	1	30.335	353.098	.000[a]
	Residual	24.657	287	.086		
	Total	54.992	288			

a. Predictors: (Constant), logethnicity2

b. Dependent Variable: logT2003fd

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.285	.111		2.562	.011
	logethnicity2	.698	.037	.743	18.791	.000

a. Dependent Variable: logT2003fd

Figure 39 - Multivariate analysis - simple regression using logethnicity2 with both dependent variables (continued)

logT2003d

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logethnicity2[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003d

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.707[a]	.500	.499	.325774409

a. Predictors: (Constant), logethnicity2

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.608	1	30.608	288.408	.000[a]
	Residual	30.565	288	.106		
	Total	61.174	289			

a. Predictors: (Constant), logethnicity2

b. Dependent Variable: logT2003d

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.586	.124		4.732	.000
	logethnicity2	.701	.041	.707	16.983	.000

a. Dependent Variable: logT2003d

Figure 40 - Multivariate analysis - simple regression using logrelationship1 with both dependent variables

logT2003fd

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logrelationship1[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003fd

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877[a]	.769	.768	.210527449

a. Predictors: (Constant), logrelationship1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.271	1	42.271	953.738	.000[a]
	Residual	12.720	287	.044		
	Total	54.992	288			

a. Predictors: (Constant), logrelationship1

b. Dependent Variable: logT2003fd

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-2.167	.147		-14.760	.000
	logrelationship1	1.359	.044	.877	30.883	.000

a. Dependent Variable: logT2003fd

Figure 40 - Multivariate analysis - simple regression using logrelationship1 with both dependent variables (continued)

logT2003d

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logrelationship1[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003d

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.845[a]	.714	.713	.246442689

a. Predictors: (Constant), logrelationship1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.682	1	43.682	719.238	.000[a]
	Residual	17.491	288	.061		
	Total	61.174	289			

a. Predictors: (Constant), logrelationship1

b. Dependent Variable: logT2003d

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.923	.172		-11.208	.000
	logrelationship1	1.379	.051	.845	26.819	.000

a. Dependent Variable: logT2003d

Figure 41 - Multivariate analysis - simple regression using logpoverty3 with both dependent variables

logT2003fd

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logpoverty3[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003fd

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.820[a]	.673	.672	.237837459

a. Predictors: (Constant), logpoverty3

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.269	1	33.269	588.136	.000[a]
	Residual	16.178	286	.057		
	Total	49.447	287			

a. Predictors: (Constant), logpoverty3

b. Dependent Variable: logT2003fd

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.068	.095		.713	.476
	logpoverty3	.765	.032	.820	24.252	.000

a. Dependent Variable: logT2003fd

Figure 41 - Multivariate analysis - simple regression using logpoverty3 with both dependent variables (continued)

logT2003d

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	logpoverty3[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: logT2003d

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.819[a]	.671	.669	.254405805

a. Predictors: (Constant), logpoverty3

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.809	1	37.809	584.170	.000[a]
	Residual	18.575	287	.065		
	Total	56.384	288			

a. Predictors: (Constant), logpoverty3

b. Dependent Variable: logT2003d

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.236	.102		2.314	.021
	logpoverty3	.812	.034	.819	24.170	.000

a. Dependent Variable: logT2003d

Figure 42 - Summary of variance in outcome variables explained by key independent variables and combinations of those variables

One Independent variable	R^2 value when regressed on logT2003fd	R^2 value when regressed on logT2003d
Factor scores	.763	.73
Logrelationship1	.769	.714
Logsexage3	.731	.718
Logpoorhealth1	.683	.651
Logpoverty3	.673	.671
Logethnicity2	.552	.500

All R^2 values are significant at p>0.01 (one tailed) unless otherwise stated

Two Independent variables	R^2 value when regressed on logT2003fd	R^2 value when regressed on logT2003d
Logrelationship1 and logethnicity2	.772	.719
Logrelationship1 and logpoverty3	.776	.742
Logpoorhealth1 and logethnicity2	.728	.685
Logpoorhealth1 and logpoverty3	.702	.691
Logpoverty3 and logethnicity2	.734	.711
Logsexage3 and logethnicity2	.747	.725

All R^2 values are significant at p>0.01 (one tailed) unless otherwise stated

Three Independent variables	R^2 value when regressed on logT2003fd	R^2 value when regressed on logT2003d
Logrelationship1 & logpoverty3 & logethnicity2	.776	.742
Logpoorhealth1 & logpoverty3 & logethnicity2	.742	.717

All R^2 values are significant at p>0.01 (one tailed) unless otherwise stated

Figure 43 - Multivariate analysis - distribution statistics and histograms for Local Authority level variables amalgamated to County level

Statistics

		relationship1a	sexage3a
N	Valid	149	148
	Missing	0	1
Mean		6320.15	804.30
Median		4950.00	650.00
Mode		2121[a]	338[a]
Std. Deviation		4494.957	539.816
Variance		2E+007	291400.8
Skewness		2.082	2.092
Std. Error of Skewness		.199	.199
Kurtosis		5.008	6.197
Std. Error of Kurtosis		.395	.396
Range		26085	3367
Minimum		36	53
Maximum		26121	3420

a. Multiple modes exist. The smallest value is shown

relationship1a

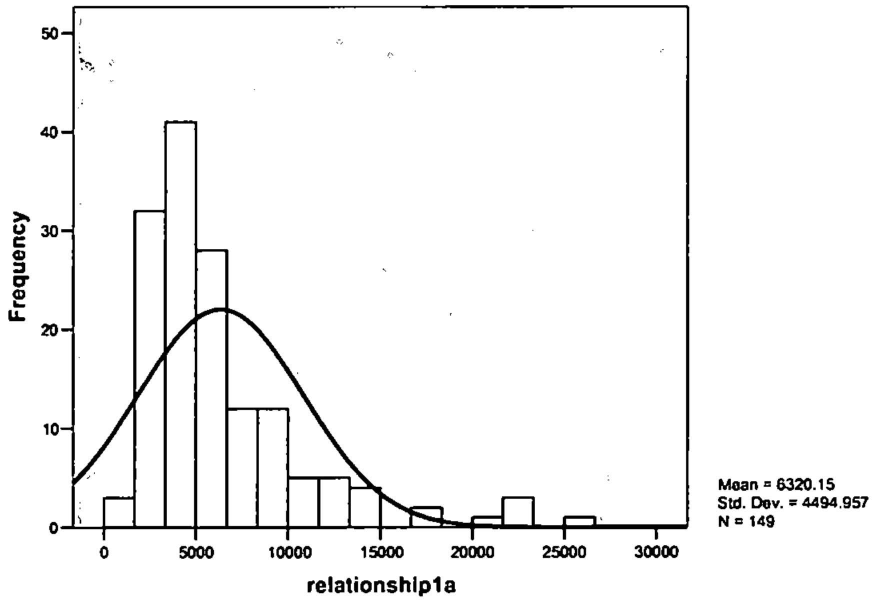


Figure 43 - Multivariate analysis - distribution statistics and histograms for Local Authority level variables amalgamated to County level (continued)

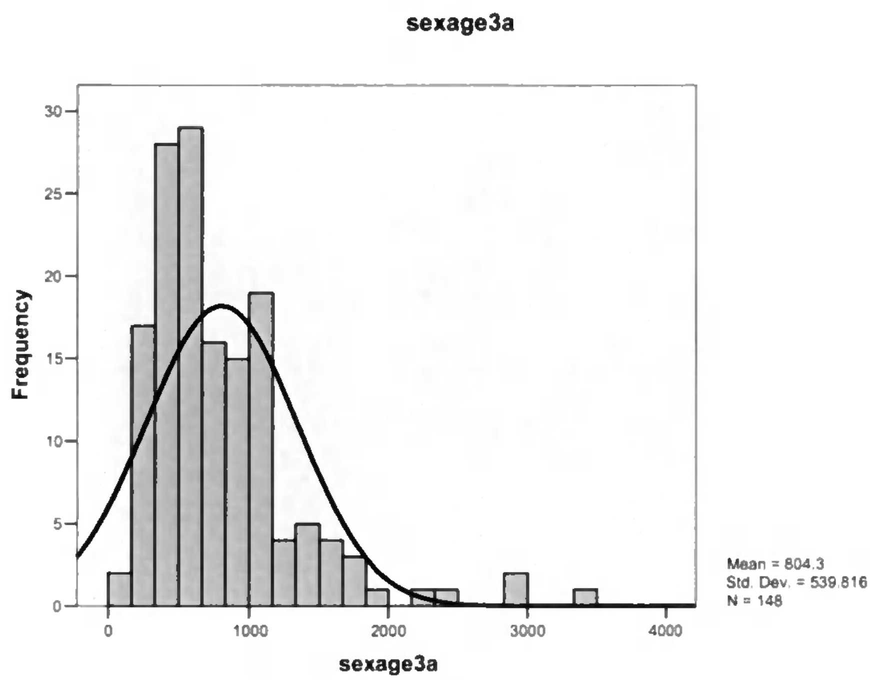


Figure 44 - Multivariate analysis - correlation statistics for County level variables and both dependent variables

Correlations

		logrelationship1a	logsexage3a	logdrugs1	deinst7	logT2003d	logT2003fd
logrelationship1a	Pearson Correlation	1	.894**	.601**	.730**	.864**	.888**
	Sig. (1-tailed)		.000	.000	.000	.000	.000
	N	149	148	148	149	105	100
logsexage3a	Pearson Correlation	.894**	1	.726**	.734**	.796**	.807**
	Sig. (1-tailed)	.000		.000	.000	.000	.000
	N	148	148	148	148	104	99
logdrugs1	Pearson Correlation	.601**	.726**	1	.510**	.646**	.641**
	Sig. (1-tailed)	.000	.000		.000	.000	.000
	N	148	148	148	148	104	99
deinst7	Pearson Correlation	.730**	.734**	.510**	1	.613**	.625**
	Sig. (1-tailed)	.000	.000	.000		.000	.000
	N	149	148	148	149	105	100
logT2003d	Pearson Correlation	.864**	.796**	.646**	.613**	1	.954**
	Sig. (1-tailed)	.000	.000	.000	.000		.000
	N	105	104	104	105	105	100
logT2003fd	Pearson Correlation	.888**	.807**	.641**	.625**	.954**	1
	Sig. (1-tailed)	.000	.000	.000	.000	.000	
	N	100	99	99	100	100	100

**. Correlation is significant at the 0.01 level (1-tailed).

Scatterplot for logrelationship1a and logT2003d

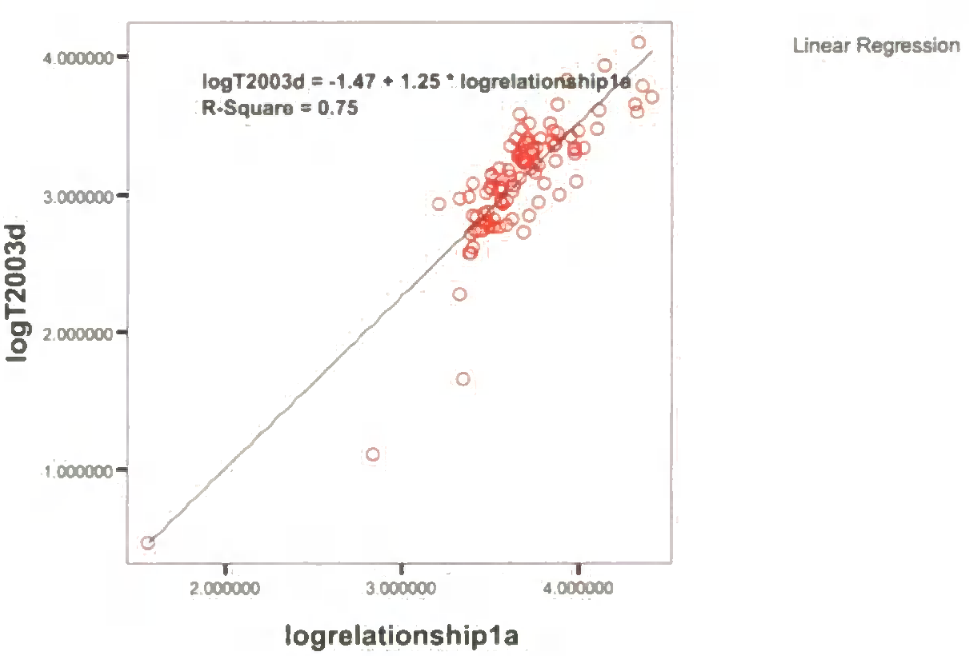
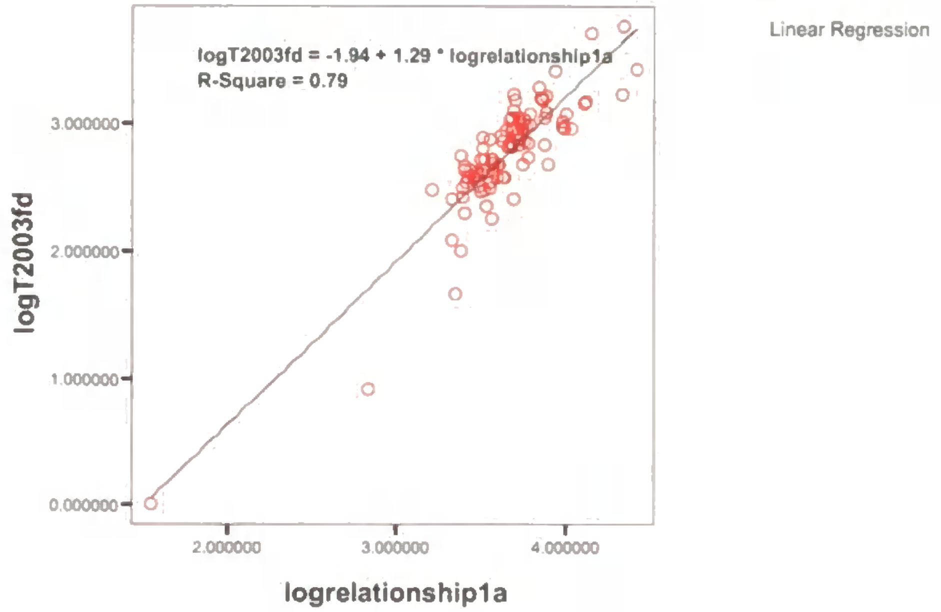


Figure 44 - Multivariate analysis - correlation statistics for County level variables and both dependent variables (continued)

Scatterplot for logrelationship1a and logT2003fd



Scatterplot for logsexage3a and logT2003d

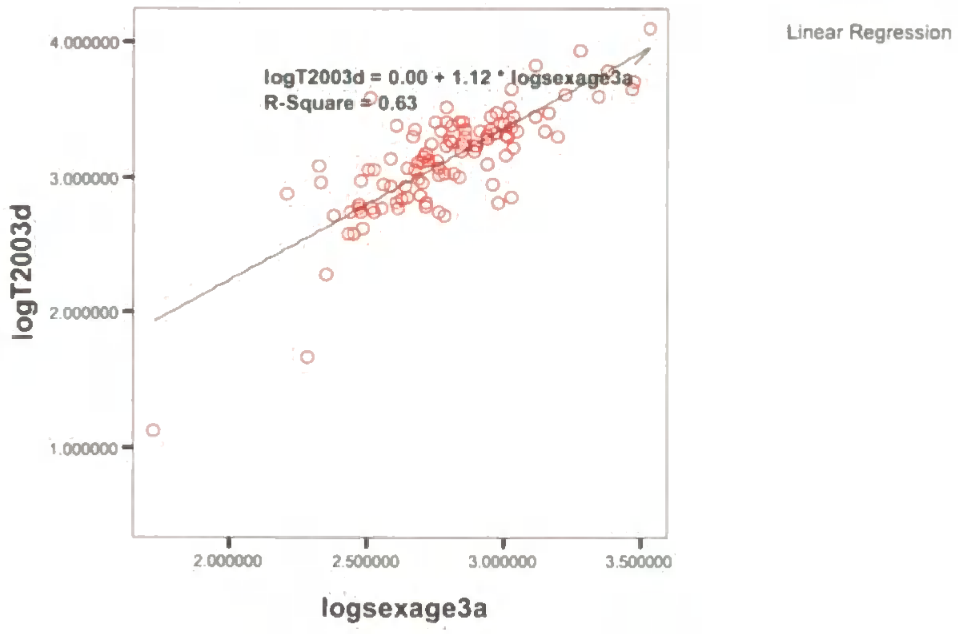
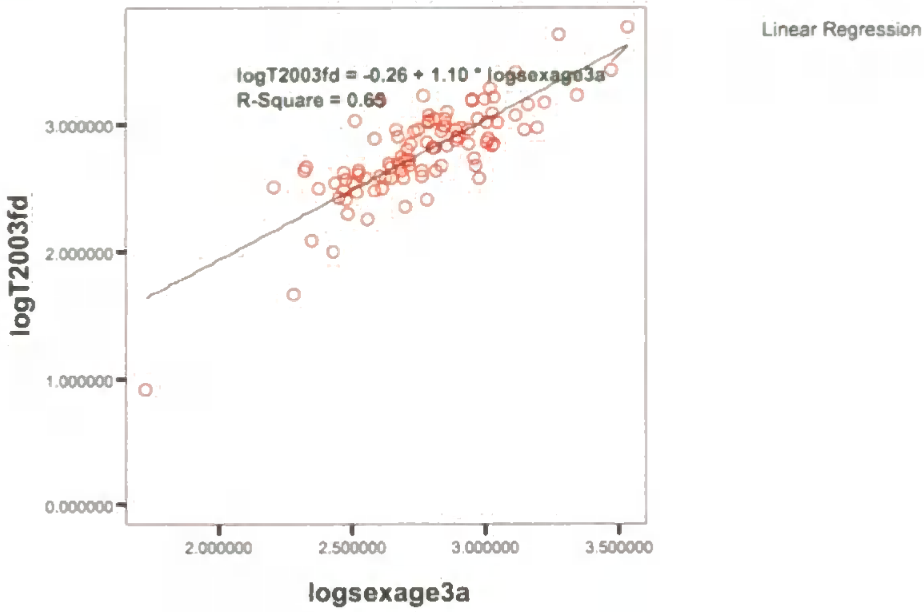


Figure 44 - Multivariate analysis - correlation statistics for County level variables and both dependent variables (continued)

Scatterplot for logsexage3a and logT2003fd



Scatterplot for logdrugs1 and logT2003d

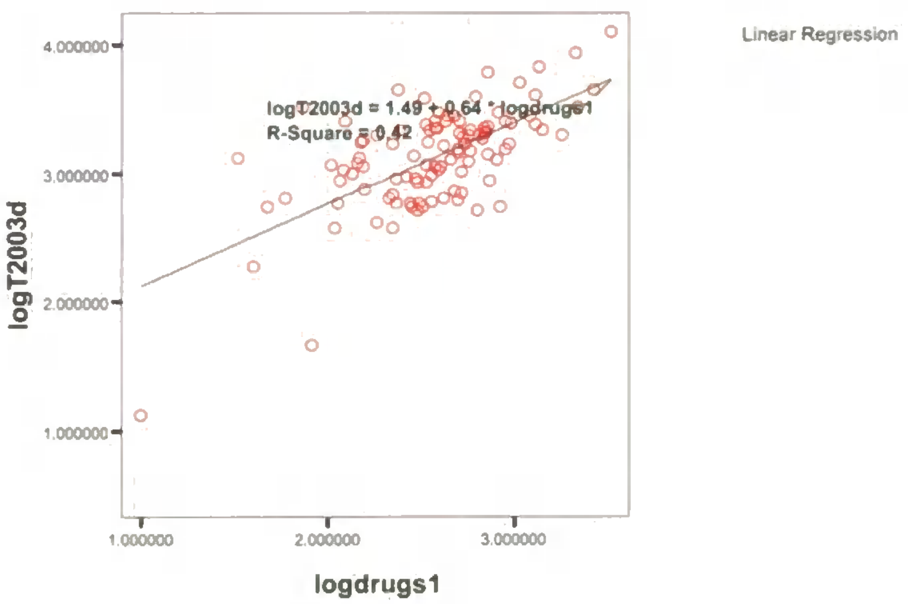
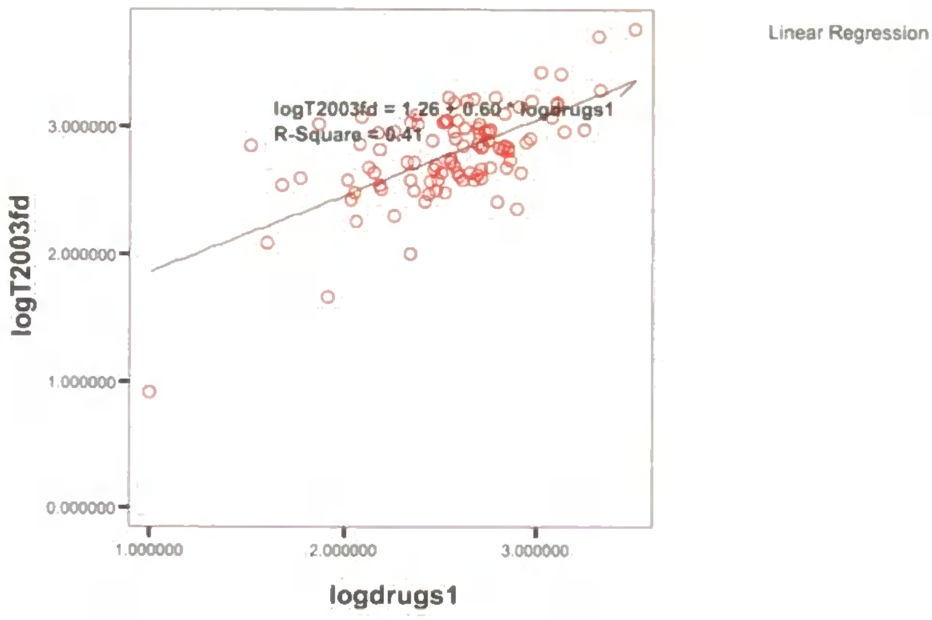


Figure 44 - Multivariate analysis - correlation statistics for County level variables and both dependent variables (continued)

Scatterplot for logdrugs1 and logT2003fd



Scatterplot for deinst7 and logT2003d

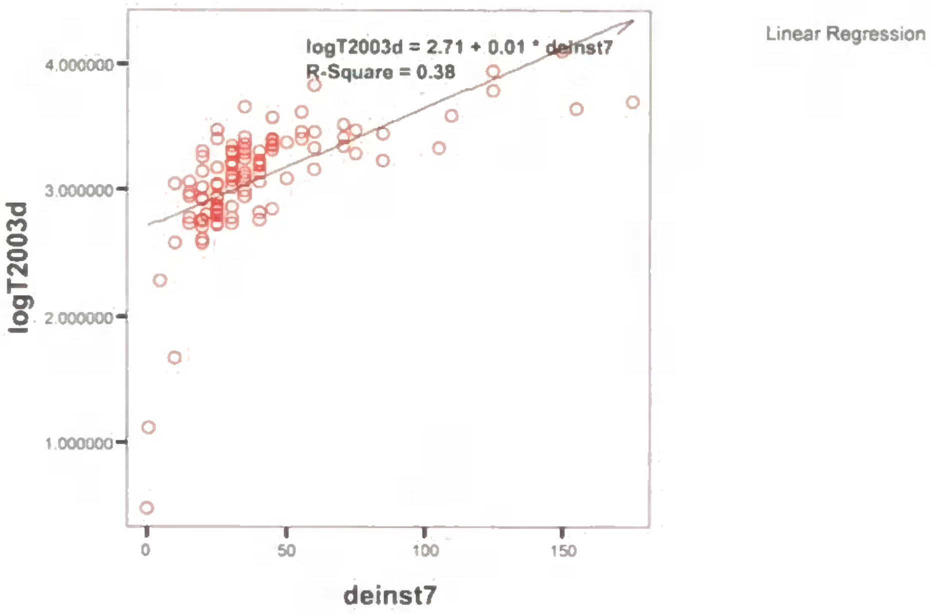


Figure 44 - Multivariate analysis - correlation statistics for County level variables and both dependent variables (continued)

Scatterplot for deinst7 and logT2003fd

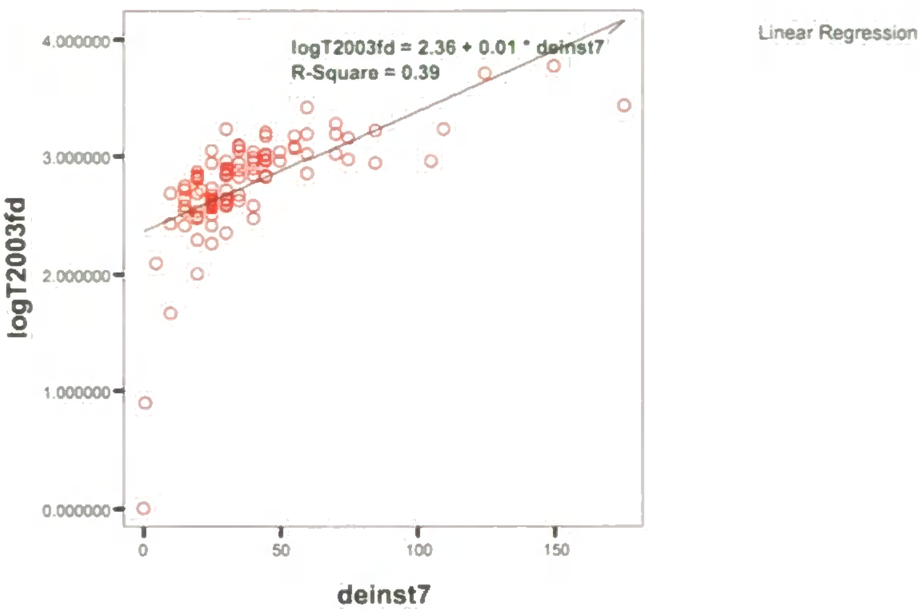


Figure 45 - Summary of variance in outcome variables explained by key independent variables and combinations of those variables – County level

One Independent variable	**R^2 value when regressed on logT2003fd[a]**	**R^2 value when regressed on logT2003d[a]**
Logdrugs1	.411	.417
Logrelationship1[a]	.788	.746
Logsexage3[a]	.652	.633
Deinst7	.390	.376

Two Independent variables	**R^2 value when regressed on logT2003fd[a]**	**R^2 value when regressed on logT2003d[a]**
Logrelationship1[a] and logdrugs1	.710	.679
Logrelationship1[a] and deinst7	.788	.746
Logsexaxge3[a] and logdrugs1	.661	.644
Logsexage3[a] and deinst7	.672	.639
Logdrugs1 and deinst7	.594	.555

Three Independent variables	**R^2 value when regressed on logT2003fd[a]**	**R^2 value when regressed on logT2003d[a]**
Logrelationship1[a] & logdrugs1 & deinst7	.771	.681
Logsexage3[a] & logdrugs1 & deinst7	.684	.651

All R^2 values are significant at p>0.01 level

Figure 46 - Multivariate analysis - distribution statistics and histograms for Local Authority level variables amalgamated to PCT level

Statistics

		sexage3b	relationship1b
N	Valid	198	199
	Missing	1	0
Mean		471.51	3680.58
Median		350.50	2976.00
Mode		216	1652[a]
Std. Deviation		373.213	2423.012
Variance		139288.0	5870989
Skewness		3.363	3.203
Std. Error of Skewness		.173	.172
Kurtosis		20.148	17.830
Std. Error of Kurtosis		.344	.343
Range		3357	21361
Minimum		63	691
Maximum		3420	22052

a. Multiple modes exist. The smallest value is shown

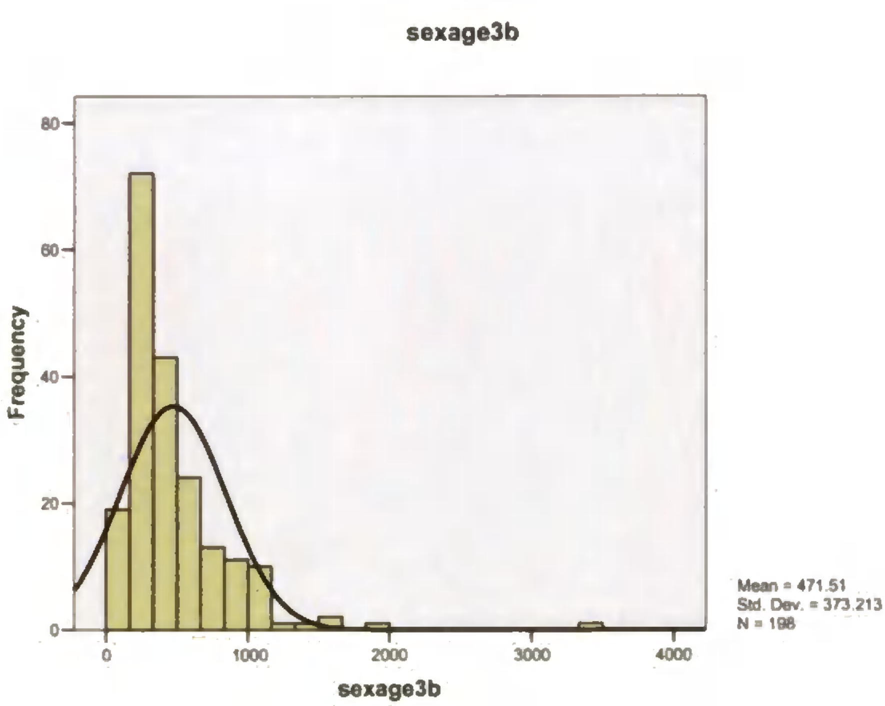


Figure 46 - Multivariate analysis - distribution statistics and histograms for Local Authority level variables amalgamated to PCT level (continued)

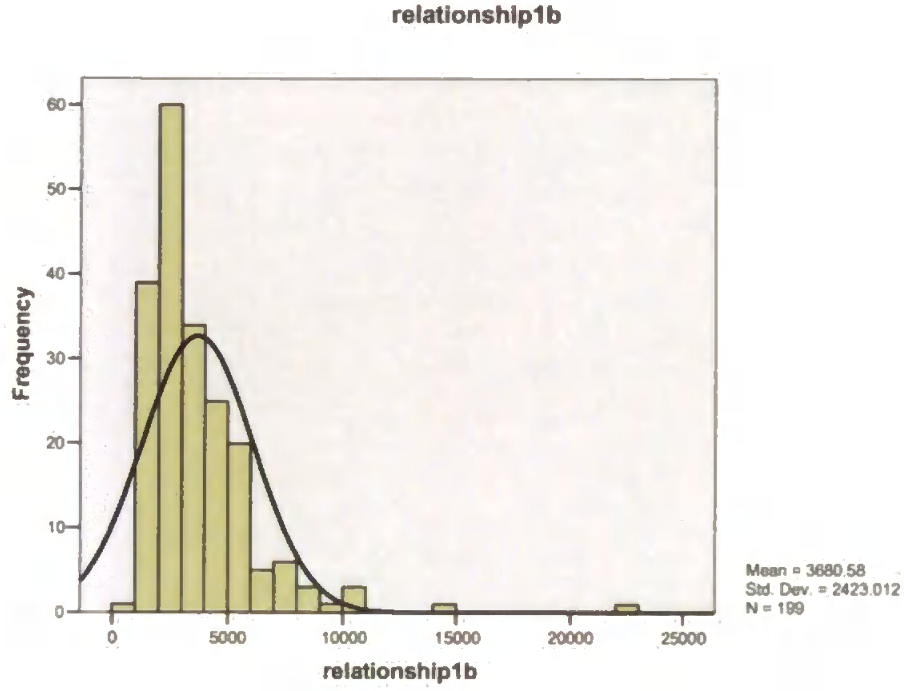


Figure 47 - Multivariate analysis - correlations and scatterplots for Local Authority Variables and remaining predictor variable at PCT level

Correlations

		logT2003db	logT2003fdb	logpoorhealth3	logsexage3b	logrelationship1b
logT2003db	Pearson Correlation	1	.921**	.616**	.799**	.776**
	Sig. (1-tailed)		.000	.000	.000	.000
	N	161	159	161	160	161
logT2003fdb	Pearson Correlation	.921**	1	.652**	.812**	.819**
	Sig. (1-tailed)	.000		.000	.000	.000
	N	159	159	159	158	159
logpoorhealth3	Pearson Correlation	.616**	.652**	1	.656**	.634**
	Sig. (1-tailed)	.000	.000		.000	.000
	N	161	159	199	198	199
logsexage3b	Pearson Correlation	.799**	.812**	.656**	1	.893**
	Sig. (1-tailed)	.000	.000	.000		.000
	N	160	158	198	198	198
logrelationship1b	Pearson Correlation	.776**	.819**	.634**	.893**	1
	Sig. (1-tailed)	.000	.000	.000	.000	
	N	161	159	199	198	199

**. Correlation is significant at the 0.01 level (1-tailed).

Scatterplot for logT2003fdb and logrelationship1b

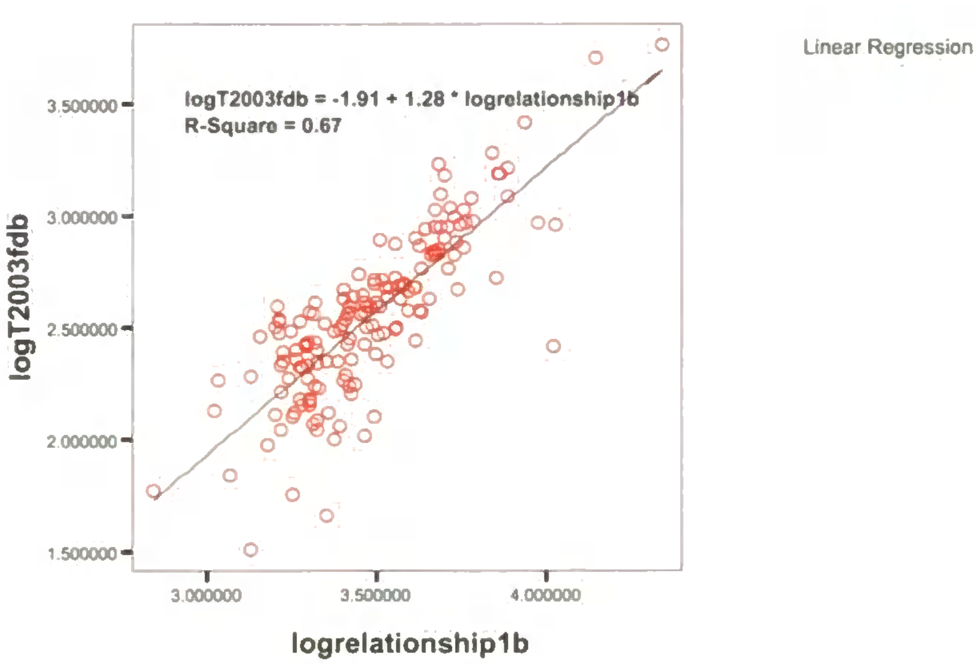
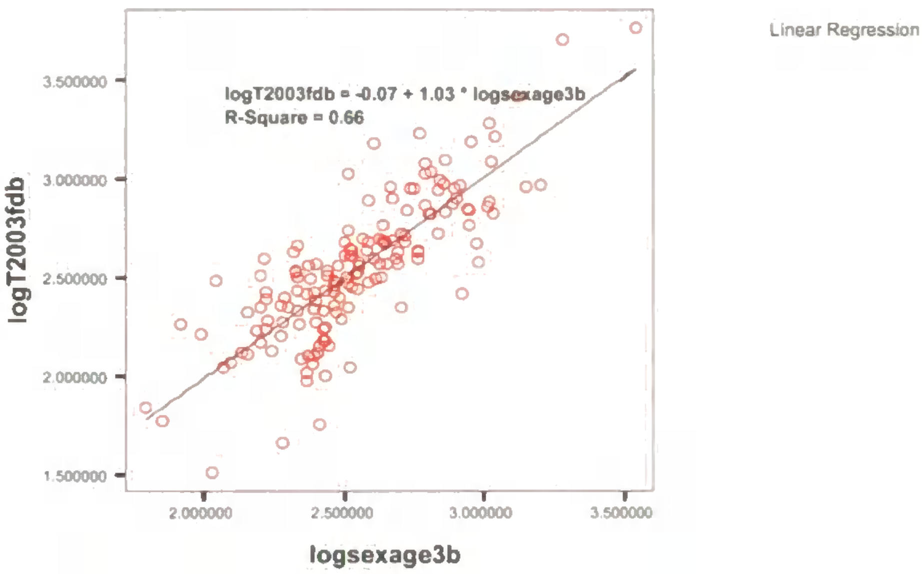


Figure 47 - Multivariate analysis - correlations and scatterplots for Local Authority Variables and remaining predictor variable at PCT level (contd.)

Scatterplot for logT2003fdb and logsexage3b



Scatterplot for logT2003fdb and logpoorhealth3

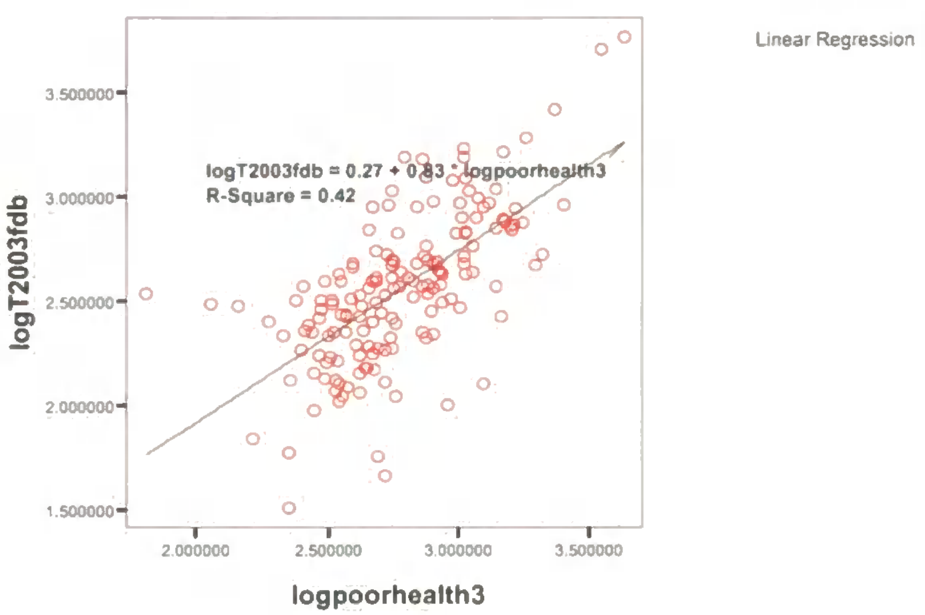
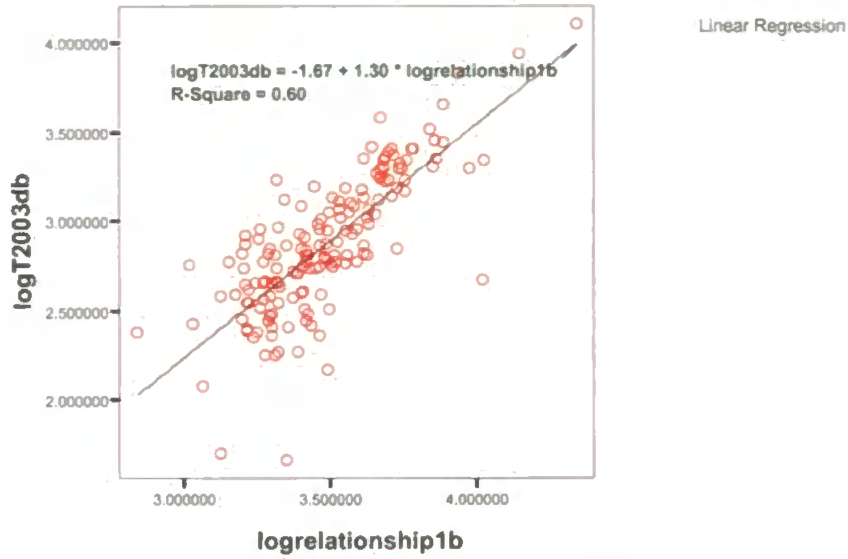


Figure 47 - Multivariate analysis - correlations and scatterplots for Local Authority Variables and remaining predictor variable at PCT level (contd.)

Scatterplot for logT2003db and logrelationship1b



Scatterplot for logT2003db and logsexage3b

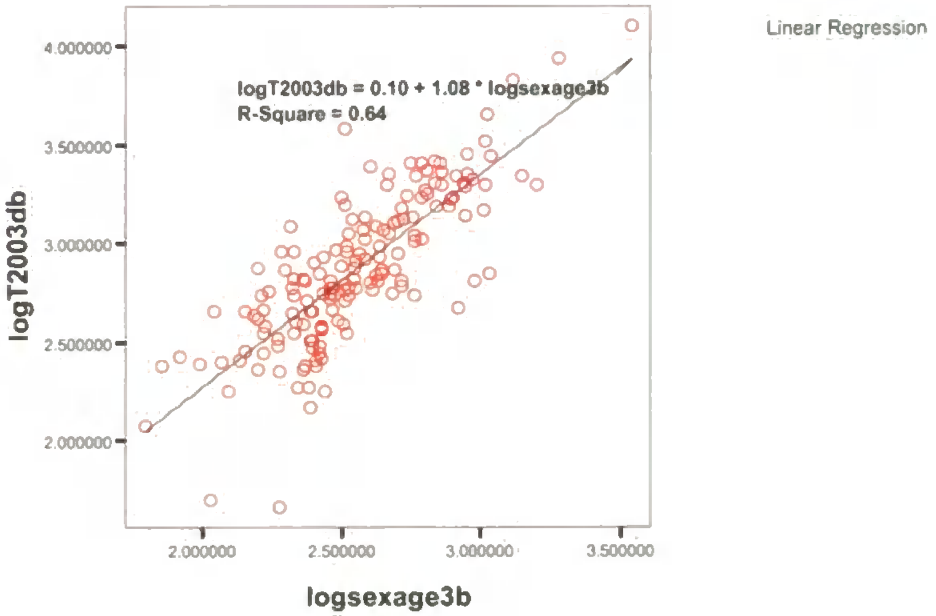


Figure 47 - Multivariate analysis - correlations and scatterplots for Local Authority Variables and remaining predictor variable at PCT level (contd.)

Scatterplot for logT2003db and logpoorhealth3

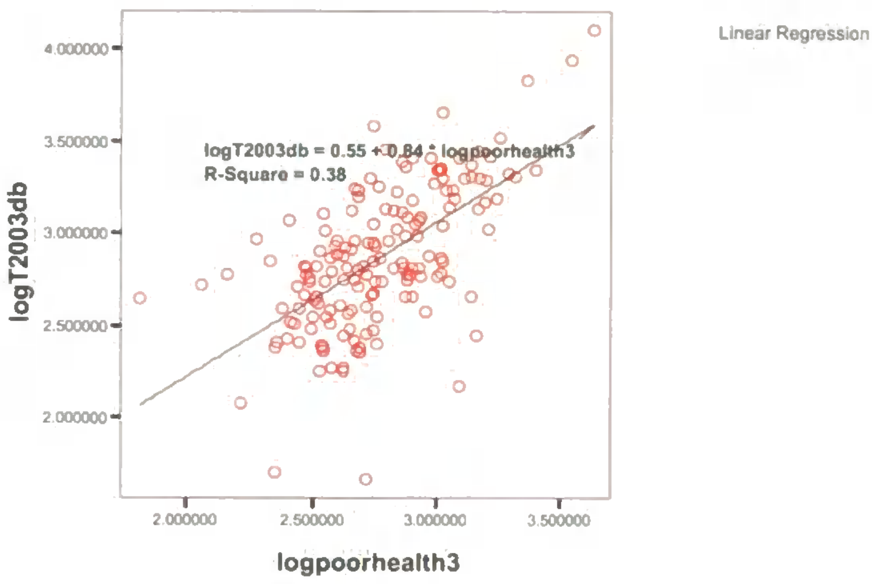


Figure 48 - Summary of variance in outcome variables explained by key independent variables and combinations of those variables – PCT level

One Independent variable	R^2 value when regressed on logT2003fd[b]	R^2 value when regressed on logT2003d[b]
Logpoorhealth3	.425	.380 (p>.05)
Logrelationship1[b]	.671	.506
Logsexage3[b]	.660	.639

All R^2 values are significant at p>0.01 level (one tailed) unless otherwise stated

Two Independent variables	R^2 value when regressed on logT2003fd[b]	R^2 value when regressed on logT2003d[b]
Logrelationship1[b] and logpoorhealth3	.710	.679
Logsexaxge3[b] and logpoorhealth3	.661	.644

All R^2 values are significant at p>0.01 level (one-tailed)

Glossary of terms and acronyms

Aggregated estimates – technique used by local authorities to estimate levels of homelessness in the area. Data from different front line service agencies working with homeless people is collated and used to draw inferences about missing data with a view to estimating the size of the total population.

Cook's distance – A measure of the overall influence of a case on the model.

CORE – Term used by the Housing Corporation to refer to the COntinuous REcording system that they operate which monitors rent social housing rent levels.

DCLG – Department for Communities and Local Government. The Governmental department responsible for housing and homelessness from 2006 to present day.

DETR – Department for the Environment, Transport and Regions. The Governmental department responsible for housing and homelessness from 1997 to 2001

DTLR – Department for Transport, Local Government and Regions. The Governmental department responsible for housing and homelessness from 2001 to 2002

Durbin-Watson statistics – Tests for serial correlations between errors in a regression model.

FEANTSA – European Federation of National Organisations working with the Homeless

HLPA – Housing Law Practitioners Association. A forum for practitioners working in the housing field to share knowledge and information.

Homoscedasticity – refers to the residuals of the model having the same variance at each level of the predictor variable.

IS – Income Support. A means tested benefit available to claimants who are unable to work.

JSACB – Job Seekers' Allowance, Contribution Based. A subsistence level benefit for a person who is available for and actively seeking work and who has paid sufficient national insurance contributions.

JSAIB – Job Seekers Allowance, Income Based. A means tested, subsistence level benefit for a person who is available for and actively seeking work but who has not paid sufficient national insurance contributions to qualify for JSACB.

KMO – Kaiser-Meyer-Olkin. This is a measure of sampling adequacy. It represents the ratio of the squared correlation between variables to the squared partial correlation between variable.

NASS – National Asylum Support Service. Government department responsible for assessing claims for residency from people seeking asylum in Britain.

NHS NTA – National Health Service National Treatment Agency for Substance Misuse. A special health authority within the NHS, established by Government in 2001 to improve the availability, capacity and effectiveness of treatment for drug misuse in England.

ODPM – Office of the Deputy Prime Minister. The Governmental department responsible for housing and homelessness from 2002 to 2006

ONS - Office for National Statistics. The Government department responsible for collecting and publishing official statistics about the UK's society.

PCT – Primary Cary Trust. A local health organisation responsible for managing local health services.

RSI – Rough Sleepers' Initiative. A government initiative between 1990 and 1999 designed to reduce the numbers of people sleeping rough in England.

RSL Registered Social Landlord. A housing association or a not for profit company registered by the Housing Corporation to provide social housing.

RSU – Rough Sleepers' Unit. A department established within the government Department for Environment, Transport and Regions, set up specifically to try to address the problem of rough sleeping.

SEU – Social Exclusion Unit. A department established within the Office of the Deputy Prime Minister, set up specifically to try to address the issue of social exclusion.

SPSS – Statistical Package for Social Scientists. A computer application that provides statistical analysis of data.

Targeted census - a technique used by local authorities to estimate levels of homelessness in the area. Data from identified front line service agencies working with homeless people is collated used as a measure of the size of the total population of homeless people.

TPB – Theory of planned behaviour. A theory about the link between attitudes and behaviour proposed by Icek Ajzen.

Appendix 1a: Introductory letter to Local Authorities

Dear Sir / Madam

STRATEGIC PLANNING OF HOMELESSNESS SERVICES

My name is Louise Forty and I am at Plymouth University working to improve methods of strategic planning of services. I have worked in the field of homelessness for over a decade and I'm now hoping to produce a statistical tool that will assist Local Authorities in their strategic planning of services for homeless people.

I am writing to ask for your help. I need about ten minutes of your time.

There are two attachments to this email:

1. **Briefing.** This is a brief outline of my research (1 page), detailing the main objectives of the research as well as an overview of the principles to which I am working. I would be grateful if you would read this attachment first.
2. **Local Authority Survey.** This is a very brief survey exploring current practice in determining service provision for homeless people. I would be grateful if you could take the time to complete the survey. It is only 1 page long and should take no more than 5 minutes to complete.

I am also interested in any research or assessment reports that your Council has commissioned or has contributed to within the last ten years around quantifying the size of the homeless problem in your particular Council area. I would be grateful if you could send me a copy of any local reports you may have on this subject area. Please let me know if there is a charge for any copies. All responses will be treated in the strictest confidence as detailed in the briefing.

I hope you feel able to assist with this doctoral project as a positive outcome would, I'm sure, be beneficial to all involved. If you feel however that someone else within your authority would be better placed to respond to this email I would be very grateful if you would kindly forward it to them. Thank you for your time. I hope to hear from you, **ideally by 11th March 2005**.

Yours faithfully

Louise Forty
PhD Student

Appendix 1b: Research Briefing for Local Authorities

Briefing

Project details

Aim

The aim of the research is to try to provide a tool for predicting need, for use by Local Authorities in the strategic planning of their services for homeless people.

Objectives

- To provide some element of standardisation in the strategic approach to homelessness across the country.
- To facilitate resource management and planning around the issue of homelessness in each Local Authority area.
- To provide a starting point to Local Authorities who may have difficulties in assessing and predicting need in this area due to lack of expertise, resources or political will.
- To provide Local Authorities with an independent measure which they can use to help explain or justify resource requirements or expenditure to funders, Central Government or other stakeholders.
- To improve services for homeless people across the country by enabling Local Authorities to take a more positive and strategic approach to the issue with a view to reducing social exclusion.

The research will examine data that is already available on various subject areas within Local Authority areas, comparing levels of homelessness and patterns in homelessness in each Local Authority area with other key influencing factors (such as levels of poverty, poor health or educational attainment in an area) – both structural and individual, to determine whether there are any significant correlations or patterns that can be identified. Techniques for multivariate analysis will be used to explore relationships between factors and levels of homelessness. Statistical modelling will be employed and models will be tested for validity and reliability against historical information from Local Authority areas in the sample. If a model looks feasible, it is hoped that there will be an opportunity to check the validity and reliability of the model by piloting it in the "real world" prior to publication.

Principles of working

The researcher will be working in accordance with the ethical policies of the Social Research Association and the Institute of Housing.

Right to withdraw. Every Local Authority in the sample will have a right to withdraw from the research at any time during participation in the research.

Confidentiality: All information supplied by individuals or Local Authorities will be held confidentially and neither the individuals nor the Local Authorities will be identifiable in the research report without their express consent. Data will be destroyed at the end of the project in compliance with the Data Protection Act.

Debriefing: A summary of the research would be provided to Local Authorities in time for possible use in the revision of their homelessness strategies, due for completion in 2008. Each participating Local Authority will be given an opportunity to ask questions and give feedback as the research draws to a close.

Accountability:

Any concerns about the research should be addressed to the researcher in the first instance. If a satisfactory outcome is not reached, please contact the researcher's supervisor; Mr Malcolm Williams, Reader, Department of Sociology, Plymouth University, Drakes Circus, Plymouth, PL4 8AA

Appendix 1c: Local Authority Questionnaire

Local Authority Survey

Name of Local Authority

Current Practice
How do you estimate future demand for homelessness services in your Local Authority area?

Use and awareness of existing methods
Please indicate your awareness and use of the methods detailed below by marking the relevant boxes with an **X**. Please also indicate how adequate you consider the method to be where;
1 = perfectly adequate, 2 = reasonably adequate, 3 = inadequate and 4 = very inadequate.
Please respond to each method listed.

	Use regularly	Use occasionally	Heard of but don't use	Not heard of or used	adequacy
Past P1E returns / experience					
Census / population data					
Street counts					
Capture / recapture methods					
Consultation with local agencies					
Predictive statistical models					
Other (please state)					

Interest in new methods
Would your Council be willing to consider other practical methods of estimating need?
Yes No Not sure

Influences
Please indicate to what extent the factors listed below influence resource allocation within your department by marking the relevant boxes. Please respond to each factor listed.

	Strong influence	Some influence	Minimal influence
Demand for services			
Budget limitations			
Local Councillor attitudes / beliefs			
Council Officer attitudes / beliefs			
Local public opinion			
Other (please state)			

Contact name and telephone number (optional):

Thank you for taking the time to respond to this survey. Please email the completed form back to louise.forty@plymouth.ac.uk

Appendix 1d: Chaser correspondence

Chaser 1
Dear Sir / Madam

I recently emailed you with a request for information about how you estimate future demand for homeless services in your Local Authority area. This is a gentle reminder to ask you for a response if at all possible. I appreciate that you are really busy and would like to reassure you that the survey will genuinely only take about 5 – 10 minutes of your time and that a survey response from you will not lead to further time commitment from you or further questions from me.

I have attached another copy of the survey in case the first one has been filed away. Please respond if you can. Thank you in anticipation.

Best wishes
Louise Forty
Plymouth University Student

Chaser 2a
Dear Sir / Madam

I recently emailed you with a request for information about how you estimate future demand for homeless services in your Local Authority area.

It's not too late to reply! This is a final call to ask if you can spare just a few minutes to complete the survey. The response rate has been good but the survey results will be more informative and hopefully more useful if they can include a response from your authority.

I have attached another copy of the survey for your convenience and would be really pleased to hear from you if at all possible.

Thank you in anticipation.

Best wishes
Louise Forty
Plymouth University Student

Chaser 2b
Dear Sir / Madam

Your Council has previously indicated that it may be able to respond to the homeless services survey sent recently. However I don't seem to have had a survey response from you yet. I am contacting you because you have either forwarded the survey to a colleague for completion or you are the person who has ended up with the survey!

It's not too late to reply! This is a final call to ask if you can spare just a few minutes to complete the survey. The response rate has been good but the survey results will be more informative and hopefully more useful if they can include a response from your authority.

I have attached another copy of the survey for your convenience and would be really pleased to hear from you if at all possible.

Thank you in anticipation.

Best wishes
Louise Forty
Plymouth University Student

Appendix 1d: Chaser correspondence (contd.)

Chaser 3a/b
Dear Sir / Madam,

I recently sent each Local Authority in the country a short survey asking about how future demand for homeless services is estimated. Although response has generally been very good, after initial analysis, it seems that the response rate has been much lower from London / Unitary Authorities – possibly because everyone is so busy! This email is consequently a final plea to ask if you could reconsider spending just a few minutes completing the attached survey. I know you must be really busy but I assure you that it will only take five minutes of your time and a response from your authority would be greatly appreciated.

Thank you in hopeful anticipation. I hope to hear from within the next few days if at all possible.

Yours faithfully

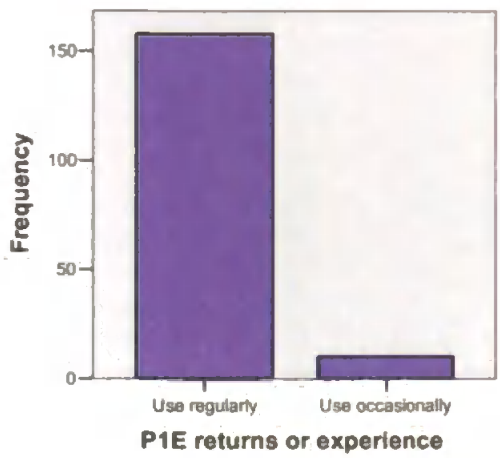
Louise Forty
Plymouth University Student

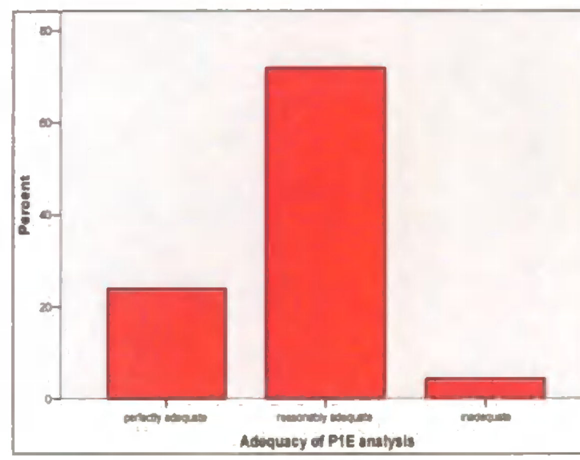
Appendix 1e: Summary of questionnaire results for Local Authorities

A questionnaire was sent to 349 Local Authorities asking about how they estimate future demand for homeless services. A total of 168 Local Authorities returned a completed questionnaire. This is a brief summary of the results.

Local Authorities were asked about their use of existing methods for predicting future demand as well as how adequate these methods were perceived to be. The graphs below show the results of these questions.

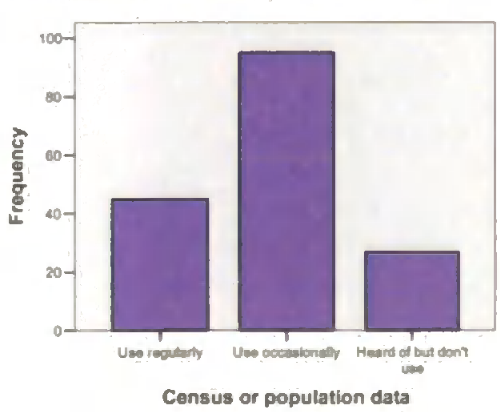
P1E returns

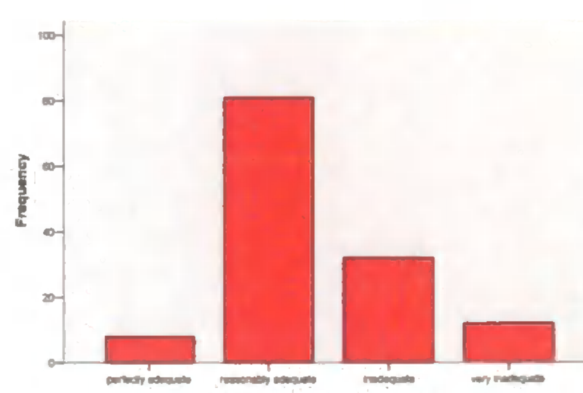




The vast majority (94%) of Local Authorities regularly used past P1E returns to estimate likely future demand. Only 24% of authorities using this method regularly felt it was perfectly adequate. The ODPM recognises that an analysis of P1E figures to develop the analysis of the local homeless population is a limited approach which could exclude many sectors of the homeless population[1].

Census or other demographic data

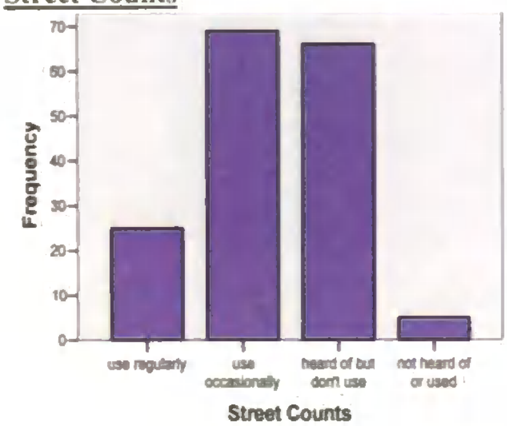




Only 27% of Local Authorities regularly used census or other demographic data when considering future demand for homeless services. Of these regular users, only 10% considered the method to be perfectly adequate. In evaluating the Homeless Strategies, the government recognised that this apparent reluctance to engage in anything more than basic statistical analysis may be due to a lack of skills base within homelessness departments.

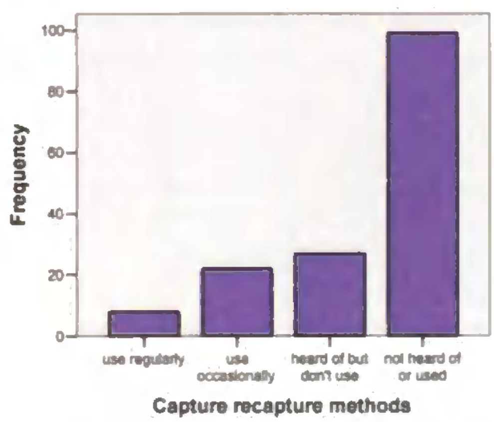
Appendix 1e: Summary of questionnaire results for Local Authorities (contd.)

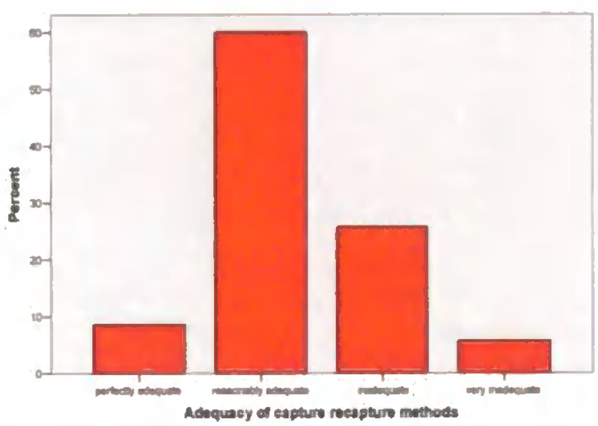
Street Counts



Only 15% of respondent councils said they regularly used street counts as a way of estimating future demand for homeless services with just 14% of these considering it a perfectly adequate method. It is widely acknowledged that periodic street counts can only ever provide a very limited snapshot of a particular group of the homeless population. This method underestimates the size of the rough sleeping problem, particularly in rural areas, and the extent of underestimation is suggested as being as high as a factor of ten (Kenway & Palmer, 2003[2]).

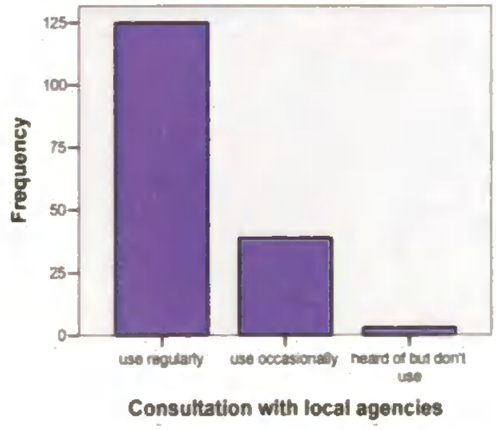
Capture / recapture models

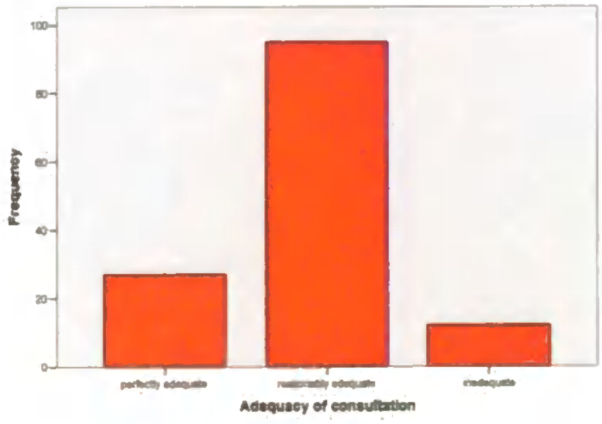




Only 5% of authorities use this method regularly for future planning. 59% of authorities had not heard of this method before. This method has provided reliable estimates of current levels of rough sleeping but its use has not been extended to the wider spectrum of homelessness or to future planning.

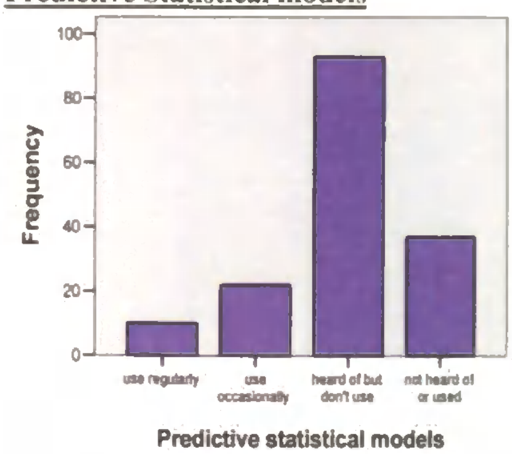
Consultation with local agencies

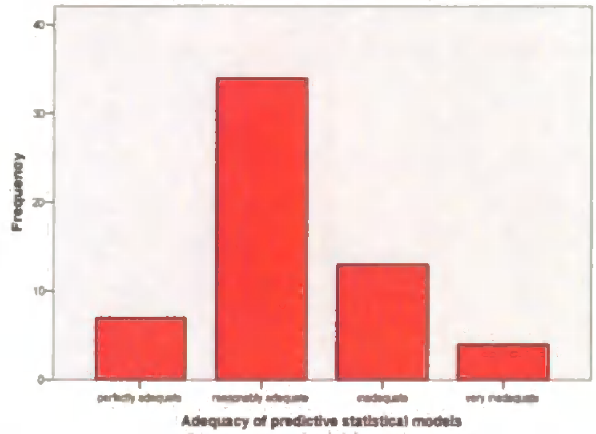




74% of authorities regularly used consultation with local agencies as a method for estimating future demand for homeless services however only 24% of these authorities felt this method to be perfectly adequate. Different agendas and monitoring systems often make data transfer difficult. There are also issues of confidentiality involved. Central Government encourage the development of common monitoring systems to try to minimise these difficulties.

Predictive Statistical models





Only 6% of respondents used this method regularly. Such methods have not been widely tested in the field and a significant number of Local Authorities are not aware of the methods available. The limited number of models available vary in their conclusions and their approach to homelessness.

Other indicators

Approximately 6% of responding authorities used analysis of what they considered to be the main drivers of homelessness – mainly poverty and economic trends including interest rate changes and unemployment levels – to assist in estimating future demand for homeless services. Approximately 10% of Local Authorities identified links between homelessness and fluctuations in the property market and a small number of authorities considered rates of teenage pregnancies as a useful indicator of future demand on their services. Other methods highlighted included monitoring temporary accommodation use, waiting lists and the flow of available properties. Housing needs surveys were also used by approximately 13% of responding councils. A very small number of authorities contracted external providers for assessment of future demand and these tended to use demographic profiling as the basis for their projections. 4% of authorities said their forward planning was based on monitoring current trends. 7% of authorities commented that estimating future demand was either extremely or very difficult and a small number (2%) bravely admitted to not making future predictions at all.

Interest in other methods

83% of authorities said they would be interested in other methods for estimating future demand with a further 14% being unsure. The uncertainty was usually qualified by concerns over resource implications and whether any proposed method was acceptable to Central Government.

Influences on resources

81% of responding councils stated that demand for services had a strong influence on resource allocation. However, 80% of councils said that budget limitations also had a strong influence over resource allocation. This raises the question of whether budgetary limitations are curtailing the statutory duties of Local Authorities, possibly forcing them to make restrictive interpretations of the legislation. 25% of councils said that local councillor attitudes and beliefs had a strong influence over resource allocation within their department. 12% of councils said that local public opinion had a strong influence. Whilst any individual or group of individuals have a significant influence over resource allocation the system will be open to subjective judgements and potential prejudice.

[1] ODPM, (2004) Local Authorities' Homelessness Strategies: Evaluation and Good Practice. London: ODPM.
[2] Kenway, P. & Palmer, G. (2003) How Many, How Much – Single homelessness and the question of numbers and cost. London: Crisis.

Appendix 2 - Master list of all variables

level	Details of indicator	code
LA	p1e returns 2000/ 2001 second quarter number of decisions taken	T2d
	p1e returns 2000/ 2001 fourth quarter number of decisions taken	T4d
	p1e returns 2000/2001 first quarter number of applications where full duty accepted	T1f
	p1e returns 2000/ 2001 second quarter number of applications where full duty accepted	T2f
	p1e returns 2000/2001 fourth quarter number of applications where full duty accepted	T4f
	p1e returns 2001/ 2002 first quarter number of decisions taken	T5d
	p1e returns 2001/ 2002 second quarter number of decisions taken	T6d
	p1e returns 2001/ 2002 third quarter number of decisions taken	T7d
	p1e returns 2001/ 2002 fourth quarter number of decisions taken	T8d
	p1e returns 2001/ 2002 total number of decisions taken	T2001d
	p1e returns 2001/2002 first quarter number of applications where full duty accepted	T5f
	p1e returns 2001/ 2002 second quarter number of applications where full duty accepted	T6f
	p1e returns 2001/ 2002 third quarter number of applications where full duty accepted	T7f
	p1e returns 2001/2002 fourth quarter number of applications where full duty accepted	T8f
	p1e returns 2001/ 2002 total number of applications where full duty accepted	T2001f
	p1e returns 2002/ 2003 first quarter number of decisions taken	T9d
	p1e returns 2002/ 2003 second quarter number of decisions taken	T10d
	p1e returns 2002/ 2003 third quarter number of decisions taken	T11d
	p1e returns 2002/ 2003 fourth quarter number of decisions taken	T12d
	p1e returns 2002/ 2003 total number of decisions taken	T2002d
	p1e returns 2002/2003 first quarter number of applications where full duty accepted	T9f
	p1e returns 2002/ 2003 second quarter number of applications where full duty accepted	T10f
	p1e returns 2002/ 2003 third quarter number of applications where full duty accepted	T11f
	p1e returns 2002/2003 fourth quarter number of applications where full duty accepted	T12f
	p1e returns 2002/ 2003 total number of applications where full duty accepted	T2002f
	p1e returns 2003/ 2004 first quarter number of decisions taken	T13d
	p1e returns 2003/ 2004 second quarter number of decisions taken	T14d
	p1e returns 2003/ 2004 third quarter number of decisions taken	T15d
	p1e returns 2003/ 2004 fourth quarter number of decisions taken	T16d
	p1e returns 2003/ 2004 total number of decisions taken	T2003d
	p1e returns 2003/2004 first quarter number of applications where full duty accepted	T13f
	p1e returns 2003/ 2004 second quarter number of applications where full duty accepted	T14f
	p1e returns 2003/ 2004 third quarter number of applications where full duty accepted	T15f

Appendix 2 - Master list of all variables

	p1e returns 2003/2004 fourth quarter number of applications where full duty accepted	T16f
	p1e returns 2003/ 2004 total number of applications where full duty accepted	T2003f
	p1e returns 2004/ 2005 first quarter number of decisions taken	T17d
	p1e returns 2004/ 2005 second quarter number of decisions taken	T18d
	p1e returns 2004/ 2005 third quarter number of decisions taken	T19d
	p1e returns 2004/ 2005 fourth quarter number of decisions taken	T20d
	p1e returns 2004/ 2005 total number of decisions taken	T2004d
	p1e returns 2004/2005 first quarter number of applications where full duty accepted	T17f
	p1e returns 2004/ 2005 second quarter number of applications where full duty accepted	T18f
	p1e returns 2004/ 2005 third quarter number of applications where full duty accepted	T19f
	p1e returns 2004/2005 fourth quarter number of applications where full duty accepted	T20f
	p1e returns 2004/ 2005 total number of applications where full duty accepted	T2004f
	For county level analysis, dependent variable data was amalgamated & coded as above with superscript a	
	For PCT level analysis, dependent variable data was amalgamated & coded as above with superscript b	
LA	Size in hectares	gen1
	Total population	gen2
	number of males	gen3
	number of females	gen4
	Council type	gen5
	2001 Density (number of people per hectare)	gen6
	size in hectares (grouped)	gen1gp
	Total population (grouped)	gen2gp
	% intercensal population change (1991-2001)	migration1
	Lived elsewhere outside the area but within the associated area	migration2
	Lived elsewhere outside the area but within the UK	migration3
	All armed forces persons (living in households or communal establishments in the area)	deinst1
	Number of 16 and 17 year olds as at 21st April 2001	sexage1
	No qualifications	sexage2
	Number of under 18 conceptions 1998-2000	sexage3
	Number of under 18 conceptions 2001-2003	sexage4
	Number of Income Support claimants under 20 as at August 2000	sexage5
	Number of Income Support claimants under 20 as at August 2001	sexage6
	Number of Income based Job Seekers Allowance Claimants under 20 as at August 2000	sexage7

Appendix 2 - Master list of all variables

	Number of Income based Job Seekers Allowance Claimants under 20 as at August 2001	sexage8
	Social Housing Rents - mean of all dwellings gross rent as at 31st March 2002	housing1
	Social Housing Rents - mean of one bedroom, RSL gross rent as at 31st March 2002	housing2
	Social Housing Rents - mean of three bedrooms, RSL gross rent as at 31st March 2002	housing3
	white population (amalgamated)	ethnicity1
	mixed race population (almagamated)	ethnicity2
	asian population (amalgamated)	ethnicity3
	black population (amalgamated)	ethnicity4
	total non-white population (amalgamated)	ethnicity5
	Violence against the person - notifiable offences recorded by the police April 2000-March 2001	deinst15
	Burglary from a dwelling - notifiable offences recorded by the police April 2000-March 2001	deinst16
	Theft of a motor vehicle - notifiable offences recorded by the police April 2000 - March 2001	deinst17
	Theft from a motor vehicle - notifiable offences recorded by the police April 2000- March 2001	deinst18
	Separated (but still legally married) as at 21st April 2001	relationship1
	Divorced as at 21st April 2001	relationship2
	widowed as at 21st April 2001	relationship3
	Total relationship breakdowns (separated + divorced + widowed)	relationship4
	No of people with no religion	relationship5
	Total number of Income Support claimants as at August 2000	poverty1
	Total number of Income Support claimants as at August 2001	poverty2
	Total number of claimants for Income based Job Seekers Allowance as at August 2000	poverty3
	Total number of claimants for Income based Job Seekers Allowance as at August 2001	poverty4
	Number of people aged 16-74 who have never worked or who are long term unemployed (amalgamated)	poverty5
	Number of people aged 16-74 who are economically inactive (amalgamated)	poverty6
	Number of people with limiting long term illness	poorhealth1
County	children in need receiving services in 2000 (during a typical week in february 2000)	deinst2
	children in need receiving services in 2001(during a typical week in sept/oct 2001)	deinst3
	Children ceasing to be looked after during the year ending 31st March 2000	deinst4
	Children ceasing to be looked after during the year ending 31st March 2001	deinst5
	young people who ceased to be looked after during year ending 31/3/2000	deinst6
	young people who ceased to be looked after during year ending 31/3/2001	deinst7
	young people who ceased to be looked after during year ending 31/3/2002	deinst8
	young people who ceased to be looked after during year ending 31/3/2003	deinst9

Appendix 2 - Master list of all variables

	young people who ceased to be looked after during year ending 31/3/2004	deinst10
	Guardianship under the Mental Health Act 1983 - cases closed during year ending 31/3/2000	deinst11
	Guardianship under the Mental Health Act 1983 - cases open as at 31/3/2000	deinst12
	Guardianship under the Mental Health Act 1983 - cases closed during year ending 31/3/2001	deinst13
	Guardianship under the Mental Health Act 1983 - cases open as at 31/3/2001	deinst14
	average price of semi-detached property 2000	housing4
	average price of semi-detached property 2001	housing5
	average price of a flat 2000	housing6
	average price of a flat 2001	housing7
	average residential property price 2000	housing8
	average residential property price 2001	housing9
	number of people in contact with drug treatment agency 2003/4 using heroin as their main drug	drugs1
	number of people in contact with drug treatment agency 2003/4 using methadone as their main drug	drugs2
	number of people in contact with drug treatment agency 2003/4 using amphetamine as their main drug	drugs3
	number of people in contact with drug treatment agency 2003/4 using crack as their main drug	drugs4
	number of people in contact with drug treatment agency 2003/4 using cannabis as their main drug	drugs5
	total number of people in contact with drug treatment agency 2003/4 using any drug as their main drug	drugs6
PCT	Total mental illness admissions April 2002-March 2003	poorhealth2
	Total mental illness discharges April 2002 - March 2003	poorhealth3

Appendix 2 - Master list of all variables - source details

code	Source
T2d	Office of the Deputy Prime Minister
T4d	Office of the Deputy Prime Minister
T1f	Office of the Deputy Prime Minister
T2f	Office of the Deputy Prime Minister
T4f	Office of the Deputy Prime Minister
T5d	Office of the Deputy Prime Minister
T6d	Office of the Deputy Prime Minister
T7d	Office of the Deputy Prime Minister
T8d	Office of the Deputy Prime Minister
T2001d	Office of the Deputy Prime Minister
T5f	Office of the Deputy Prime Minister
T6f	Office of the Deputy Prime Minister
T7f	Office of the Deputy Prime Minister
T8f	Office of the Deputy Prime Minister
T2001f	Office of the Deputy Prime Minister
T9d	Office of the Deputy Prime Minister
T10d	Office of the Deputy Prime Minister
T11d	Office of the Deputy Prime Minister
T12d	Office of the Deputy Prime Minister
T2002d	Office of the Deputy Prime Minister
T9f	Office of the Deputy Prime Minister
T10f	Office of the Deputy Prime Minister
T11f	Office of the Deputy Prime Minister
T12f	Office of the Deputy Prime Minister
T2002f	Office of the Deputy Prime Minister
T13d	Office of the Deputy Prime Minister
T14d	Office of the Deputy Prime Minister
T15d	Office of the Deputy Prime Minister
T16d	Office of the Deputy Prime Minister
T2003d	Office of the Deputy Prime Minister
T13f	Office of the Deputy Prime Minister
T14f	Office of the Deputy Prime Minister
T15f	Office of the Deputy Prime Minister

Appendix 2 - Master list of all variables - source details

T16f	Office of the Deputy Prime Minister
T2003f	Office of the Deputy Prime Minister
T17d	Office of the Deputy Prime Minister
T18d	Office of the Deputy Prime Minister
T19d	Office of the Deputy Prime Minister
T20d	Office of the Deputy Prime Minister
T2004d	Office of the Deputy Prime Minister
T17f	Office of the Deputy Prime Minister
T18f	Office of the Deputy Prime Minister
T19f	Office of the Deputy Prime Minister
T20f	Office of the Deputy Prime Minister
T2004f	Office of the Deputy Prime Minister
gen1	Office for National Statistics - census 2001 - Key statistics KS01
gen2	Office for National Statistics - census 2001 - Key statistics KS01
gen3	Office for National Statistics - census 2001 - Key statistics KS01
gen4	Office for National Statistics - census 2001 - Key statistics KS01
gen5	Individual council titles
gen6	Office for National Statistics - census 2001 - Key statistics KS01
gen1gp	Office for National Statistics - census 2001 - Key statistics KS01 (grouped)
gen2gp	Office for National Statistics - census 2001 - Key statistics KS01 (grouped)
migration1	Office for National Statistics - Census 2001 - Key Statistics KS01
migration2	Office for National Statistics - Census 2001 - Census Area Statistics UV23
migration3	Office for National Statistics - Census 2001 - Census Area Statistics UV23
deinst1	Office for National Statistics - Census 2001 - Census Area Statistics UV81 armed forces
sexage1	Office for National Statistics - Census 2001 - Key Statistics KS02
sexage2	Office for National statistics - Census 2001 - Census Area Statistics UV24 (2003 administrative hierarchy)
sexage3	Office for National Statistics - conception statistics - www.statistics.gov.uk
sexage4	Office for National Statistics - conception statistics - www.statistics.gov.uk
sexage5	Census Area Statistics
sexage6	Census Area Statistics
sexage7	Census Area Statistics
sexage8	Census Area Statistics
housing1	Census - ODPM - Housing Statistics / HDS8

Appendix 2 - Master list of all variables - source details

housing2	Census - ODPM - Housing Statistics / HDS8
housing3	Census - ODPM - Housing Statistics / HDS8
ethnicity1	Office for national Statistics - census 2001 - Key Statistics KS06
ethnicity2	Office for national Statistics - census 2001 - Key Statistics KS06
ethnicity3	Office for national Statistics - census 2001 - Key Statistics KS06
ethnicity4	Office for national Statistics - census 2001 - Key Statistics KS06
ethnicity5	Office for national Statistics - census 2001 - Key Statistics KS06
deinst15	Census Area Statistics
deinst16	Census Area Statistics
deinst17	Census Area Statistics
deinst18	Census Area Statistics
relationship1	Office for National Statistics - Census 2001 - Census Area Statistics - KS04
relationship2	Office for National Statistics - Census 2001 - Census Area Statistics - KS04
relationship3	Office for National Statistics - Census 2001 - Census Area Statistics - KS04
relationship4	Office for National Statistics - Census 2001 - Census Area Statistics - KS04
relationship5	Office for National Statistics - census 2001 - Key Statistics KS07
poverty1	Census Area Statistics
poverty2	Census Area Statistics
poverty3	Census Area Statistics
poverty4	Census Area Statistics
poverty5	Office for National Statistics - Census 2001 - Key Statistics KS09a
poverty6	Office for National Statistics - Census 2001 - Key Statistics KS09a
poorhealth1	Office for National Statistics - Census 2001 - Key Statistics KS08
deinst2	Department of Health - www.dh.gov.uk/PublicationsAndStatistics/Statistics/Statistical Work Areas/Statisitics
deinst3	Department of Health - www.dh.gov.uk/PublicationsAndStatistics/Statistics/Statistical Work Areas/Statisitics
deinst4	Department of Health - www.dh.gov.uk/en/Publicationsandstatistics/Statistics/statisticalsocialcare/DH-4015849
deinst5	Department of Health - www.dh.gov.uk/en/Publicationsandstatistics/Statistics/statisticalsocialcare/DH-4015849
deinst6	Department for education and skills - www.dfes.gov.uk/
deinst7	Department for education and skills - www.dfes.gov.uk/
deinst8	Department for education and skills - www.dfes.gov.uk/
deinst9	Department for education and skills - www.dfes.gov.uk/
deinst10	Department for education and skills - www.dfes.gov.uk/
deinst11	Department of Health - www.dh.gov.uk/PublicationsAndStatistics/Statistics/Statistical Work Areas/Statisitics

Appendix 2 - Master list of all variables - source details

deinst12	Department of Health - www.dh.gov.uk/PublicationsAndStatistics/Statistics/Statistical Work Areas/Statisitics
deinst13	Department of Health - www.dh.gov.uk/PublicationsAndStatistics/Statistics/Statistical Work Areas/Statisitics
deinst14	Department of Health - www.dh.gov.uk/PublicationsAndStatistics/Statistics/Statistical Work Areas/Statisitics
housing4	HM Land Registry - www.landreg.gov.uk
housing5	HM Land Registry - www.landreg.gov.uk
housing6	HM Land Registry - www.landreg.gov.uk
housing7	HM Land Registry - www.landreg.gov.uk
housing8	HM Land Registry - www.landreg.gov.uk
housing9	HM Land Registry - www.landreg.gov.uk
drugs1	NHS National Treatment Agency for Substance Misuse - www.nta.nhs.uk/areas/fact_and_figures/0304/default.aspx
drugs2	NHS National Treatment Agency for Substance Misuse - www.nta.nhs.uk/areas/fact_and_figures/0304/default.aspx
drugs3	NHS National Treatment Agency for Substance Misuse - www.nta.nhs.uk/areas/fact_and_figures/0304/default.aspx
drugs4	NHS National Treatment Agency for Substance Misuse - www.nta.nhs.uk/areas/fact_and_figures/0304/default.aspx
drugs5	NHS National Treatment Agency for Substance Misuse - www.nta.nhs.uk/areas/fact_and_figures/0304/default.aspx
drugs6	NHS National Treatment Agency for Substance Misuse - www.nta.nhs.uk/areas/fact_and_figures/0304/default.aspx
poorhealth2	Census Area Statistics
poorhealth3	Census Area Statistics

Appendix 3 - PCT and Local Authority Areas

Name of Primary Care Organisation	Local Authorities included
Newcastle	Newcastle-upon-tyne
North Tyneside	North Tyneside
Hartlepool	Hartlepool
Darlington	Darlington
Durham and Chester-le-Street	Durham + Chester-le-Street
Easington	Easington
South Tyneside	South Tyneside
Sunderland Teaching	Sunderland
Middlesbrough	Middlesbrough
Blackburn with Darwen	Blackburn with Darwen
Manchester (Central + North + South)	Manchester
Trafford (North + South)	Trafford
Carlisle and District	Carlisle
Eden Valley	Eden
Chorley and South Ribble	Chorley + South Ribble
West Lancashire	West Lancashire
Salford	Salford
Stockport	Stockport
Hyndburn and Ribble Valley	Hyndburn + Ribble Valley
Burnley, Pendle and Rossendale	Burnley, Pendle + Rossendale
Liverpool (North + South + Central)	Liverpool
Ellesmere Port and Neston	Ellesmere Port and Neston
Preston	Preston
Fylde	Fylde
Wyre	Wyre
Blackpool	Blackpool
Bolton	Bolton
Halton	Halton
Warrington	Warrington
St Helens	St Helens
Knowsley	Knowsley
Oldham	Oldham
Bury	Bury
Rochdale	Rochdale
Tameside and Glossop	Tameside
North East Lincolnshire	North East Lincolnshire
Bradford (City + South and West + North)	Bradford
Doncaster (Central + East + West)	Doncaster
Selby and York	Selby + York
Eastern Hull + West Hull	Kingston upon Hull
Eastern wakefield + Wakefield West	Wakefield
North Lincolnshire	North Lincolnshire
Sheffield (West + South West+ North + South East)	Sheffield
Rotherham	Rotherham
Leeds (West + North East + East + South + North West)	Leeds
Calderdale	Calderdale
Daventry and South Northamptonshire	Daventry and South Northamptonshire
Central Derby + Greater Derby	Derby
Mansfield District	Mansfield
Newark and Sherwood	Newark and Sherwood
Chesterfield	Chesterfield
Gedling	Gedling
Amber Valley	Amber Valley
Melton, Rutland and Harborough	Melton + Rutland + Harborough
Leicester City West + Eastern Leicester	Leicester

Appendix 3 - PCT and Local Authority Areas

Nottingham City	Nottingham
Erewash	Erewash
Bassetlaw	Bassetlaw
Broxtowe & Hucknall	Broxtowe
Ashfield	Ashfield
Rushcliffe	Rushcliffe
Derbyshire Dales and South Derbyshire	Derbyshire Dales and South Derbyshire
High Peak and Dales	High Peak
Hinckley and Bosworth	Hinckley and Bosworth
Charnwood and North West Leicestershire	Charnwood and North West Leicestershire
Northampton	Northampton
Herefordshire	Herefordshire
Solihull	Solihull
Wyre Forest	Wyre Forest
Staffordshire moorlands	Staffordshire moorlands
Dudley (South + Beacon Castle)	Dudley
Newcastle under lyme	Newcastle under Lyme
Shropshire County	Bridgnorth +North Shropshire +Oswestry + Shrewsbury and Atcham + South Shropshire
Walsall	Walsall
Rugby	Rugby
Coventry	Coventry
North Stoke + South Stoke	Stoke on Trent
Telford and Wrekin	Telford and Wrekin
East Staffordshire	East Staffordshire
Cannock Chase	Cannock Chase
Redditch and Bromsgrove	Redditch + Bromsgrove
Wolverhampton City	Wolverhampton
Birmingham (South + North + Heart of Birmingham Teaching + Eastern)	Birmingham
Norwich	Norwich
Peterborough (North + South)	Peterborough
Tendring	Tendering
Epping Forest	Epping Forest
Southend on Sea	Southend on Sea
Harlow	Harlow
Southern Norfolk	Southern Norfolk
Luton	Luton
Bedford	Bedford
Huntingdonshire	Huntingdonshire
Welwyn Hatfield	Welwyn Hatfield
North Hertfordshire and Stevenage	North Hertfordshire + Stevenage
Colchester	Colchester
Uttlesford	Uttlesford
Thurrock	Thurrock
Basildon	Basildon
Great Yarmouth	Great Yarmouth
Watford and Three Rivers	Watford + Three Rivers
Dacorum	Dacorum
Cambridge City	Cambridge
South Cambridgeshire	South Cambridgeshire
East Cambridgeshire and Fenland	East Cambridgeshire + Fenland
Broadland	Broadland
North Norfolk	North Norfolk
Castle Point and Rochford	Castle Point + Rochford
Ipswich	Ipswich
Suffolk Coastal	Suffolk Coastal
Waveney	Waveney

Appendix 3 - PCT and Local Authority Areas

Havering	Havering
Kingston	Kingston upon Thames
Bromley	Bromley
Greenwich	Greenwich
Barnet	Barnet
Hillingdon	Hillingdon
Bexley	Bexley
Enfield	Enfield
Barking and Dagenham	Barking and Dagenham
City and Hackney	Hackney
Tower Hamlets	Tower Hamlets
Newham	Newham
Redbridge	Redbridge
Haringey	Haringey
Hammersmith and Fulham	Hammersmith and Fulham
Ealing	Ealing
Hounslow	Hounslow
Brent	Brent
Harrow	Harrow
Camden	Camden
Islington	Islington
Croydon	Croydon
Kensington and Chelsea	Kensington and Chelsea
Westminster	Westminster
Lambeth	Lambeth
Southwark	Southwark
Lewisham	Lewisham
Wandsworth	Wandsworth
Richmond and Twickenham	Richmond upon Thames
Sutton and Merton	Sutton + Merton
New Forest	New Forest
Dartford, Gravesham and Swanley	Dartford + Gravesham
Milton Keynes	Milton Keynes
Isle of Wight	Isle of Wight
Reading	Reading
Slough	Slough
Wokingham	Wokingham
Vale of Aylesbury	Aylesbury Vale
Cherwell Vale	Cherwell
East Hampshire	East Hampshire
Portsmouth City	Portsmouth
Mid Sussex	Mid Sussex
Bracknell Forest	Bracknell Forest
Windsor, Ascot and Maidenhead	Windsor and Maidenhead
Chiltern and South Bucks	Chiltern + South Bucks
Wycombe	Wycombe
Southampton City	Southampton
Maidstone Weald	Maidstone
Medway	Medway
Swale	Swale
Guildford and Waverley	Guildford + Waverley
Woking Area	Woking
Adur, Arun and Worthing	Adur + Arun + Worthing
Ashford	Ashford
Shepway	Shepway
Brighton and Hove City	Brighton and Hove
Eastbourne Downs	Eastbourne
Fareham and Gosport	Fareham + Gosport

Appendix 3 - PCT and Local Authority Areas

Eastleigh and Test Valley South	Eastleigh + Test Valley
Crawley	Crawley
South Gloucestershire	South Gloucestershire
North Dorset	North Dorset
Bournemouth	Bournemouth
South Hams and West Devon	South Hams + West Devon
Torbay	Torbay
West Wiltshire	West Wiltshire
Plymouth	Plymouth
Bath and North East Somerset	Bath and North East Somerset
West of Cornwall	Penwith + Kerrier + Isles of Scilly
South and East Dorset	Purbeck + East Dorset + Christchurch
South West Dorset	West Dorset + Weymouth and Portland
North Devon	North Devon + Torridge
Exeter	Exeter
East Devon	East Devon
Mid Devon	Mid Devon
Somerset Coast	Sedgemoor + West Somerset
Mendip	Mendip
Teignbridge	Teignbridge
Bristol (North + South and West)	Bristol
South Somerset	South Somerset
Taunton Deane	Taunton Deane
Swindon	Swindon
Kennet and North Wiltshire	Kennet and North Wiltshire
North and East Cornwall	Carradon and North Cornwall
Central Cornwall	Carrick + Restormel
Poole	Poole
Cheltenham and Tewkesbury	Cheltenham + Tewkesbury
North Somerset	North Somerset

Appendix 4 - Factor Scores for each Local Authority

Local Authority area	Factor Scores
Chesterfield Borough Council	-0.036520055
Oadby and Wigston Borough Council	-1.258801864
Boston Borough Council	-1.144945166
Corby Borough Council	-0.778604414
Kettering Borough Council	-0.559635562
Wellingborough Borough Council	-0.352017155
Brentwood Borough Council	-1.238337152
Castle Point Borough Council	-0.702193774
Broxbourne Borough Council	-0.55914914
Hertsmere Borough Council	-0.474086182
Stevenage Borough Council	-0.405342388
Watford Borough Council	-0.512794548
Great Yarmouth Borough Council	-0.027280553
Blyth Valley Borough Council	-0.320282599
Sedgefield Borough Council	-0.263430878
Congleton Borough Council	-0.893101972
Ellesmere Port and Neston Borough Council	-0.745244003
Barrow in Furness Borough Council	-0.588838175
Burnley Borough Council	-0.053742872
Fylde Borough Council	-0.974677546
Hyndburn Borough Council	-0.310263887
Pendle Borough Council	-0.127379549
Rossendale Borough Council	-0.758606555
Eastbourne Borough Council	-0.176083297
Hastings Borough Council	0.100834628
Gosport Borough Council	-0.574025524
Rushmoor Borough Council	-0.580074446
Dartford Borough Council	-0.406636512
Runnymede Borough Council	-0.939441305
Spelthorne Borough Council	-0.660951891
Epsom and Ewell Borough Council	-1.135062308
Surrey Heath Borough Council	-1.230545063
Crawley Borough Council	-0.222871427
Worthing Borough Council	-0.246200691
Gravesham Borough Council	-0.528797583
Woking Borough Council	-0.848226849
Christchurch Borough Council	-1.744890281
Weymouth and Portland Borough Council	-0.820258291
Oswestry Borough Council	-1.940237836
Tamworth Borough Council	-0.595489449
North Warwickshire Borough Council	-1.003101558
Rugby Borough Council	-0.395223975
Redditich Borough Council	-0.371017566
Amber Valley Borough Council	-0.095150545
Erewash Borough Council	-0.067801927
Charnwood Borough Council	0.259262961
Hinckley and Bosworth Borough Council	-0.410757662
Northampton Borough Council	1.057098095
Broxtowe Borough Council	-0.20955838
Gedling Borough Council	0.019702954
Rushcliffe Borough Council	-0.539629362
Colchester Borough Council	0.340884772
Chelmsford Borough Council	0.112843684
Dacorum Borough Council	0.009036462
Ipswich Borough Council	0.411280992
Vale Royal Borough Council	-0.099082962
Chorley Borough Council	-0.334426253

Appendix 4 - Factor Scores for each Local Authority

South Ribble Borough Council	-0.426226008
Wyre Borough Council	-0.250536241
Eastleigh Borough Council	-0.411724689
Fareham Borough Council	-0.576789621
Havant Borough Council	0.067497324
Maidstone Borough Council	0.038704845
Swale Borough Council	0.215995709
Tonbridge and Malling Borough Council	-0.499017781
Tunbridge Wells Borough Council	-0.465111736
Guildford Borough Council	-0.375217013
Reigate and Banstead Borough Council	-0.354233163
Waverley Borough Council	-0.612545731
Elmbridge Borough Council	-0.328815367
Cheltenham Borough Council	-0.120550901
East Staffordshire Borough Council	-0.062968546
Newcastle under Lyme Borough Council	0.002914938
Nuneaton and Bedworth Borough Council	0.054754177
High Peak Borough Council	-0.462151746
Melton Borough Council	-1.701654271
St Edmundsbury Borough Council	-0.50997817
Castle Morpeth Borough Council	-1.386965599
Copeland Borough Council	-0.784963107
Ribble Valley Borough Council	-1.687503136
Restormel Borough Council	-0.364693061
Tewkesbury Borough Council	-0.926909686
Shrewsbury and Atcham Borough Council	-0.48384484
Bedford Borough Council	0.521041069
Crewe and Nantwich Borough Council	-0.08212611
Macclesfield Borough Council	-0.007460041
Basingstoke and Deane Borough Council	0.031708994
Test Valley Borough Council	-0.531235348
Ashford Borough Council	-0.211022371
Taunton Deane Borough Council	-0.277227375
Stafford Borough Council	-0.07445261
Berwick upon Tweed Borough Council	-2.387676401
West Devon Borough Council	-1.658648583
Scarborough Borough Council	-0.007386295
Allerdale Borough Council	-0.492696468
King's Lynn and West Norfolk Borough Council	0.092419412
Harrogate Borough Council	-0.021322049
Bolsover District Council	-0.629862298
North East Derbyshire District Council	-0.32329527
South Derbyshire District Council	-0.740779831
Blaby District Council	-0.723070677
North West Leicestershire District Council	-0.645983813
Mansfield District Council	0.080289714
Harlow District Council	-0.387553229
Maldon District Council	-1.386303953
Rochford District Council	-0.909705633
Three Rivers District Council	-0.757963557
Welwyn Hatfield District Council	-0.478609776
Forest Heath District Council	-1.164274065
Derwentside District Council	-0.367447962
Easington District Council	-0.087664701
Chester-le-Street District Council	-1.17801713
Wansbeck District Council	-0.653388925
Chiltern District Council	-1.012309005
South Bucks	-1.494376775

Appendix 4 - Factor Scores for each Local Authority

Lewes District Council	-0.397874369
Hart District Council	-1.279460159
Shepway District Council	-0.052114011
Mole Valley District Council	-1.169260631
Tandridge District Council	-1.066643606
Adur District Council	-1.058250775
Penwith District Council	-0.737539465
East Dorset District Council	-1.040723349
Purbeck District Council	-1.86056927
Isles of Scilly Council	.
Cannock Chase District Council	-0.338549463
Litchfield District Council	-0.584225455
Bromsgrove District Council	-0.747768774
Wyre Forest District Council	-0.38746914
Ashfield District Council	0.077874803
South Bedfordshire District Council	-0.155325167
Basildon District Council	0.630964561
Epping Forest District Council	-0.186928895
Tendring District Council	0.280826944
St Albans District Council	-0.324318883
North Hertfordshire District Council	-0.15812302
Waveney District Council	0.04840012
West Lancashire District Council	-0.077977587
Wycombe District Council	0.274140005
Dover District Council	-0.054211731
Sevenoaks District Council	-0.473601412
Thanet District Council	0.584414611
Mid Sussex District Council	-0.455838837
Arun District Council	0.056301561
South Staffordshire District Council	-0.476273118
Warwick District Council	-0.060960137
Derbyshire Dales District Council	-1.189834026
Harborough District Council	-1.112869714
South Holland District Council	-0.929234223
Daventry District Council	-1.124249207
East Northamptonshire District Council	-0.747575691
South Northamptonshire District Council	-1.214730304
East Cambridgeshire District Council	-1.000360472
Fenland District Council	-0.456060171
Uttlesford District Council	-1.434992531
Babergh	-0.825106036
Wear Valley District Council	-0.664348354
Rother District Council	-0.602653225
West Oxfordshire District Council	-0.913595447
Caradon District Council	-0.658740285
Carrick District Council	-0.498594463
Kerrier District Council	-0.326378198
North Dorset District Council	-1.449881733
Forest of Dean District Council	-0.781593469
West Somerset District Council	-1.877388601
Bridgnorth District Council	-1.682950028
North Shropshire District Council	-1.341667187
Staffordshire Moorlands District Council	-0.655935117
Malvern Hills District Council	-1.089198703
Selby District Council	-0.950853077
Bassetlaw District Council	-0.044931604
Newark and Sherwood District Council	-0.198817003
Mid Bedfordshire District Council	-0.3981395

Appendix 4 - Factor Scores for each Local Authority

Braintree District Council	-0.081308872
East Hertfordshire District Council	-0.464558702
Broadland District Council	-0.515013603
East Hampshire District Council	-0.587682046
New Forest District Council	0.144631204
Cherwell District Council	-0.190572912
South Oxfordshire District Council	-0.516931068
Vale of White Horse District Council	-0.606401778
Chichester District Council	-0.531992099
Horsham District Council	-0.49435015
Teignbridge District Council	-0.180992574
Stroud District Council	-0.434030571
Mendip District Council	-0.37143477
Sedgemoor District Council	-0.215488403
North Wiltshire District Council	-0.367044549
West Wiltshire District Council	-0.271400088
Wychavon District Council	-0.499533314
North Kesteven District Council	-0.696563814
West Lindsey District Council	-0.758971373
North Norfolk District Council	-0.457977308
Mid Suffolk District Council	-0.963605906
Teesdale District Council	-2.463883988
North Cornwall District Council	-0.671234363
Mid Devon District Council	-1.04020257
North Devon District Council	-0.624032378
South Hams District Council	-0.901388254
Torridge District Council	-1.210480315
West Dorset District Council	-0.766469415
Cotswold District Council	-1.129276289
Kennet District Council	-1.045848066
South Shropshire District Council	-1.989370239
Craven District Council	-1.617642296
South Kesteven District Council	-0.10584333
Huntingdonshire District Council	0.170351079
South Cambridgeshire District Council	-0.450793553
South Norfolk District Council	-0.589607432
Suffolk Coastal District Council	-0.291054881
Aylesbury Vale District Council	0.171857217
Wealden District Council	-0.241161435
East Devon District Council	-0.339718847
South Somerset District Council	0.016199862
Salisbury District Council	-0.406103771
Stratford on Avon District Council	-0.528311914
Alnwick District Council	-0.888102468
Hambleton District Council	-0.881830354
Richmondshire District Council	-1.695990938
Ryedale District Council	-1.683230486
Breckland District Council	-0.138265232
South Lakeland District Council	-0.735312446
Tynedale District Council	-1.380208697
Eden District Council	-1.890765379
East Lindsey District Council	0.054529003
Rutland Unitary Council	-2.195567953
Darlington Borough Council	0.061565865
Hartlepool Borough Council	-0.001686053
North East Lincolnshire Unitary Council	0.676154205
Luton Borough Council	1.026127318
Southend-on-Sea Borough Council	0.772617769

Appendix 4 - Factor Scores for each Local Authority

Thurrock Unitary Council	0.43314574
Peterborough City Council	0.762053133
Middlesbrough Borough Council	0.830128268
Redcar and Cleveland Borough Council	0.502488224
Stockton on Tees Borough Council	0.851344384
Warrington Borough Council	0.676803352
Blackburn with Darwen Borough Council	0.652877082
Blackpool Borough Council	0.673335445
Halton Borough Council	0.313874344
Bracknell Forest Borough Council	-0.394627512
Reading Borough Council	0.467882514
Slough Borough Council	0.290666969
Windsor and Maidenhead Royal Borough Council	-0.1539239
Wokingham District Council	-0.272622018
Isle of Wight Unitary Council	0.269395435
Portsmouth City Council	0.892980726
Torbay Borough Council	0.32673228
Bournemouth Borough Council	0.664564446
Poole Borough Council	0.066655186
Bath and North East Somerset District Council	0.213520013
North Somerset District Council	0.313174729
Swindon Borough Council	0.654969059
Telford and Wrekin Borough Council	0.659154797
York Unitary Council	0.419489076
Derby City Council	1.395376996
Leicester City Council	1.838361545
Nottingham City Council	1.943323518
Southampton City Council	1.167846195
Medway Council	1.267585527
Milton Keynes Borough Council	1.001190809
Brighton and Hove City Council	1.49300768
Plymouth Unitary City Council	1.313452359
Stoke-on-Trent City Council	1.454064387
Kingston Upon Hull Unitary City Council	1.603692295
Bristol City Council	2.040880185
West Berkshire District Council	-0.135010472
South Gloucestershire Council	0.633710163
North Lincolnshire Unitary Council	0.40380163
Herefordshire	0.312170277
East Riding of Yorkshire Unitary Council	1.225728056
Lincoln City Council	-0.144789304
Durham City Council	-0.444109917
Worcester City Council	-0.365920723
Cambridge City Council	-0.197064658
Norwich City Council	0.451333806
Preston City Council	0.463200721
Canterbury City Council	0.27313503
Oxford City Council	0.257592838
Exeter City Council	-0.022763841
Gloucester City Council	0.253973769
Newcastle-upon-Tyne City Council	1.628412602
Sunderland City Council	1.555827604
Salford City Council	1.311094315
Wolverhampton City Council	1.662564202
Manchester City Council	2.622843146
Coventry City Council	1.755694226
Liverpool City Council	2.671841266
Birmingham City Council	3.773910339

Appendix 4 - Factor Scores for each Local Authority

Chester City Council	-0.234776928
Lancaster City Council	0.355946269
Winchester City Council	-0.741953956
Carlisle City Council	-0.223355248
Hammersmith and Fulham London Borough Council	1.031750007
Islington London Borough Council	1.432766681
Kensington and Chelsea Royal Borough Council	0.733246118
Camden London Borough Council	1.259166035
Tower Hamlets London Borough Council	1.434241045
Westminster London Borough Council	1.109928319
Haringey London Borough Council	1.718296791
Lewisham London Borough Council	1.883046205
Hackney London Borough Council	1.807774786
Lambeth London Borough Council	2.052326318
Newham London Borough Council	1.890689298
Southwark London Borough Council	1.964071456
Wandsworth London Borough Council	1.491333665
Barking and Dagenham London Borough Council	1.022152292
London Borough of Merton Council	0.825458076
Richmond upon Thames London Borough Council	0.256411278
Royal Borough Council of Kingston upon Thames	0.178621173
Sutton London Borough Council	0.607722295
Bexley London Borough Council	0.939111528
Brent London Borough Council	1.736305255
Bromley London Borough Council	1.324413397
Enfield London Borough Council	1.601441943
Greenwich London Borough Council	1.605766795
Harrow London Borough Council	0.818230064
Havering London Borough Council	0.880525619
Hounslow London Borough Council	1.115550177
London Borough of Hillingdon Council	1.15549031
Redbridge London Borough Council	1.149370619
Waltham Forest London Borough Council	1.507965605
Barnet London Borough Council	1.508251283
Croydon London Borough Council	2.002090412
Ealing London Borough Council	1.680490878
Gateshead Metropolitan Borough Council	0.961802656
North Tyneside Metropolitan Borough Council	0.994124054
South Tyneside Metropolitan Borough Council	0.884466832
Bury Metropolitan Borough Council	0.760223711
Knowsley Metropolitan Borough Council	0.966850036
St Helens Metropolitan Borough Council	0.77128159
Solihull Metropolitan Borough Council	0.756002032
Calderdale Metropolitan Borough Council	0.937466772
Bolton Metropolitan Borough Council	1.441655071
Oldham Metropolitan Borough Council	1.311634858
Rochdale Metropolitan Borough Council	1.230729194
Stockport Metropolitan Borough Council	1.299732201
Tameside Metropolitan Borough Council	1.118600598
Trafford Metropolitan Borough Council	0.953127969
Sefton Metropolitan Borough Council	1.40649706
Sandwell Metropolitan Borough Council	1.944539864
Walsall Metropolitan Borough Council	1.5339841
Barnsley Metropolitan Borough Council	1.014568271
Rotherham Metropolitan Borough Council	1.230760923
Wigan Metropolitan Borough Council	1.447493469
Wirral Metropolitan Borough Council	1.702725347
Dudley Metropolitan Borough Council	1.585179881

Appendix 4 - Factor Scores for each Local Authority

Kirklees Metropolitan Borough Council	1.958672436
Wakefield Metropolitan Borough Council	1.560311532
Bradford Metropolitan Borough Council	2.452707235
Sheffield Metropolitan Borough Council	2.495166442
Doncaster Metropolitan Borough Council	1.635069293
Leeds Metropolitan Borough Council	2.89051797

APPENDIX 5A – EXTRACT FROM THE HOUSING ACT 1996

PART VII HOMELESSNESS

Homelessness and threatened homelessness

175 Homelessness and threatened homelessness

(1) A person is homeless if he has no accommodation available for his occupation, in the United Kingdom or elsewhere, which he—

(a) is entitled to occupy by virtue of an interest in it or by virtue of an order of a court,

(b) has an express or implied licence to occupy, or

(c) occupies as a residence by virtue of any enactment or rule of law giving him the right to remain in occupation or restricting the right of another person to recover possession.

(2) A person is also homeless if he has accommodation but—

(a) he cannot secure entry to it, or

(b) it consists of a moveable structure, vehicle or vessel designed or adapted for human habitation and there is no place where he is entitled or permitted both to place it and to reside in it.

(3) A person shall not be treated as having accommodation unless it is accommodation which it would be reasonable for him to continue to occupy.

(4) A person is threatened with homelessness if it is likely that he will become homeless within 28 days.

176 Meaning of accommodation available for occupation

Accommodation shall be regarded as available for a person's occupation only if it is available for occupation by him together with—

(a) any other person who normally resides with him as a member of his family, or

(b) any other person who might reasonably be expected to reside with him.

References in this Part to securing that accommodation is available for a person's occupation shall be construed accordingly.

177 Whether it is reasonable to continue to occupy accommodation

(1) It is not reasonable for a person to continue to occupy accommodation if it is probable that this will lead to domestic violence against him, or against—

(a) a person who normally resides with him as a member of his family, or

(b) any other person who might reasonably be expected to reside with him.

For this purpose "domestic violence", in relation to a person, means violence from a person with whom he is associated, or threats of violence from such a person which are likely to be carried out.

(2) In determining whether it would be, or would have been, reasonable for a person to continue to occupy accommodation, regard may be had to the general circumstances prevailing in relation to housing in the district of the local housing authority to whom he has applied for accommodation or for assistance in obtaining accommodation.

(3) The Secretary of State may by order specify—

(a) other circumstances in which it is to be regarded as reasonable or not reasonable for a person to continue to occupy accommodation, and

(b) other matters to be taken into account or disregarded in determining whether it would be, or would have been, reasonable for a person to continue to occupy accommodation.

178 Meaning of associated person

(1) For the purposes of this Part, a person is associated with another person if—

(a) they are or have been married to each other;

(b) they are cohabitants or former cohabitants;

(c) they live or have lived in the same household;

(d) they are relatives;

(e) they have agreed to marry one another (whether or not that agreement has been terminated);

(f) in relation to a child, each of them is a parent of the child or has, or has had, parental responsibility for the child.

(2) If a child has been adopted or has been freed for adoption by virtue of any of the enactments mentioned in section 16(1) of the [1976 c. 36.] Adoption Act 1976, two persons are also associated with each other for the purposes of this Part if—

(a) one is a natural parent of the child or a parent of such a natural parent, and

(b) the other is the child or a person—

(i) who has become a parent of the child by virtue of an adoption order or who has applied for an adoption order, or

(ii) with whom the child has at any time been placed for adoption.

(3) In this section—

- "adoption order" has the meaning given by section 72(1) of the Adoption Act 1976;
- "child" means a person under the age of 18 years;
- "cohabitants" means a man and a woman who, although not married to each other, are living together as husband and wife, and "former cohabitants" shall be construed accordingly;
- "parental responsibility" has the same meaning as in the [1989 c. 41.] Children Act 1989; and
- "relative", in relation to a person, means—

  (a)
  the father, mother, stepfather, stepmother, son, daughter, stepson, stepdaughter, grandmother, grandfather, grandson or granddaughter of that person or of that person's spouse or former spouse, or

  (b)
  the brother, sister, uncle, aunt, niece or nephew (whether of the full blood or of the half blood or by affinity) of that person or of that person's spouse or former spouse,

  and includes, in relation to a person who is living or has lived with another person as husband and wife, a person who would fall within paragraph (a) or (b) if the parties were married to each other.

General functions in relation to homelessness or threatened homelessness

179 Duty of local housing authority to provide advisory services

(1) Every local housing authority shall secure that advice and information about homelessness, and the prevention of homelessness, is available free of charge to any person in their district.

(2) The authority may give to any person by whom such advice and information is provided on behalf of the authority assistance by way of grant or loan.

(3) A local housing authority may also assist any such person—

(a) by permitting him to use premises belonging to the authority,

(b) by making available furniture or other goods, whether by way of gift, loan or otherwise, and

(c) by making available the services of staff employed by the authority.

APPENDIX 5A – EXTRACT FROM THE HOUSING ACT 1996

180 Assistance for voluntary organisations

(1) The Secretary of State or a local housing authority may give assistance by way of grant or loan to voluntary organisations concerned with homelessness or matters relating to homelessness.

(2) A local housing authority may also assist any such organisation—

(a) by permitting them to use premises belonging to the authority,

(b) by making available furniture or other goods, whether by way of gift, loan or otherwise, and

(c) by making available the services of staff employed by the authority.

(3) A "voluntary organisation" means a body (other than a public or local authority) whose activities are not carried on for profit.

181 Terms and conditions of assistance

(1) This section has effect as to the terms and conditions on which assistance is given under section 179 or 180.

(2) Assistance shall be on such terms, and subject to such conditions, as the person giving the assistance may determine.

(3) No assistance shall be given unless the person to whom it is given undertakes—

(a) to use the money, furniture or other goods or premises for a specified purpose, and

(b) to provide such information as may reasonably be required as to the manner in which the assistance is being used.

The person giving the assistance may require such information by notice in writing, which shall be complied with within 21 days beginning with the date on which the notice is served.

(4) The conditions subject to which assistance is given shall in all cases include conditions requiring the person to whom the assistance is given—

(a) to keep proper books of account and have them audited in such manner as may be specified,

(b) to keep records indicating how he has used the money, furniture or other goods or premises, and

(c) to submit the books of account and records for inspection by the person giving the assistance.

(5) If it appears to the person giving the assistance that the person to whom it was given has failed to carry out his undertaking as to the purpose for which the assistance was to be used, he shall take all reasonable steps to recover from that person an amount equal to the amount of the assistance.

(6) He must first serve on the person to whom the assistance was given a notice specifying the amount which in his opinion is recoverable and the basis on which that amount has been calculated.

182 Guidance by the Secretary of State

(1) In the exercise of their functions relating to homelessness and the prevention of homelessness, a local housing authority or social services authority shall have regard to such guidance as may from time to time be given by the Secretary of State.

(2) The Secretary of State may give guidance either generally or to specified descriptions of authorities.

Application for assistance in case of homelessness or threatened homelessness

183 Application for assistance

(1) The following provisions of this Part apply where a person applies to a local housing authority for accommodation, or for assistance in obtaining accommodation, and the authority have reason to believe that he is or may be homeless or threatened with homelessness.

(2) In this Part—

- "applicant" means a person making such an application,
- "assistance under this Part" means the benefit of any function under the following provisions of this Part relating to accommodation or assistance in obtaining accommodation, and
- "eligible for assistance" means not excluded from such assistance by section 185 (persons from abroad not eligible for housing assistance) or section 186 (asylum seekers and their dependants).

(3) Nothing in this section or the following provisions of this Part affects a person's entitlement to advice and information under section 179 (duty to provide advisory services).

184 Inquiry into cases of homelessness or threatened homelessness

(1) If the local housing authority have reason to believe that an applicant may be homeless or threatened with homelessness, they shall make such inquiries as are necessary to satisfy themselves—

(a) whether he is eligible for assistance, and

(b) if so, whether any duty, and if so what duty, is owed to him under the following provisions of this Part.

(2) They may also make inquiries whether he has a local connection with the district of another local housing authority in England, Wales or Scotland.

(3) On completing their inquiries the authority shall notify the applicant of their decision and, so far as any issue is decided against his interests, inform him of the reasons for their decision.

(4) If the authority have notified or intend to notify another local housing authority under section 198 (referral of cases), they shall at the same time notify the applicant of that decision and inform him of the reasons for it.

(5) A notice under subsection (3) or (4) shall also inform the applicant of his right to request a review of the decision and of the time within which such a request must be made (see section 202).

(6) Notice required to be given to a person under this section shall be given in writing and, if not received by him, shall be treated as having been given to him if it is made available at the authority's office for a reasonable period for collection by him or on his behalf.

Eligibility for assistance

185 Persons from abroad not eligible for housing assistance

(1) A person is not eligible for assistance under this Part if he is a person from abroad who is ineligible for housing assistance.

(2) A person who is subject to immigration control within the meaning of the [1996 c. 49.] Asylum and Immigration Act 1996 is not eligible for housing assistance unless he is of a class prescribed by regulations made by the Secretary of State.

(3) The Secretary of State may make provision by regulations as to other descriptions of persons who are to be treated for the purposes of this Part as persons from abroad who are ineligible for housing assistance.

(4) A person from abroad who is not eligible for housing assistance shall be disregarded in determining for the purposes of this Part whether another person—

(a) is homeless or threatened with homelessness, or

(b) has a priority need for accommodation.

186 Asylum-seekers and their dependants

(1) An asylum-seeker, or a dependant of an asylum-seeker who is not by virtue of section 185 a person from abroad who is ineligible for housing assistance, is not eligible for assistance under this Part if he has any accommodation in the United Kingdom, however temporary, available for his occupation.

(2) For the purposes of this section a person who makes a claim for asylum—

(a) becomes an asylum-seeker at the time when his claim is recorded by the Secretary of State as having been made, and

(b) ceases to be an asylum-seeker at the time when his claim is recorded by the Secretary of State as having been finally determined or abandoned.

(3) For the purposes of this section a person—

(a) becomes a dependant of an asylum-seeker at the time when he is recorded by the Secretary of State as being a dependant of the asylum-seeker, and

(b) ceases to be a dependant of an asylum-seeker at the time when the person whose dependant he is ceases to be an asylum-seeker or, if it is earlier, at the time when he is recorded by the Secretary of State as ceasing to be a dependant of the asylum-seeker.

(4) In relation to an asylum-seeker, "dependant" means a person—

(a) who is his spouse or a child of his under the age of eighteen, and

(b) who has neither a right of abode in the United Kingdom nor indefinite leave under the [1971 c. 77.] Immigration Act 1971 to enter or remain in the United Kingdom.

(5) In this section a "claim for asylum" means a claim made by a person that it would be contrary to the United Kingdom's obligations under the Convention relating to the Status of Refugees done at Geneva on 28th July 1951 and the Protocol to that Convention for him to be removed from, or required to leave, the United Kingdom.

187 Provision of information by Secretary of State

(1) The Secretary of State shall, at the request of a local housing authority, provide the authority with such information as they may require—

(a) as to whether a person is or has become an asylum-seeker, or a dependant of an asylum-seeker, and

(b) to enable them to determine whether such a person is eligible for assistance under this Part under section 185 (persons from abroad not eligible for housing assistance).

(2) Where that information is given otherwise than in writing, the Secretary of State shall confirm it in writing if a written request is made to him by the authority.

(3) If it appears to the Secretary of State that any application, decision or other change of circumstances has affected the status of a person about whom information was previously provided by him to a local housing authority under this section, he shall inform the authority in writing of that fact, the reason for it and the date on which the previous information became inaccurate.

Interim duty to accommodate

188 Interim duty to accommodate in case of apparent priority need

(1) If the local housing authority have reason to believe that an applicant may be homeless, eligible for assistance and have a priority need, they shall secure that accommodation is available for his occupation pending a decision as to the duty (if any) owed to him under the following provisions of this Part.

(2) The duty under this section arises irrespective of any possibility of the referral of the applicant's case to another local housing authority (see sections 198 to 200).

(3) The duty ceases when the authority's decision is notified to the applicant, even if the applicant requests a review of the decision (see section 202).

The authority may continue to secure that accommodation is available for the applicant's occupation pending a decision on a review.

189 Priority need for accommodation

(1) The following have a priority need for accommodation—

(a) a pregnant woman or a person with whom she resides or might reasonably be expected to reside;

(b) a person with whom dependent children reside or might reasonably be expected to reside;

(c) a person who is vulnerable as a result of old age, mental illness or handicap or physical disability or other special reason, or with whom such a person resides or might reasonably be expected to reside;

(d) a person who is homeless or threatened with homelessness as a result of an emergency such as flood, fire or other disaster.

(2) The Secretary of State may by order—

(a) specify further descriptions of persons as having a priority need for accommodation, and

(b) amend or repeal any part of subsection (1).

(3) Before making such an order the Secretary of State shall consult such associations representing relevant authorities, and such other persons, as he considers appropriate.

(4) No such order shall be made unless a draft of it has been approved by resolution of each House of Parliament.

Duties to persons found to be homeless or threatened with homelessness

190 Duties to persons becoming homeless intentionally

(1) This section applies where the local housing authority are satisfied that an applicant is homeless and is eligible for assistance but are also satisfied that he became homeless intentionally.

(2) If the authority are satisfied that the applicant has a priority need, they shall—

(a) secure that accommodation is available for his occupation for such period as they consider will give him a reasonable opportunity of securing accommodation for his occupation, and

(b) provide him with advice and such assistance as they consider appropriate in the circumstances in any attempts he may make to secure that accommodation becomes available for his occupation.

(3) If they are not satisfied that he has a priority need, they shall provide him with advice and such assistance as they consider appropriate in the circumstances in any attempts he may make to secure that accommodation becomes available for his occupation.

191 Becoming homeless intentionally

(1) A person becomes homeless intentionally if he deliberately does or fails to do anything in consequence of which he ceases to occupy accommodation which is available for his occupation and which it would have been reasonable for him to continue to occupy.

(2) For the purposes of subsection (1) an act or omission in good faith on the part of a person who was unaware of any relevant fact shall not be treated as deliberate.

(3) A person shall be treated as becoming homeless intentionally if—

(a) he enters into an arrangement under which he is required to cease to occupy accommodation which it would have been reasonable for him to continue to occupy, and

(b) the purpose of the arrangement is to enable him to become entitled to assistance under this Part,

and there is no other good reason why he is homeless.

(4) A person who is given advice or assistance under section 197 (duty where other suitable alternative accommodation available), but fails to secure suitable accommodation in circumstances in which it was reasonably to be expected that he would do so, shall, if he makes a further application under this Part, be treated as having become homeless intentionally.

192 Duty to persons not in priority need who are not homeless intentionally

(1) This section applies where the local housing authority—

(a) are satisfied that an applicant is homeless and eligible for assistance, and

(b) are not satisfied that he became homeless intentionally,

but are not satisfied that he has a priority need.

(2) The authority shall provide the applicant with advice and such assistance as they consider appropriate in the circumstances in any attempts he may make to secure that accommodation becomes available for his occupation.

193 Duty to persons with priority need who are not homeless intentionally

(1) This section applies where the local housing authority are satisfied that an applicant is homeless, eligible for assistance and has a priority need, and are not satisfied that he became homeless intentionally.

This section has effect subject to section 197 (duty where other suitable accommodation available).

(2) Unless the authority refer the application to another local housing authority (see section 198), they shall secure that accommodation is available for occupation by the applicant.

(3) The authority are subject to the duty under this section for a period of two years ("the minimum period"), subject to the following provisions of this section.

After the end of that period the authority may continue to secure that accommodation is available for occupation by the applicant, but are not obliged to do so (see section 194).

(4) The minimum period begins with—

(a) if the applicant was occupying accommodation made available under section 188 (interim duty to accommodate), the day on which he was notified of the authority's decision that the duty under this section was owed to him;

(b) if the applicant was occupying accommodation made available to him under section 200(3) (interim duty where case considered for referral but not referred), the date on which he was notified under subsection (2) of that section of the decision that the conditions for referral were not met;

(c) in any other case, the day on which accommodation was first made available to him in pursuance of the duty under this section.

(5) The local housing authority shall cease to be subject to the duty under this section if the applicant, having been informed by the authority of the possible consequence of refusal, refuses an offer of accommodation which the authority are satisfied is suitable for him and the authority notify him that they regard themselves as having discharged their duty under this section.

(6) The local housing authority shall cease to be subject to the duty under this section if the applicant—

(a) ceases to be eligible for assistance,

(b) becomes homeless intentionally from the accommodation made available for his occupation,

(c) accepts an offer of accommodation under Part VI (allocation of housing), or

(d) otherwise voluntarily ceases to occupy as his only or principal home the accommodation made available for his occupation.

(7) The local housing authority shall also cease to be subject to the duty under this section if—

(a) the applicant, having been informed of the possible consequence of refusal, refuses an offer of accommodation under Part VI, and

(b) the authority are satisfied that the accommodation was suitable for him and that it was reasonable for him to accept it and notify him accordingly within 21 days of the refusal.

(8) For the purposes of subsection (7) an applicant may reasonably be expected to accept an offer of accommodation under Part VI even though he is under contractual or other obligations in respect of his existing accommodation, provided he is able to bring those obligations to an end before he is required to take up the offer.

(9) A person who ceases to be owed the duty under this section may make a fresh application to the authority for accommodation or assistance in obtaining accommodation.

194 Power exercisable after minimum period of duty under s. 193

(1) Where a local housing authority have been subject to the duty under section 193 in relation to a person until the end of the minimum period, they may continue to secure that accommodation is available for his occupation.

(2) They shall not do so unless they are satisfied on a review under this section that—

(a) he has a priority need,

(b) there is no other suitable accommodation available for occupation by him in their district, and

(c) he wishes the authority to continue securing that accommodation is available for his occupation;

and they shall not continue to do so for more than two years at a time unless they are satisfied on a further review under this section as to those matters.

The review shall be carried out towards the end of the minimum period, or subsequent two year period, with a view to enabling the authority to make an assessment of the likely situation at the end of that period.

(3) They shall cease to do so if events occur such that, by virtue of section 193(6) or (7), they would cease to be subject to any duty under that section.

(4) Where an authority carry out a review under this section they shall make such inquiries as they consider appropriate to determine—

(a) whether they are satisfied as to the matters mentioned in subsection (2)(a) to (c), and

(b) whether any of the events referred to in subsection (3) has occurred;

and on completing the review they shall notify the applicant of their determination and of whether they propose to exercise, or continue to exercise, their power under this section.

(5) The authority may at any time, whether in consequence of a review or otherwise, give notice to the person concerned that they propose to cease exercising their power under this section in his case.

(6) The notice must specify—

(a) the day on which they will cease exercising their power under this section, and

(b) any action that they intend to take as a result,

and must be given not less than the prescribed period before the day so specified.

195 Duties in case of threatened homelessness

(1) This section applies where the local housing authority are satisfied that an applicant is threatened with homelessness and is eligible for assistance.

(2) If the authority—

(a) are satisfied that he has a priority need, and

(b) are not satisfied that he became threatened with homelessness intentionally,

they shall take reasonable steps to secure that accommodation does not cease to be available for his occupation.

This subsection has effect subject to section 197 (duty where other suitable accommodation available).

(3) Subsection (2) does not affect any right of the authority, whether by virtue of a contract, enactment or rule of law, to secure vacant possession of any accommodation.

(4) Where in pursuance of the duty under subsection (2) the authority secure that accommodation other than that occupied by the applicant when he made his application is available for occupation by him, the provisions of section 193(3) to (9) (period for which duty owed) and section 194 (power exercisable after minimum period of duty) apply, with any necessary modifications, in relation to the duty under this section as they apply in relation to the duty under section 193.

(5) If the authority—

(a) are not satisfied that the applicant has a priority need, or

(b) are satisfied that he has a priority need but are also satisfied that he became threatened with homelessness intentionally,

they shall furnish him with advice and such assistance as they consider appropriate in the circumstances in any attempts he may make to secure that accommodation does not cease to be available for his occupation.

196 Becoming threatened with homelessness intentionally

APPENDIX 5A – EXTRACT FROM THE HOUSING ACT 1996

(1) A person becomes threatened with homelessness intentionally if he deliberately does or fails to do anything the likely result of which is that he will be forced to leave accommodation which is available for his occupation and which it would have been reasonable for him to continue to occupy.

(2) For the purposes of subsection (1) an act or omission in good faith on the part of a person who was unaware of any relevant fact shall not be treated as deliberate.

(3) A person shall be treated as becoming threatened with homelessness intentionally if—

(a) he enters into an arrangement under which he is required to cease to occupy accommodation which it would have been reasonable for him to continue to occupy, and

(b) the purpose of the arrangement is to enable him to become entitled to assistance under this Part,

and there is no other good reason why he is threatened with homelessness.

(4) A person who is given advice or assistance under section 197 (duty where other suitable alternative accommodation available), but fails to secure suitable accommodation in circumstances in which it was reasonably to be expected that he would do so, shall, if he makes a further application under this Part, be treated as having become threatened with homelessness intentionally.

Duty where other suitable accommodation available

197 Duty where other suitable accommodation available

(1) This section applies if the local housing authority would be under a duty under this Part—

(a) to secure that accommodation is available for occupation by an applicant, or

(b) to secure that accommodation does not cease to be available for his occupation,

but are satisfied that other suitable accommodation is available for occupation by him in their district.

(2) In that case, their duty is to provide the applicant with such advice and assistance as the authority consider is reasonably required to enable him to secure such accommodation.

(3) The duty ceases if the applicant fails to take reasonable steps to secure such accommodation.

(4) In deciding what advice and assistance to provide under this section, and whether the applicant has taken reasonable steps, the authority shall have regard to all the circumstances including—

(a) the characteristics and personal circumstances of the applicant, and

(b) the state of the local housing market and the type of accommodation available.

(5) For the purposes of this section accommodation shall not be regarded as available for occupation by the applicant if it is available only with assistance beyond what the authority consider is reasonable in the circumstances.

(6) Subsection (1) does not apply to the duty of a local housing authority under—

- section 188 (interim duty to accommodate in case of apparent priority need),
- section 190(2)(a) (limited duty to person becoming homeless intentionally), or
- section 200(1), (3) or (4) (interim duties where case is considered for referral or referred).

Appendix 5b – Extract from the Homelessness Act 2002

An Act to make further provision about the functions of local housing authorities relating to homelessness and the allocation of housing accommodation; and for connected purposes.

[26th February 2002]

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

Homelessness reviews and strategies

1 Duty of local housing authority to formulate a homelessness strategy

(1) A local housing authority ("the authority") may from time to time—

(a) carry out a homelessness review for their district; and

(b) formulate and publish a homelessness strategy based on the results of that review.

(2) The social services authority for the district of the authority (where that is a different local authority) shall give such assistance in connection with the exercise of the power under subsection (1) as the authority may reasonably require.

(3) The authority shall exercise that power so as to ensure that the first homelessness strategy for their district is published within the period of twelve months beginning with the day on which this section comes into force.

(4) The authority shall exercise that power so as to ensure that a new homelessness strategy for their district is published within the period of five years beginning with the day on which their last homelessness strategy was published.

(5) A local housing authority shall take their homelessness strategy into account in the exercise of their functions.

(6) A social services authority shall take the homelessness strategy for the district of a local housing authority into account in the exercise of their functions in relation to that district.

(7) Nothing in subsection (5) or (6) affects any duty or requirement arising apart from this section.

2 Homelessness reviews

(1) For the purposes of this Act "homelessness review" means a review by a local housing authority of—

(a) the levels, and likely future levels, of homelessness in their district;

(b) the activities which are carried out for any purpose mentioned in subsection (2) (or which contribute to their achievement); and

(c) the resources available to the authority, the social services authority for their district, other public authorities, voluntary organisations and other persons for such activities.

(2) Those purposes are —

(a) preventing homelessness in the district of the authority;

(b) securing that accommodation is or will be available for people in the district who are or may become homeless;

(c) providing support for people in the district—

(i) who are or may become homeless; or

(ii) who have been homeless and need support to prevent them becoming homeless again.

(3) A local housing authority shall, after completing a homelessness review—

(a) arrange for the results of the review to be available at its principal office for inspection at all reasonable hours, without charge, by members of the public; and

(b) provide (on payment if required by the authority of a reasonable charge) a copy of those results to any member of the public who asks for one.

3 Homelessness strategies

(1) For the purposes of this Act "homelessness strategy" means a strategy formulated by a local housing authority for—

(a) preventing homelessness in their district;

(b) securing that sufficient accommodation is and will be available for people in their district who are or may become homeless;

(c) securing the satisfactory provision of support for people in their district—

(i) who are or may become homeless; or

(ii) who have been homeless and need support to prevent them becoming homeless again.

(2) A homelessness strategy may include specific objectives to be pursued, and specific action planned to be taken, in the course of the exercise of—

(a) the functions of the authority as a local housing authority; or

(b) the functions of the social services authority for the district.

(3) A homelessness strategy may also include provision relating to specific action which the authority expects to be taken—

(a) by any public authority with functions (not being functions mentioned in subsection (2)) which are capable of contributing to the achievement of any of the objectives mentioned in subsection (1); or

(b) by any voluntary organisation or other person whose activities are capable of contributing to the achievement of any of those objectives.

(4) The inclusion in a homelessness strategy of any provision relating to action mentioned in subsection (3) requires the approval of the body or person concerned.

(5) In formulating a homelessness strategy the authority shall consider (among other things) the extent to which any of the objectives mentioned in subsection (1) can be achieved through action involving two or more of the bodies or other persons mentioned in subsections (2) and (3).

(6) The authority shall keep their homelessness strategy under review and may modify it from time to time.

(7) If the authority modify their homelessness strategy, they shall publish the modifications or the strategy as modified (as they consider most appropriate).

(8) Before adopting or modifying a homelessness strategy the authority shall consult such public or local authorities, voluntary organisations or other persons as they consider appropriate.

(9) The authority shall—

(a) make a copy of each document published under this section available at its principal office for inspection at all reasonable hours, without charge, by members of the public; and

(b) provide (on payment if required by the authority of a reasonable charge) a copy of a document so published to any member of the public who asks for one.

Appendix 5b – Extract from the Homelessness Act 2002

4 Sections 1 to 3: interpretation

In sections 1 to 3—

- "homeless" and "homelessness" have the same meaning as in Part 7 of the Housing Act 1996 (c. 52) (in this Act referred to as "the 1996 Act");
- "local housing authority" and "district" have the same meaning as in the Housing Act 1985 (c. 68);
- "social services authority" means a local authority for the purposes of the Local Authority Social Services Act 1970 (c. 42);
- "support" means advice, information or assistance; and
- "voluntary organisation" has the same meaning as in section 180(3) of the 1996 Act.

Other functions relating to homelessness

5 Provision of accommodation for persons not in priority need who are not homeless intentionally

(1) In section 192 of the 1996 Act (duty to persons not in priority need who are not homeless intentionally), after subsection (2) there is inserted—

"(3) The authority may secure that accommodation is available for occupation by the applicant."

(2) In section 195 of the 1996 Act (duties in cases of threatened homelessness), after subsection (8) (as inserted by paragraph 14 of Schedule 1) there is inserted—

"(9) If the authority—

(a) are not satisfied that the applicant has a priority need; and

(b) are not satisfied that he became threatened with homelessness intentionally,

the authority may take reasonable steps to secure that accommodation does not cease to be available for the applicant's occupation."

6 Abolition of minimum period for which an authority is subject to main homelessness duty

(1) For subsections (3) and (4) of section 193 of the 1996 Act (period for which main homelessness duty is owed to person with priority need) there is substituted—

"(3) The authority are subject to the duty under this section until it ceases by virtue of any of the following provisions of this section."

(2) Subsection (1) applies to a person who, immediately before the commencement of this section, is owed the duty under section 193 as it applies to a person who comes to be owed that duty after that commencement.

(3) Section 194 of the 1996 Act (power to continue to secure accommodation after minimum period) shall cease to have effect.

(4) Any person who, immediately before the commencement of this section, is a person in relation to whom a local housing authority are exercising their power under section 194 of the 1996 Act shall be treated at that commencement as a person to whom the authority owe the duty under section 193 of that Act.

7 Events which cause the main homelessness duty to cease

(1) Subsections (6) to (8) of section 193 of the 1996 Act (events which bring main homelessness duty to an end) are amended as follows.

(2) In subsection (6), after paragraph (c) there is inserted—

"(cc) accepts an offer of an assured tenancy (other than an assured shorthold tenancy) from a private landlord,".

(3) For subsection (7) there is substituted—

"(7) The local housing authority shall also cease to be subject to the duty under this section if the applicant, having been informed of the possible consequence of refusal and of his right to request a review of the suitability of the accommodation, refuses a final offer of accommodation under Part 6.

(7A) An offer of accommodation under Part 6 is a final offer for the purposes of subsection (7) if it is made in writing and states that it is a final offer for the purposes of subsection (7)."

(4) After subsection (7A) (which is inserted by subsection (3) above) there is inserted—

"(7B) The authority shall also cease to be subject to the duty under this section if the applicant accepts a qualifying offer of an assured shorthold tenancy which is made by a private landlord in relation to any accommodation which is, or may become, available for the applicant's occupation.

(7C) The applicant is free to reject a qualifying offer without affecting the duty owed to him under this section by the authority.

(7D) For the purposes of subsection (7B) an offer of an assured shorthold tenancy is a qualifying offer if—

(a) it is made, with the approval of the authority, in pursuance of arrangements made by the authority with the landlord with a view to bringing the authority's duty under this section to an end;

(b) the tenancy being offered is a fixed term tenancy (within the meaning of Part 1 of the Housing Act 1988 (c. 50)); and

(c) it is accompanied by a statement in writing which states the term of the tenancy being offered and explains in ordinary language that—

(i) there is no obligation to accept the offer, but

(ii) if the offer is accepted the local housing authority will cease to be subject to the duty under this section in relation to the applicant.

(7E) An acceptance of a qualifying offer is only effective for the purposes of subsection (7B) if the applicant signs a statement acknowledging that he has understood the statement mentioned in subsection (7D).

(7F) The local housing authority shall not—

(a) make a final offer of accommodation under Part 6 for the purposes of subsection (7); or

(b) approve an offer of an assured shorthold tenancy for the purposes of subsection (7B),

unless they are satisfied that the accommodation is suitable for the applicant and that it is reasonable for him to accept the offer."

(5) In subsection (8), for "subsection (7)" there is substituted "subsection (7F)" and the words "of accommodation under Part VI" shall cease to have effect.

(6) Nothing in this section affects the operation of section 193 in relation to an offer of accommodation under Part 6 which is made before the commencement of subsection (3) above.

8 Review of decisions as to suitability of accommodation

(1) In subsections (5) and (7)(a) of section 193 of the 1996 Act (cessation of main homelessness duty), after "of refusal" there is inserted "and of his right to request a review of the suitability of the accommodation".

(2) In section 202 of the 1996 Act (right to request review of decision)—

(a) in paragraph (f) of subsection (1), at the end there is inserted "or as to the suitability of accommodation offered to him as mentioned in section 193(7)"; and

(b) after that subsection there is inserted—

"(1A) An applicant who is offered accommodation as mentioned in section 193(5) or (7) may under subsection (1)(f) request a review of the suitability of the accommodation offered to him whether or not he has accepted the offer."

(3) This section comes into force on the day on which this Act is passed.

Appendix 5b – Extract from the Homelessness Act 2002

9 Abolition of duty under section 197

(1) Section 197 of the 1996 Act (duty where other suitable accommodation available) shall cease to have effect.

(2) A person who, immediately before commencement, is a person to whom a local housing authority owe the duty under section 197(2) (instead of the duty under section 193 or 195) shall be treated at commencement as a person to whom the authority owe the duty under section 193 (the main homelessness duty) or, if at that time he is threatened with homelessness, section 195(2) (duty in case of threatened homelessness).

(3) In subsection (2) "commencement" means the commencement of this section.

10 Persons claiming to be homeless who are at risk of violence

(1) In section 177 of the 1996 Act (cases when it is reasonable to continue to occupy accommodation)—

(a) in subsection (1), after "domestic violence" there is inserted "or other violence"; and

(b) for the words following paragraph (b) of subsection (1) there is substituted—

"(1A) For this purpose "violence" means—

(a) violence from another person; or

(b) threats of violence from another person which are likely to be carried out;

and violence is "domestic violence" if it is from a person who is associated with the victim."

(2) In section 198 of the 1996 Act (conditions for referral of case to another local housing authority), for subsection (3) there is substituted—

"(2A) But the conditions for referral mentioned in subsection (2) are not met if—

(a) the applicant or any person who might reasonably be expected to reside with him has suffered violence (other than domestic violence) in the district of the other authority; and

(b) it is probable that the return to that district of the victim will lead to further violence of a similar kind against him.

(3) For the purposes of subsections (2) and (2A) "violence" means—

(a) violence from another person; or

(b) threats of violence from another person which are likely to be carried out;

and violence is "domestic violence" if it is from a person who is associated with the victim."

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