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of Glasgow

McCartney, Gerry (2010) *How will the 2014 Commonwealth Games impact on Glasgow's health, and how will we know?*

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G. McCartney (2010)

How will the 2014 Commonwealth Games impact on Glasgow's health, and how will we know?

September 2010

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MFPH MRCPG MPH MBChB BSc (Hons)

Submitted for the degree of Doctor of Medicine to the University of Glasgow

Acknowledgements

Supervisors

I would like to thank Professor Phil Hanlon and Professor Lyndal Bond for their supervision and support throughout the preparation of this thesis.

Collaborators

In addition to the valuable support from my supervisors I would like to acknowledge the support of: Sian Thomas, Hilary Thomson, John Scott, Val Hamilton and David Morrison for assistance in the preparation of the systematic review; and Susie Palmer, Jo Winterbottom, Russell Jones, Ruth Kendall and Duncan Booker in the preparation of the health impact assessment. Full details of the extent of the contributions by the collaborators are given below in the author's declaration.

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Family

I would like to express my thanks to my wife Lorna and children Eilidh, Daniel and Sarah for their patience with me whilst I prepared this thesis. I would also like to thank my Dad for proof reading the thesis.

Author's Declaration

The material contained in the thesis has not previously been presented for a

higher degree in this or any other university. The research reported is my own original work which I carried out in collaboration with others as follows:

Systematic review

Sally Macintyre had the original idea for the systematic review. I designed and planned the review in collaboration with Sian Thomas and Hilary Thomson. I was the lead reviewer and Sian Thomas was a co-reviewer. Both Sian Thomas and I undertook study selection, appraisal, data extraction & tabulation, and Hilary Thomson provided advice on the review methods. John Scott and I were responsible for the grey literature searching and Val Hamilton was responsible for the database searching. Mary Robins, the staff at Glasgow University Library and the Public Health Resource Unit library at NHS Greater Glasgow & Clyde assisted in the retrieval of articles. Adam Brown and Susie Palmer provided additional grey literature. Nigel Rice and Ken Gibb gave advice on the appraisal of economic studies. Erik Lenguerrand and Elena Sautkina assisted with translation. I synthesised the data and wrote the chapter and associated paper. All the collaborators for the review critically revised the paper and approved the final version.

Health impact assessment

Duncan Booker, Susie Palmer and Jo Winterbottom had the original idea for the health impact assessment (HIA). I, along with Duncan Booker, Susie Palmer, Jo Winterbottom, Russell Jones and Ruth Kendall, developed the methodology and carried out the HIA. I drafted the associated journal paper which was amended and agreed by all the authors. The full version of the health impact assessment as published by Glasgow City Council was drafted by all the authors.

I had sole responsibility for all other sections of the thesis. Phil Hanlon and Lyndal Bond reviewed drafts of the thesis.

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List of Publications

The following publications arose from the work contained within this thesis:

1. Gerry McCartney, Sian Thomas, Hilary Thomson, John Scott, Val Hamilton, David Morrison, Phil Hanlon and Lyndal Bond. The health and socio-economic impacts of major multi-sports events: a systematic review (1978-2008). *BMJ* (2010); 340: c2369.
2. Gerry McCartney, Susie Palmer, Jo Winterbottom, Russell Jones, Ruth Kendall and Duncan Booker. A health impact assessment of the 2014 Commonwealth Games in Glasgow, Scotland. *Public Health* (2010); 124: 444-451.
3. 2014 Commonwealth Games Health Impact Assessment report: planning for legacy. Glasgow: Glasgow City Council, 2009 [Accessed at <http://www.glasgow.gov.uk/NR/rdonlyres/13B2AA3B-B065-4006-A2B8-23E0847485B4/0/CWGHIAFullReport.pdf> on 20th November 2009].
4. 2014 Commonwealth Games Health Impact Assessment: summary report. Glasgow: Glasgow City Council, 2009 [Accessed at <http://www.glasgow.gov.uk/NR/rdonlyres/91610FE6-DC18-46F4-9945-1702ECE079B3/0/CWGHIASummaryReport.pdf> on 20th November 2009].

Structured abstract

Context

The City of Glasgow is the most deprived city in the UK. Over the last 30 years the mortality rate has become an outlier when compared with the rest of the UK and rest of Europe. Even when the effects of poverty and deprivation are taken into account, the mortality and ill-health in the population is higher than would be expected (the 'Glasgow effect'). This has led to a series of health, social and economic interventions in the City designed to change these trends and improve outcomes for Glaswegians, but with limited success.

In 2007 the City placed a bid to host the 2014 Commonwealth Games. One of the stated aims of this bid was the potential for the Games to generate a positive legacy in terms of health, social and economic outcomes.

Glasgow was successful in its bid to host the Games and there have since been concerted efforts by the Scottish Government and Glasgow City Council to ensure that the potential of the Games to generate a positive legacy is fully realised.

Aims

The aim of this thesis is to consider what the impact of the Games will be on the health of Glasgow, and how the impact can be evaluated.

Methods

There are five sections to this thesis: an analysis of the Scottish Government's theory of how the event will generate impacts; a systematic review of the literature; a health impact assessment of the Games; generation of an evaluation

framework for the event; and a synthesis which considers what the net impact of the Games is likely to be.

A systematic review was undertaken to determine the evidence for these impacts from previous major multi-sport events (1978-2008). It involved a search of the following databases (ASSIA, BHI, Cochrane, Econlit, EMBASE, ERIC, HMIC, IBSS, MEDLINE/Pre-MEDLINE, PsycINFO, Sociological Abstracts, Sportdiscus, Web of Knowledge, Worldwide Political Science Abstracts) as well as a grey literature search for events occurring between 1978 and 2008. Studies of any design which assessed the health and socio-economic impacts of major multi-sport events on the host population were included. Studies using exclusively estimated data rather than actual data; investigating host population support for an event; media portrayals of host cities; or describing new physical infrastructure were excluded. Studies were selected and critically appraised by two independent reviewers. All data extraction was checked by a second reviewer. The narrative synthesis used ESRC guidelines.

The analysis of the Scottish Government's theory was based on the consultation document published shortly after the announcement that Glasgow had won the right to host the Games. The document was dissected to expose the proposed mechanisms through which change was thought likely to occur and the expected legacy outcomes. This formed a 'theory of change': an explicit chain between the intervention and outcome along which impacts are thought to occur.

A Health Impact Assessment (HIA) methodology was then used to identify the likely mechanisms of impact for the 2014 Games, including those proposed by the Scottish Government. The HIA was not used to predict the net impact of the Games

but instead to produce over 150 recommendations for City Council decision-makers detailing how the positive impacts might be maximised, and the negative impacts mitigated.

Following this, an analysis of how better quality evidence might be gathered from the 2014 Games was detailed using and critiquing the current approaches to the evaluation of complex social interventions.

The last section of the thesis draws upon the evidence collected throughout the thesis to predict the likely impacts of the 2014 Games and then consider how academics might benefit from using a 'critical pathways' approach to informing the policy-making process in the future.

Results

The systematic review included 54 studies. The study quality was poor with 69% of studies repeat cross-sectional and 85% of quantitative studies assessed as being below 2+ on the Health Development Agency appraisal scale, often because of a lack of comparison group. Five studies reported health outcomes including suicide, and hospital presentations for paediatrics, children with asthma, and illicit-drug related problems. The data did not indicate clear negative or positive health impacts. The most frequently reported outcomes were economic (18 studies) which were similar enough to perform a narrative synthesis. The overall impact on economic growth and employment was unclear. Two thirds of the economic studies reported increased economic growth or employment immediately after the event but all of these used some estimated data in their models, failed to account for opportunity costs or examined only short-term impacts. In contrast, the economic studies that did not use estimated data reported mixed impacts or a decrease in

employment and economic growth. The transport outcomes were similar enough to synthesise. The synthesis showed that event-related interventions including restricted car use and public transport promotion were associated with significant short-term reductions in traffic volume, congestion or pollution in 4 out of 5 cities.

The Scottish Government's theory of change for the Commonwealth Games was analysed and was found to contain three separate types of mechanism. Direct impacts are those arising from actions intrinsic to the hosting of the Games and which are unlikely to be replicated in their absence. This includes the development of Games-related infrastructure and the potential increase in tourism resulting from media exposure during the event. Project impacts are those arising from interventions associated with the Games, where the intervention could be implemented in another context or time without the backdrop of the event. This might include a physical activity programme branded as being part of the Games intervention. The other category of mechanism of action is catalytic impacts. These are the additional impacts expected to result from existing programmes, policies and projects in the presence of the Games. The Government document described a range of outcomes for each of its themes (healthier, wealthier and fairer, smarter, greener, safer and stronger) using these three types of mechanism.

The HIA did not make a prediction of the health or socioeconomic impact of the Games because it formed part of the corporate processes of the City council, and a prediction of the impacts was not one of the council's objectives for the HIA. Instead, the HIA made over 150 recommendations in an attempt to maximise the positive benefits and mitigate the negative impacts. The HIA concluded that the Games will most likely influence health most through impacts on the economy, civic pride, engagement in decision-making, the provision of new infrastructure and

participation in cultural events. A range of recommendations were made reflecting the available evidence and the collective wisdom of the public and participants in the HIA process. These included: a recommendation that a higher proportion of the new housing built to accommodate athletes during the event should be made available as social housing; transport policies before, during and after the event should promote active transport and make public transport more affordable and accessible; and increased public involvement in the decision-making processes about the use of the new sports infrastructure after the event. Further evaluation is required to assess how successful the HIA process was in terms of community participation and validity, on the question of how effective the HIA was at influencing policy-makers, and on whether the impacts discussed in the HIA were realised.

Evaluation of the impact of the 2014 Games is likely to be challenging because of the complex nature of the intervention. Three types of mechanism of impact were identified: project effects, direct effects and catalytic effects. The project effects arise from specific projects or programmes that are undertaken in the context of the Games, but which could be implemented in the absence of such an event. The evaluation of these could be improved if either a prospective cohort study (where the participants in the projects can be predicted in advance) or retrospective cohort study (where the participants will only be known after they have taken part) is arranged. This will require to be undertaken in combination with qualitative studies and the creation of a theory of change to understand why any such project effects are (or are not) seen. The direct impacts of the Games, that is the impacts that occur as a direct result of playing host (such as the impact on tourism), require a different approach to achieve a quality evaluation. First, a theory of change to identify the critical pathways in generating impacts should be

elucidated. Next, a combination of a cohort study and an ecological study (using routine data and a series of comparison areas identified in advance), should be used to identify the attributable impacts of the Games. Qualitative work alongside these studies will be required to understand why the impacts occur (or not). For the economic impacts specifically, an ecological design or economic modelling should be performed using routine statistical data (rather than estimates) and taking account of the opportunity costs. The catalytic impacts are particularly difficult to evaluate as it is not yet clear what these impacts might be. These potential impacts will require being identified using regular qualitative work with key individuals within the public and private sector in Glasgow, and this information will then need to be used to design quantitative studies to test these hypotheses.

The synthesis discussed whether or not the Games could legitimately be described as a health improvement intervention. It found that some of the critical steps in the intervention were very similar to the tried and tested mechanisms used over many decades in the West of Scotland in attempt to improve the health and social conditions (economic growth and improved environment), without success. The ability of the Games to impact on the other critical steps (sports participation, increased volunteering and increased pride) is not supported by the evidence from previous events, and it is difficult to see what is different about the plans for the 2014 Games that might generate a different result. It was therefore concluded that the 2014 Games are unlikely to be an effective health improvement, and are unlikely to generate the plethora of social and economic benefits that pepper the bid document and legacy plans.

Discussion

There are high expectations from Government that the 2014 Games will deliver a plethora of health and social benefits. The evidence from previous events is of poor quality, and there is an absence of evidence of positive impacts occurring. Given that a publication bias towards positive impacts is expected, it is unlikely that large positive health or socioeconomic benefits have occurred from major multi-sport events in the last 30 years.

Health impact assessment can be used as an effective method of engaging the public and can be used to inform policy-making with evidence. Although the HIA did not predict the net overall impact of the Games, it is possible to make evidence-informed recommendations that are likely to maximise the potential for positive impacts and minimise the potential for negative impacts.

The quality of evidence on the impacts of major sports events could be improved if a theory of change evaluation framework was applied to the event and if this was used to design a series of qualitative, cohort and ecological studies with appropriate comparison groups. However, it is unlikely that the 2014 Games will have a large positive impact on the health of Glaswegians or on socioeconomic outcomes because there is little evidence that the likely critical pathways have been successfully used in generating positive impacts despite similar attempts in the past. Some critics of major sports events have also made a plausible case for their being important negative consequences from playing host.

The strengths of the thesis include the use of robust methodologies for the systematic review and health impact assessment, and the innovative use of a

critical pathways approach for estimating whether or not the net impact of the Games will be positive.

The weaknesses of the thesis include the reliance on the Government's published work to discern the theory of change; the 34 studies that could not be obtained for possible inclusion in the systematic review; the limited evidence base upon which to make recommendations in the HIA; and the reliance on an accurate theory of change to predict the net impact of the Games, including the absence of emergent impacts from the complex Glaswegian context.

Conclusions

The 2014 Games are unlikely to generate a large positive impact for health or the socioeconomic determinants of health. There is potential for unintended negative consequences to occur. The impacts of the Games are most likely to be optimised if the HIA recommendations are acted upon by decision-makers, and these impacts will only be accurately known if there is work to improve the quality of the evaluation. It is possible that the marketing of the Games as an intervention for health and social improvement might deflect attention from more important determinants of health in the city. In that vein, it may be more reasonable to make few other claims for the Games than that it will provide public entertainment and a festival for the population, and to minimise the opportunity costs that the Games will generate.

1. Introduction and literature review

1.1. Overview of chapter

This chapter introduces the thesis by discussing the health of the population of Glasgow, the trends in health outcomes and the challenges faced. It then goes on to review the determinants of health, that is the things within individuals, families, communities and society, that influence health outcomes. This provides a basis for discussing the policy context in Glasgow and how these policies are designed to improve the health of the City's residents.

There is then an overview of the bid, submitted by Glasgow City Council and its partner organisations, to bring the 2014 Commonwealth Games to the City, and the hopes and aspirations that have been pinned on the Games.

There is then a summary of the known impacts from previous events similar to the Commonwealth Games and how these impacts have been evaluated.

1.2. Introduction

The City of Glasgow is to host the Commonwealth Games in 2014. The decision to bid to host the event was taken jointly by Glasgow City Council and the Scottish Government. The principal reason given for the City Council and Scottish Government deciding to put in a bid to host the event was that it would provide an opportunity to generate a positive legacy for the City and the nation as a whole. This was expected to include economic benefits, a cultural legacy, health improvement, urban regeneration and an improvement in the international perception of the City.¹

It is known that health is enhanced and damaged by a range of socio-economic influences present in society. These influences are almost identical to the anticipated 'legacy' benefits from playing host to the Games. Glasgow has the worst health record in the UK and has higher mortality rates than most other European countries. This is despite decades of concerted health improvement activities which have attempted to improve health, yet Glasgow's health statistics remain stubbornly resistant to the kind of improvement that would bring it into line with its neighbours. Since the predicted legacy benefits of the Games are synonymous with the societal factors that influence health, hosting the Games may be an important and novel method of providing the much needed improvement in the health of the population.

This thesis considers whether the 2014 Commonwealth Games are likely to bring the predicted health and social benefits for the population of Glasgow; how we can learn what the actual impact is; and draws conclusions on whether the Games can reasonably be considered to contribute to health improvement.

1.3. The health of the Glasgow population

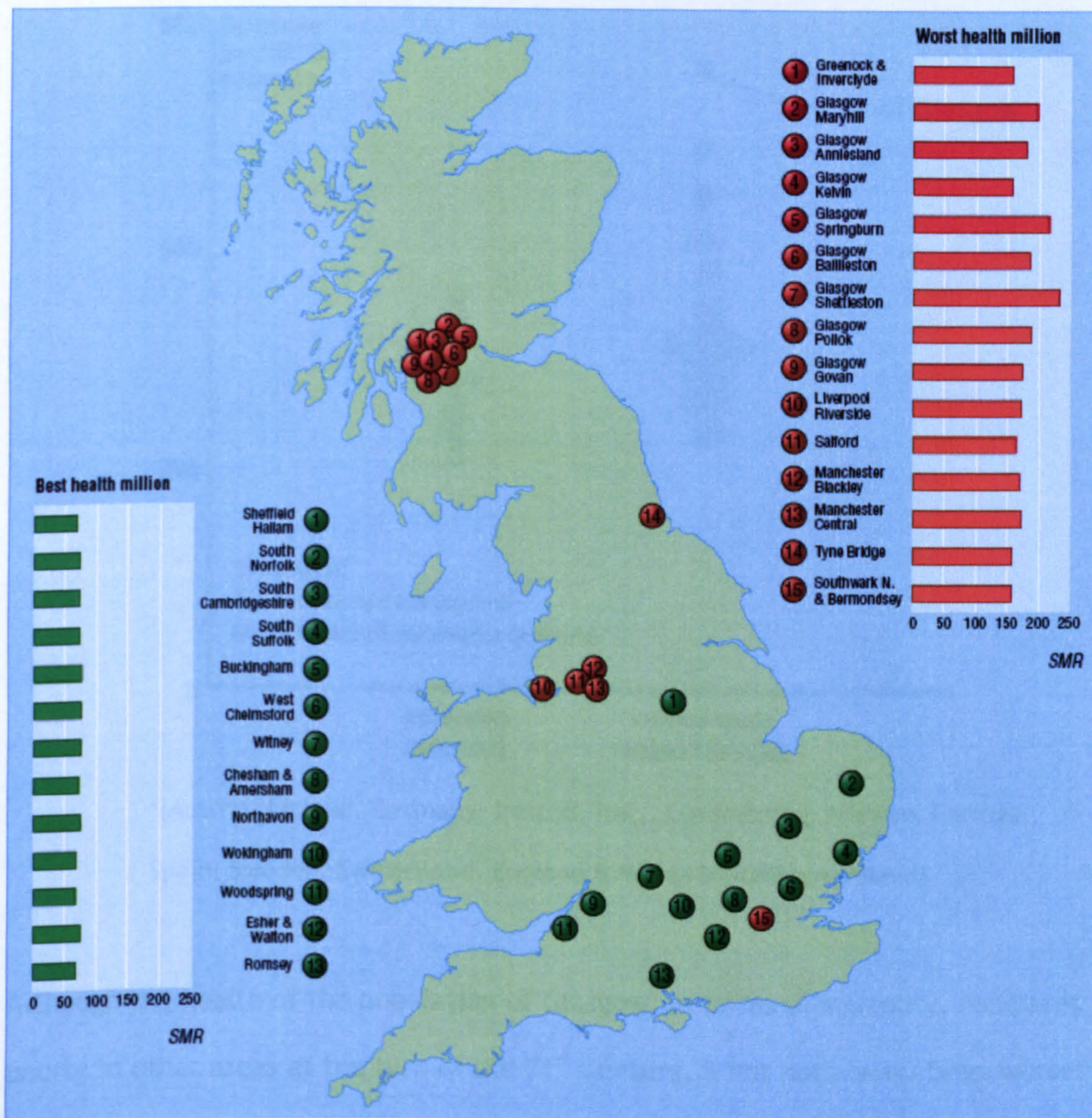
Glasgow is a large post-industrial city situated at the mouth of the river Clyde in West Central Scotland (Figure 1). It was said in the past to have been the second most important city in the British Empire and it has a proud history of social, economic and cultural development.²⁻⁴ Despite these historical assets, the health of the Glasgow population has become the City's Achilles' heel.⁵

Perhaps the starkest demonstration of the lagging health outcomes in Glasgow was an analysis performed by Shaw et al. They sought to identify the geographical location of the million people in the UK with the highest mortality, using UK parliamentary constituencies as their unit of analysis (geographical units containing approximately 80,000 people). Of the 15 constituencies accounting for this population with the highest mortality, eight (including the five highest) were to be found within the City of Glasgow (Figure 2).⁶

Figure 1 - The geographical location of the City of Glasgow



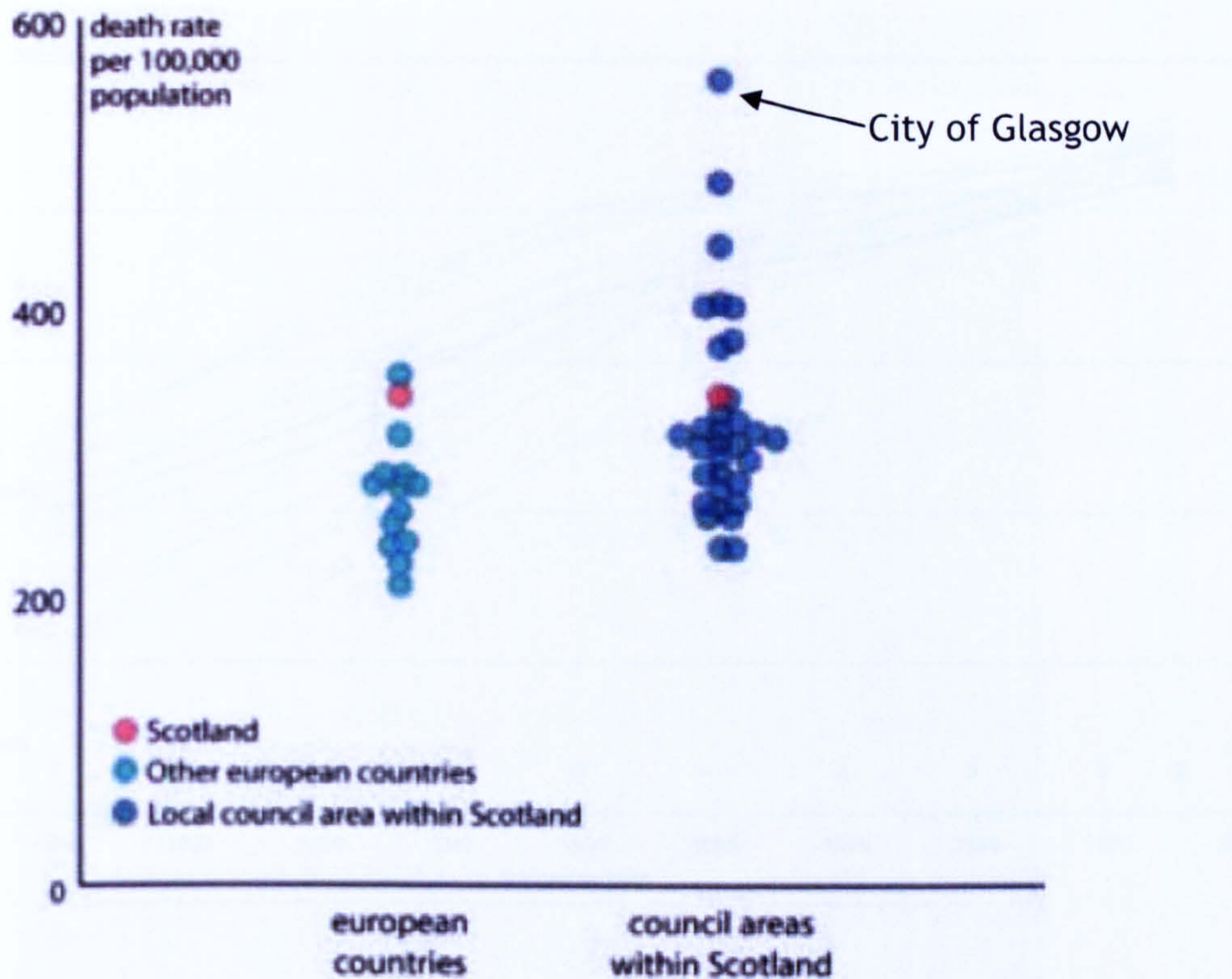
Figure 2 - A map of the British parliamentary constituencies containing the million people with the highest, and million people with the lowest, mortality rates* (from Shaw et al 2005)⁶



*(SMR for deaths <65 years 1991-5; the average SMR for England & Wales = 100)

Using local authority areas as a unit of analysis (usually much larger than parliamentary constituencies) Leyland et al demonstrated that the standardised mortality rate within the City of Glasgow is an outlier in comparison with other areas within Scotland, and to other Western European countries (Figure 3).⁷

Figure 3 - A comparison of all-cause standardised mortality rates for selected European countries* and for all local authority areas within Scotland (for males aged 0-64 years in 2001) (from Leyland et al)⁷



*(Austria, Finland, Germany, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland, England & Wales & Northern Ireland)

Although the health of the population of Glasgow, in terms of mortality, compares poorly to other areas at the turn of the 21st Century, it has not always been worse than comparable cities. Using Scotland as a focus rather than Glasgow, Leon used life expectancy (at birth) to show that for the first half of the 20th Century Scottish trends were comparable with other Western European countries, with Scotland having a life expectancy of approximately the median of the ranked countries and an improvement rate similar to the others.⁸ It was only in the latter half of the 20th Century that the rate of improvement in Scotland started to diverge from that of the other countries, to leave life expectancy at or near the bottom of the ranking (Figures 4 & 5).

Figure 4 - Male life expectancy trends for Scotland and 16 other Western European countries (from Leon 2003)⁸

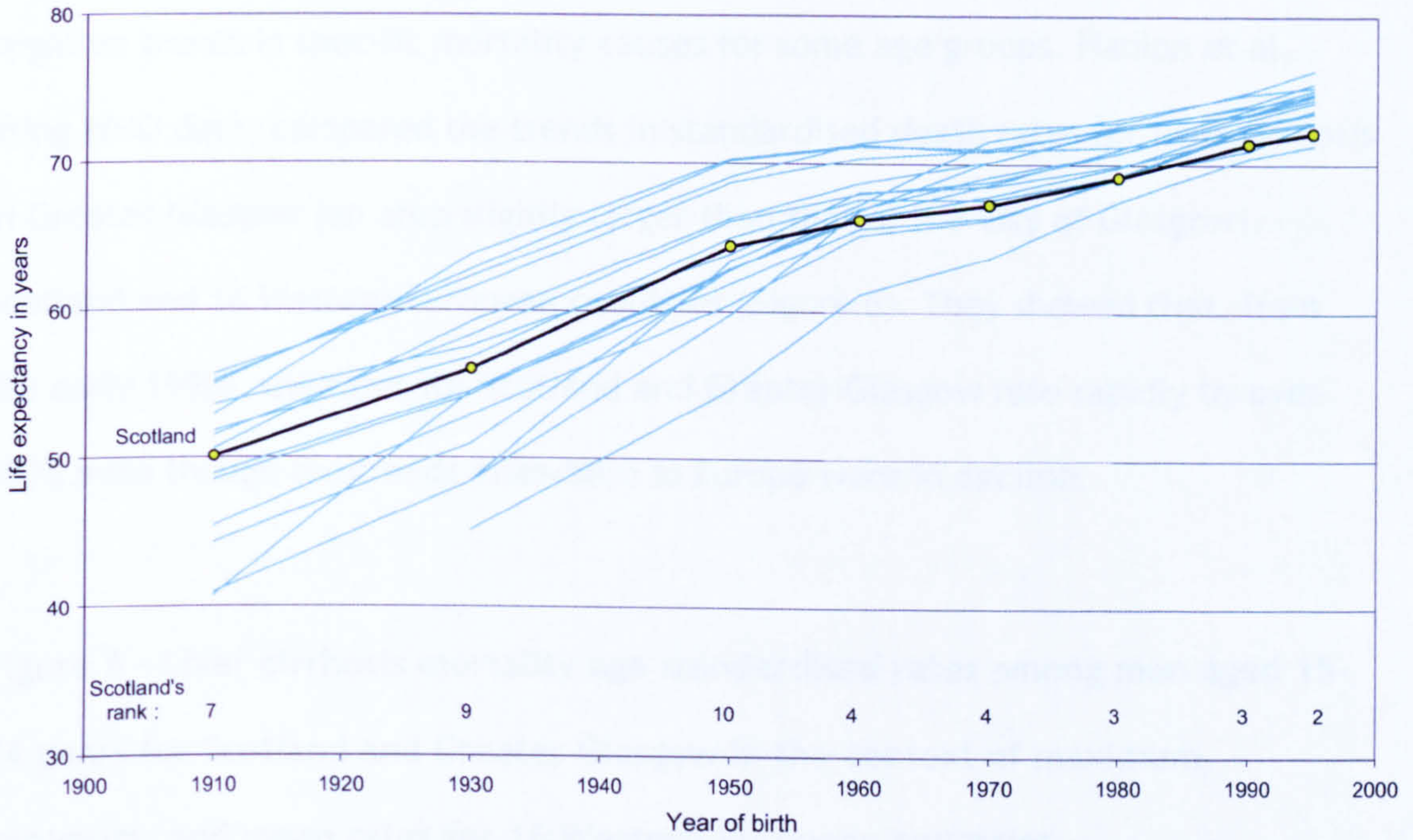
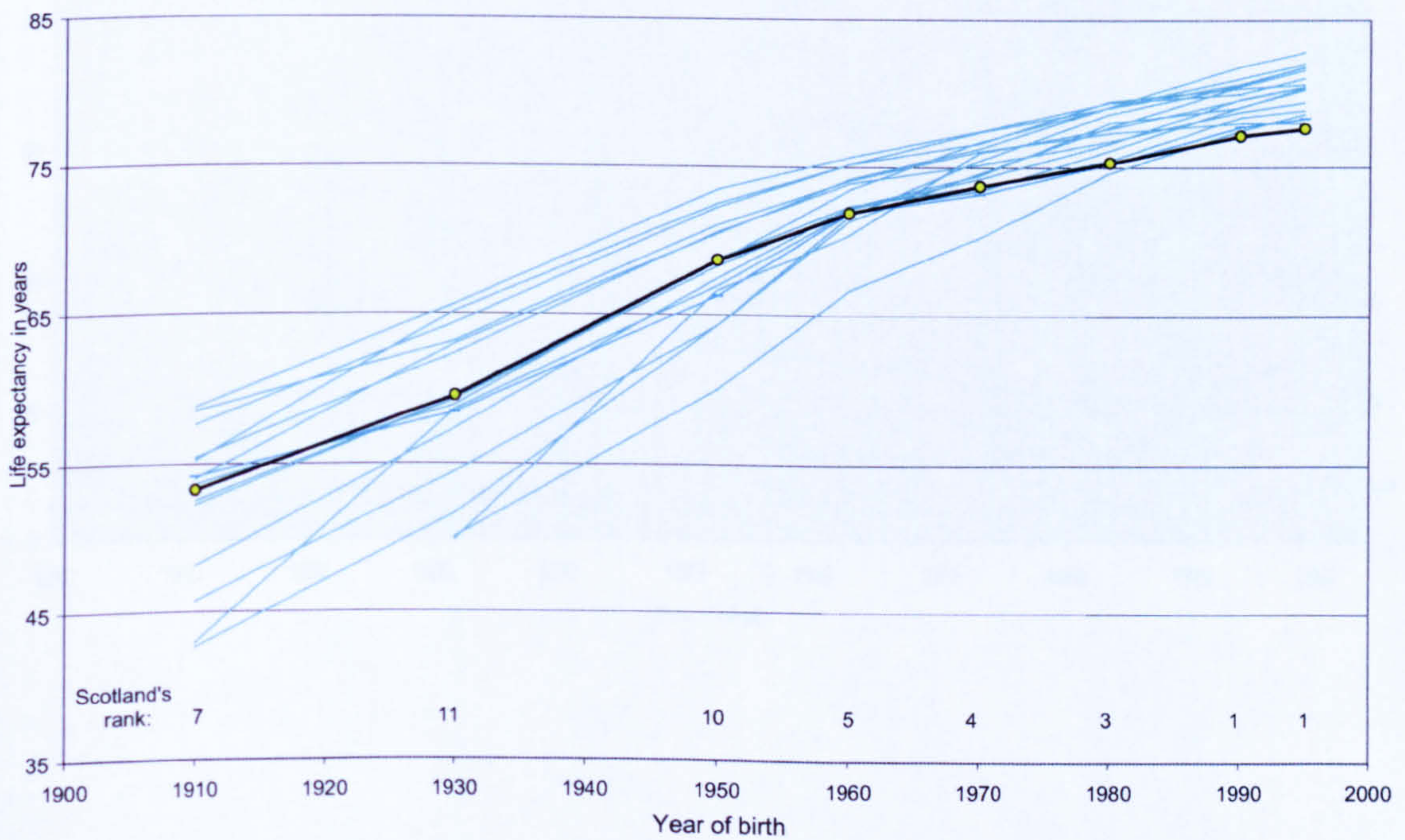
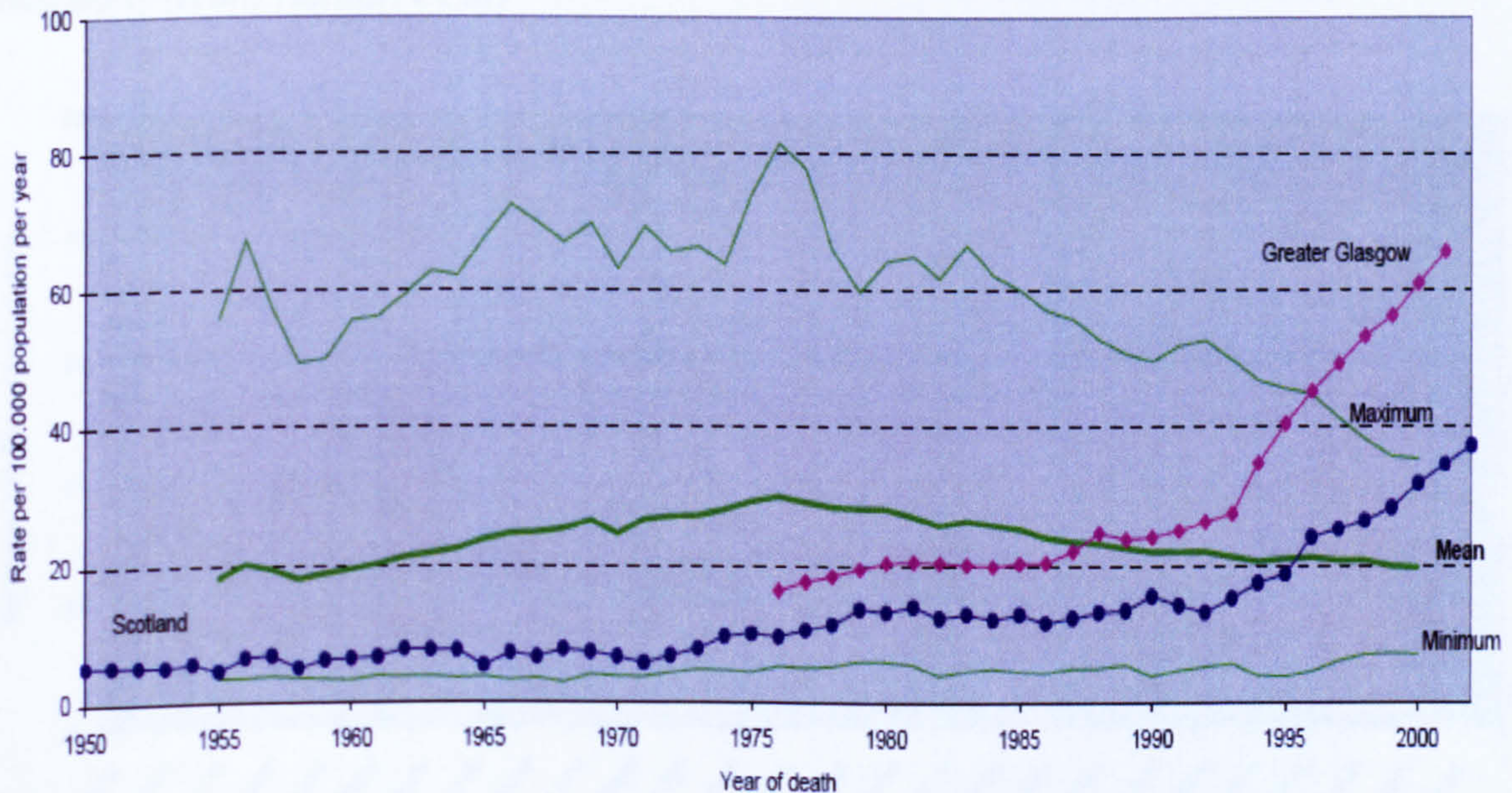


Figure 5 - Female life expectancy trends for Scotland and 16 other Western European countries (from Leon 2003)⁸



The relative decline in the Scottish ranking in life expectancy is due to a slower rate of improvement in Scotland than in the comparison nations. Despite this overall improvement in life expectancy for Scotland (and Glasgow), there are some negative trends in specific mortality causes for some age groups. Hanlon et al, using WHO data, compared the trends in standardised death rates for liver cirrhosis in Greater Glasgow (an area slightly larger than that of the City of Glasgow), Scotland and 16 Western European countries (Figure 6). They showed that, from the early 1990s, the rates for Scotland and Greater Glasgow rose rapidly by over 300% even though the trends elsewhere in Europe were in decline.

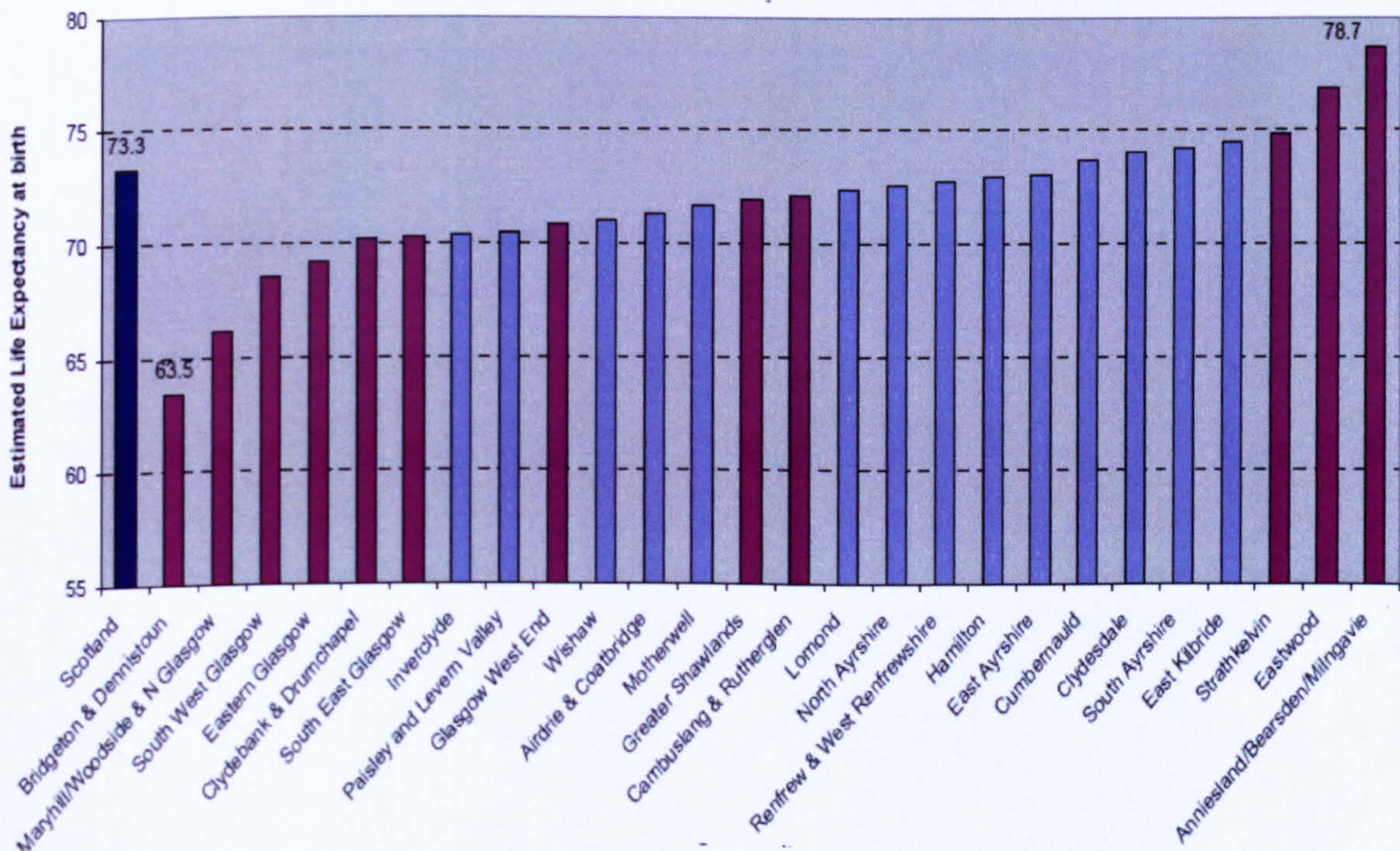
Figure 6 - Liver cirrhosis mortality age standardised rates among men aged 15-74 years for Scotland and Greater Glasgow in the context of maximum, minimum, and mean rates for 16 Western European countries



In addition to the trends for alcohol-related deaths, other trends have worsened over the last 30 years. Deaths due to alcohol excess, suicide, road-traffic accidents and violence have all increased, as have the prevalence of some morbidities such as mental health problems and obesity.⁵

Although the mean health of the Glasgow population is relatively poor, it is not ubiquitously so. There are large inequalities in the health outcomes within Glasgow when small areas of affluence and deprivation are compared. These inequalities are even greater if the small areas within the wider West of Scotland conurbation are compared with Glasgow, as there is a large affluent community which lives outside the City boundary.^{5, 9} Figure 7 shows that there is a gap of over 13 years in male life expectancy at birth in areas within Glasgow.

Figure 7 - Male life expectancy at birth for West of Scotland communities, 1998-2002 (areas within the former NHS Greater Glasgow boundary are coloured maroon) (from Hanlon et al)⁵



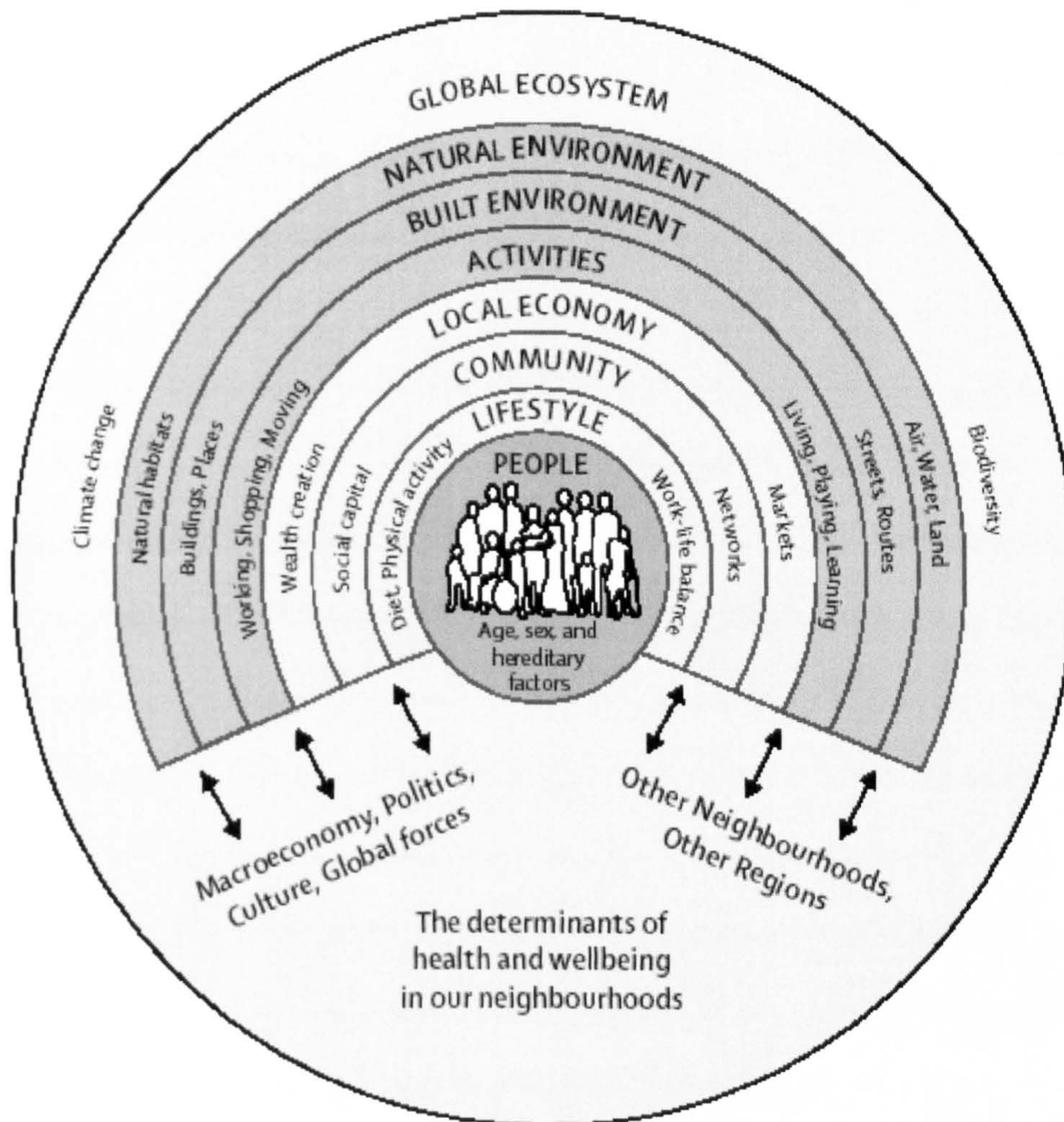
It therefore clear that the health of the population of Glasgow, both in terms of mortality and morbidity, is the worst in Scotland and the worst in the UK. Furthermore, the mortality data for Scotland as a whole compares badly to other European nations. Health outcomes in Scotland and Glasgow are improving on the whole, but at a slower rate than their neighbours such that since the latter half of the 20th Century they have been left behind. The next section will explore some of the factors that determine the health of populations and consider which factors might explain this relative decline in the health of the Glasgow population.

1.4. The determinants of health

Health is enhanced and damaged by a complex interplay of influences at the individual, family, community, national and international levels (Figure 8). This means that everything from the genetic endowment that individuals carry, through the behavioural choices that individuals make, to the family and community influences which surround people, to the policies in place in the country of residence (and beyond), and the environment to which people are exposed, all have some role in determining the health of individuals and populations.^{10, 11} These linkages are complex and interdependent, and it can be very difficult to ascertain direct pathways of influence.

The complexity of influences on health was well illustrated by the UK Government's Foresight project on obesity. This sought to describe all of the factors that have contributed to the observed international epidemic in obesity. It concluded that factors at all levels of society, from individual lifestyle choices through to the policies of the World Trade Organisation (WTO) had some influence on the phenomenon.¹²

Figure 8 - The determinants of the health of populations from individual factors through to global influences (from Rao)¹³



Another dimension to the determinants of health is the timing of exposure to the various influences across the life-course (the lifetime of individuals).¹⁴ This complicates the relationship between the determinants of health and health outcomes, since it is perfectly plausible that an exposure in childhood may not manifest as a health outcome until adulthood, creating the potential for large and variable time lags between exposures and outcomes. The most famous example of such an exposure is that proposed by Barker.¹⁵ He proposed that exposure to a nutrient-poor environment whilst in-utero could 'programme' the body to maximise the storage and utilisation of nutrients (the so-called 'thrifty phenotype') for the

rest of the individual's life. This would mean that those conceived at the time of a famine, might be predisposed to developing obesity in later life as the period of famine passes. The implication of this in trying to explain the lagging health outcomes for the City, as elsewhere, is that the causative factors may not be found at the time of the changes in health trends, but perhaps a generation or more before the health outcomes were observed.

One of the most important factors in explaining the lagging health outcomes in Glasgow has been its relative poverty and socio-economic deprivation in comparison to other areas of the UK. This greater poverty and deprivation in Scotland explained approximately two thirds of the excess mortality at the time of the 1981 census.¹⁶ Poverty and deprivation is known to translate to poor health outcomes through a plethora of pathways including material deprivation (e.g. lack of access to healthy food or inadequate housing),^{17, 18} psychosocial pathways (e.g. the stresses related to the pervasive social comparisons for those living in deprived circumstances),¹⁹ lack of employment or unfulfilling employment²⁰ and unhealthy behaviours (such as smoking and excess alcohol consumption).^{17, 21, 22}

Since 1981 however, the ability of poverty and deprivation to explain the excess mortality in Scotland has diminished from explaining around two thirds of the excess to less than one half by 2001. The reason(s) for this excess mortality in comparison to other areas, unexplained by deprivation, is unclear. This has been termed the '*Scottish Effect*', although it is recognised that this effect is more profound in the West of Scotland in general and in the City of Glasgow in particular (the '*Glasgow Effect*').^{16, 23, 24} This suggests that, although deprivation remains the most important explanatory factor for the excess mortality, there are other factors that either intensify the effects of deprivation or act through other pathways to

generate poor health outcomes. For example, it is known that Scots (and Glaswegians in particular) are more likely to die of illicit-drug related deaths,²⁵ alcohol-related deaths^{21, 22} and violent deaths.⁵ What is unclear is why these behavioural, cultural and social problems constellate in the City to a greater extent than that which deprivation alone might explain.

The most prominent theory to explain the rise in excess mortality is that the deindustrialisation of Scotland (and the West of Scotland and Glasgow in particular) was more profound than in other areas of the UK, and that this led to greater unemployment, hopelessness and socio-economic disruption.²⁴ However, Walsh et al compared the health and socio-economic trends in Glasgow and the West of Scotland with other deindustrialised areas in Europe (such as the Ruhr in Germany and Nord-Pas-de-Calais in France in Western Europe, and areas of Eastern Europe such as Silesia and Katowice) and found that, despite higher unemployment and greater poverty, the health outcomes in other deindustrialised areas were either better or improving more rapidly.^{16, 24, 26} This finding suggests that, in a European context, poverty, deprivation and deindustrialisation *per se* are not responsible for the higher mortality in Glasgow.

In summary, poverty and deprivation remain important factors in explaining the higher mortality in Glasgow, but other factors are also involved, and these are likely to be more than simply unemployment or deindustrialisation. Various other theories have been proposed which are undergoing further exploration: that Glasgow suffers from greater income inequality; that the rapidity and depth of deindustrialisation was more profound in the City; that there is a cultural lack of confidence amongst the population;²⁷ and that deindustrialisation in Glasgow was experienced as a political attack with a consequent undermining of community and

working class organisations in contrast to more mitigated processes elsewhere from 1979.²⁸

1.5. The policy context of Glasgow

Governance structures

The governance of the City of Glasgow has changed over the past 25 years. In common with the rest of the UK, the regional metropolitan authority (Strathclyde regional council) was abolished in 1996 and replaced with smaller local authorities. This meant that the more deprived and needy areas of the region were concentrated in three local authority areas (The City of Glasgow, West Dunbartonshire and Inverclyde) with the wealthier areas on the periphery of the City (most notably East Renfrewshire and East Dunbartonshire) becoming autonomous. The City of Glasgow thus became the local authority for over 500,000 people resident within the City boundary, and the population with the greatest health and social needs in the UK.

The City council is responsible for delivering education, social work, local transport, housing, planning and leisure services for its population. It does this using a combination of a block grant from the Scottish Government supplemented with income from the locally-levied council tax and business rates. These council taxes have been levied at a higher rate than in the surrounding local authorities for two principal reasons. First, the cost of providing services to a needier population is greater and the council argues that these costs are greater than the additional income it receives from the Government; and second, the residents in the surrounding local authority areas utilise the services within the City (such as museums and art galleries) that are not funded by those local authorities. Since the break-up of the regional authority, this has led to ongoing tensions and initiatives to resolve these issues, the most recent being the Arbutnott review into the

potential for the former Strathclyde region local authorities to develop a number of shared functions to minimise costs.²⁹

In 1999 the Scottish Parliament was established with powers devolved from the UK Parliament at Westminster. These powers included limited tax-raising powers, health policy, local government, culture and sport, housing, some transport policies and education. The UK Government retained power over welfare, fiscal, foreign and defence policies.

Each of these layers of government (the City of Glasgow local authority, the Scottish Government and the UK Government) are elected periodically and, for the first 8 years of the Scottish parliament (1999-2007), had produced majority representation for the Labour party at each level for the City. However, in 2007 the Scottish parliamentary election produced, for the first time, a Scottish Government led by the Scottish National Party (SNP), creating a new political tension between the different layers of government not seen since the Conservative party was in power at Westminster prior to 1997.

The National Health Service (NHS) in Scotland is accountable to the health minister in the Scottish Government. The health minister devolves operational control of the NHS to a series of geographical and national health boards which are currently unelected but have representation from each of the local authorities in their area. The boundaries of the health boards and local authorities are not contiguous, although there have been moves across Scotland to devolve power from the health boards to Community Health Partnerships (CHPs) or Community Health and Care Partnerships (CHCPs), which are aligned to local authority boundaries, as a means to improving the co-ordination between local authority service providers and the

NHS, and to improve local accountability. The City of Glasgow, unlike other neighbouring local authorities which have a single CH(C)P within their boundary, set up five CHCPs in the City to deliver primary health care services and social services. This has generated a further layer of complexity to the governance structure for public services in the City, although it may also have delivered greater accountability to the public through the stronger link to the elected local authority councillors.

Policy in the City of Glasgow

Glasgow City Council has adopted five key objectives for the period 2008-2011:

1. Improving the efficiency and effectiveness of services
2. Increasing access to lifelong learning
3. Making Glasgow a cleaner, safer city
4. Building a prosperous city [and]
5. Improving health and wellbeing.

These objectives have been supplemented by the council plan which highlights the actions the council are taking to: “reduce our spending; encourage and support city business; and develop or redesign existing services”.³⁰ This accurately reflects the policy direction of the council which involves: transfer of service departments to private bodies or arms-length companies (e.g. housing services were transferred to the Glasgow Housing Association Ltd, and leisure services were transferred to Culture and Sport Glasgow Ltd);³¹ the centralisation and consolidation of remaining services (e.g. the closure and merger of a number of primary schools and the proposals to share service provision between the Clyde Valley local authorities as per the Arbutnott review); prioritisation of supply-side economic measures to

encourage economic growth (e.g. marketing the City to potential investors; the development of the ‘financial services district’ in the Broomielaw area including spending on ‘public realm’ works; and a focus on the ‘employability’ of its population).³²

In short, Glasgow City Council see their primary goal as being able to compete for capital investment into the City as a means to creating employment and wealth for use in the provision of services. In this way, it has much in common with the policy objectives of other cities and Governments, not least the Scottish and UK Governments.³³

Scottish Government policy

The stated purpose of the Scottish Government is to, “create a more successful country where all of Scotland can flourish through increasing sustainable economic growth”.³⁴ This is elaborated on using five overall themes (wealthier and fairer; safer and stronger; smarter; greener; and healthier) for the activities of the Government. These policy objectives are not in conflict with those of Glasgow City Council, although there often party political disagreements between the two, such as the recent decision to cancel the rail-link to Glasgow airport.³⁵

1.6. Health policy in Scotland

There have been a plethora of health and social initiatives in Scotland over the last 20 years designed to tackle the poor health outcomes, health inequalities and the widespread negative social influences on health. Many of these initiatives have taken the form of pilot projects which sought to find methods of improving the health of the most deprived groups in the country and thereby narrow health inequalities.³⁶

The latest policy document, published by the incoming Scottish Government in 2007, was entitled 'Better Health, Better Care'.³⁷ Much of 'Better Health, Better Care' focussed on health service development rather than the wider determinants of health. For example, the Government outlined how it wished to pursue a 'mutual' health service model in contrast to the more commodified and commercial models adopted by the previous administration. However, it also led to a 'Taskforce on Health Inequalities' being set up involving all Scottish Government ministers, input from a number of public health experts and commissioned evidence reviews. The resulting report had a much broader focus than the original policy document and examined the potential for a range of social policies to influence health and health inequalities (e.g. fiscal, welfare, regeneration and housing policies).³⁸ Following the publication of the report of the Taskforce (Equally Well), an implementation plan was developed which involved a series of 'test sites' to implement and test some of the most likely actions to narrow health inequalities.³⁹ These were: targeting high smoking rates with intensive support for smoking cessation; targeting inequalities in pre-nursery children using innovative health visiting practices; community development work in a community on Glasgow's South side; using 'inequalities-sensitive practice' for individuals with

complex needs; focussed activity on employability interventions; actions to reduce teenage alcohol consumption; well-being interventions in a community in Dundee; and integrating health priorities into urban planning in Glasgow. Each of these initiatives utilises the same method as those of previous Government initiatives: intensive support for health and social interventions in a small geographical community alongside an evaluation framework which allows for learning to be gathered and shared more widely. The principal difference with previous initiatives aimed at the reduction of health inequalities is the inclusion of a number of pilots outwith the traditional areas of health promotion (e.g. urban planning).

The Scottish Government's increasing focus on the social determinants of health has also led it to propose minimum pricing for alcohol (a legal measure which would ensure that no alcohol was sold below a minimum price per unit thereby increasing the price of the brands of alcohol most commonly abused by the heaviest alcohol drinkers). These measures take a step beyond the historical pattern of 'educating' the public about the dangers of smoking or drinking alcohol, towards a policy of using legal restrictions to make the healthier behaviours the most easy to adopt. Public health priorities have therefore gained a foothold in the Scottish Government in recent years where they had not in the past, although the overall objective of 'sustainable economic growth' remains the most important factor in its decision-making where this comes into conflict with public health policy.⁴⁰

1.7. The 2014 Commonwealth Games bid

In November 2004 a 'bid assessment group' was set up to look at the potential that hosting the Commonwealth Games might have to generate long-term benefits for Glasgow and Scotland. A report was commissioned from PMP consultants to look at the costs and merits of a bid based on Glasgow. The commissioned report concluded that there were 'substantial merits' to a Glasgow bid, and that the City had a good chance of winning the right to host the Games without incurring excessive costs. This was largely because many of the required sporting venues and transport infrastructure were already in place or already being planned.⁴¹

An agreement was reached between Glasgow City Council and the Scottish Executive (the Scottish Executive was rebranded as the Scottish Government in 2007) in 2005 that the Commonwealth Games Federation for Scotland would put in a bid to host the event in the City of Glasgow for the 2014 Commonwealth Games. The bid was supported by the Scottish Executive, Glasgow City Council and, to a large degree, the population of Scotland.⁴¹ The then First Minister of Scotland, Jack McConnell said at the launch of the bid, "Taking the bold step to bring one of the largest events in the world to Scotland shows the scale of ambition as a nation and the confidence we have in our biggest city".

An interim organising committee was formed involving the Scottish Executive, Glasgow City Council, the Commonwealth Games Federation for Scotland and other partners to lobby for the bid. There were clearly a variety of motivations for these different groups being involved in the bid: Glasgow City Council and the Scottish Executive supported the bid principally as a means to leverage investment into the City and to encourage tourism, but were also cognisant of the potential for health

and social benefits of playing host; the population's principal motivation in supporting the event was to facilitate a rebranding of the City and to engender a pride once again in the City;⁴² whereas the numerous business partners who supported the bid considered the potential marketing opportunities as the most valuable reasons for bidding.^{1, 42}

The decision to award the Games rested on a vote of delegates from all 71 countries and territories of the Commonwealth Games Federation on the 9th November 2007. Prior to this, the interim organising committee hosted a visit for delegates to Scotland, and visited a total of 67 countries to lobby for the Glasgow bid. There were initially two other bidding cities: Ajuba in Nigeria; and Halifax in Canada. Halifax pulled out from the bidding process in March 2007 because the organising committee there could not close the gap between the projected costs of hosting the Games and the projected income from the event.⁴³ The Glasgow bid then won in the run off between the two remaining cities to win the right to host the Games.

1.8. Preparation for the 2014 Commonwealth Games

As part of the bid document, a number of infrastructure projects were detailed that were needed if the City of Glasgow was to host the Games. These were:

- **The athletes' village** Planned for the Dalmarnock area in Glasgow's East End. It involves building 1,400 houses to provide for 6,500 athletes and officials during the event. These will then be converted into residential housing afterwards (including 300 houses for rent and a 120 bed care home).
- **Cathkin braes** This is an area of parkland on the Southern edge of the City which is to have a mountain bike circuit created within its boundaries.
- **Glasgow Green Centre** This is a public park near the centre of the City which is to have a new hockey centre constructed on it including two synthetic pitches, changing facilities and spectator accommodation.
- **National Indoor Sports Arena**

This new facility is to be built in Dalmarnock to host the badminton events. It will be adjacent to the athletes' village, velodrome and Celtic park stadium.
- **Scottish National Arena** This will be constructed to host the gymnastics and netball events in the area next to the existing conference centre (SECC) and to the Clyde Auditorium (Armadillo).

- **Velodrome** The ‘Sir Chris Hoy’ velodrome is to be constructed next to the National Indoor Sports Arena, Celtic Park and the athletes’ village. This will host all of the track cycling events.

- **Tollcross aquatics centre**

There is an existing 50m swimming pool at Tollcross which is to have an additional 50m pool constructed in the same building as an additional ‘warm-up’ facility for the Games. This will then provide two adjacent 50m pools after the event.

A number of existing venues were also planned to be used for the Games including: Celtic park stadium (the home of Celtic football club) for the opening ceremony; Clyde auditorium (commonly known as ‘the Armadillo’) for the weightlifting; the National Football Stadium (Hampden Park) on Glasgow’s South side is to have some adaptation to raise the level of the infield to allow it to host the track and field events and the closing ceremony; Ibrox stadium (the home of Rangers football club) is to host the rugby sevens; the Kelvingrove Lawn Bowls complex in the City’s West end is to be upgraded for the bowls; the Kelvinhall International sports arena, adjacent to the bowls complex, is to be used for the boxing; Scotstoun stadium and sports centre in the City’s West end will be used for the squash and table tennis events; the Scottish Exhibition and Conference Centre (SECC) will host the judo, wrestling and some netball events, as well as hosting the media centre; Strathclyde Country Park, situated out of the City at Hamilton, will host the triathlon; and the shooting events will be held in two distant venues - Jackton, East Kilbride for the small bore contests and Barry Buddon, Angus, for the full bore and clay pigeon events. The location of the events around the City is shown in Figure 9.

Figure 9 - The location of the Games events in or near the City of Glasgow



In addition to the athletes' village and sports venues, other preparatory infrastructure works have been linked to the Games. Some of these, such as the M74 motorway extension and the East End regeneration route (a dual carriageway road running through the East of the City) were planned before the bid to host the Games was in place; whilst others, such as some of the proposed improvements to the dedicated bus lane network to the Dalmarnock area, are new.

1.9. The anticipated legacy from the 2014 Games

'Legacy' is the lasting impact of the Games on the host population. The stated central rationale for applying to host the Games in Glasgow was the potential for them to generate a positive health and social legacy for the City and nation as a whole.⁴⁴ This is not a claim unique to the 2014 Games, as the potential for health and social improvements to arise from major sports events was similarly recognised by the organisers of the 2012 Olympics and Paralympics in London, and has become the most important justification for playing host.^{45, 46}

Of all the potential legacy impacts, health improvement has been identified as the most important:

"Improving Scotland's health will be the unifying theme of our Games Legacy Plan. Health is at the heart of the legacy; the ambition is to deliver a strong and clear message that Scotland is a truly modern, healthy society - that Scotland has put itself further on the path to a healthier future".⁴⁷

It is therefore clear that the Scottish Government and Glasgow City Council wish to portray the Commonwealth Games as a public health intervention *par excellence*. This potential for significant public health impacts arises because the Games are perceived to have the potential to act simultaneously on a number of the determinants of health and able to catalyse existing policies and interventions. The expectations of the event are high, and go far beyond a simple international sports event or the provision of public entertainment:

*“Our vision is of a legacy which helps people live longer, healthier lives, in strong resilient and supportive communities, valuing and protecting the built and natural environment, with new and better skills development, employment and volunteering opportunities. A strong sporting and cultural legacy will be fundamental to achieving this vision. The award of the Commonwealth Games to Glasgow and Scotland in 2014 provides great opportunities for people of all walks of life to take pride in a strong, fair and inclusive national identity whilst making exciting connections with the 71 countries of the Commonwealth”.*⁴⁷

The vision outlined here is consistent with an understanding of the social model of health, as discussed in section 2.1 above,⁴⁸ that suggests that health is determined by a wide range of factors from an individual’s genetic inheritance all the way through the hierarchy of systems to the economic and environmental context in which people live. It is clear that the population of Glasgow, with the plethora of problems from which it suffers, is in great need of interventions that can provide a ‘step-change’ in its health outcomes. The next section will discuss what is already known about the health and social impacts of major sports events.

1.10. The impacts of major sports events

The changing nature of events

The nature of major sports events such as the Olympic Games and Commonwealth Games has evolved over the last four decades. Until the mid-1970s events were largely seen as an opportunity to provide public entertainment and to 'showcase' a city to a world audience. This rationale became increasingly unsustainable as the costs of playing host increased with the rise in the number of events in many multi-sport events (such as the Olympics), the rise in the number of athletes and officials that required to be accommodated, and the increase in standards of venues required of host cities.^{49, 50}

The trends in rising costs culminated in the massive financial loss incurred by the city of Montreal in 1976 when it hosted the Olympic Games. Following this, there was a dearth of cities willing to host events which prompted two significant changes in the nature of events. First, limits were placed on the number of events and athletes entitled to participate in events, and second, there was a commercialisation of their organisation with a large increase in the involvement of the private sector in funding and organising events.⁴⁹ The financial viability of events was also enhanced by the rapid growth in information technology, international travel and media coverage of events from the 1970s which increased the brand value of events. There was also a change in how event organisers and governments viewed events. It became more common for them to be linked into plans for regeneration and host population (legacy) benefits rather than simply city 'showcasing'.^{51, 52} The most pertinent example of this was the 1992 Olympics in Barcelona which were widely regarded as being the key factor in rebranding the City from its Fascist and industrial past into a trendy tourist destination

experiencing a renaissance of economic and cultural development.⁵³ The trend towards the use of major sports events as a lever for regeneration, development and ‘legacy’ continues today with the Glasgow bid just the latest example. However, it is the possibility for the health of the population to be improved by playing host to a major sports event that is most tantalising.

Health impacts

The health impacts of major sports events remain unclear.^{54, 55} The UK Department for Health, in preparation for 2012 Olympics in London, commissioned a review of the likely mechanisms through which an event might increase the physical activity of the host population.⁵⁶ This review suggested that there are two main mechanisms which might link events to physical activity. These are the demonstration effect (the influence athletic role models have on sports participation in the population) and the festival effect (the potential for the culture and atmosphere surrounding the event to influence physical activity). The review found some evidence to suggest that sports role models can inspire increased sports participation, but that this impact was limited to those who already participate in sport (or those who recently lapsed from participating). Furthermore, it suggested that the overall impact on participation may be neutral because those already participating may simply switch between activities rather than increase their total activity. The potential for an aversion effect was described, where non-participants are put off sport by the perceived, “unattainability and inaccessibility of elite sport and elite sports people”.⁵⁶ The review found some evidence that the festival effect had the potential to increase the likelihood of those who do not participate in significant physical activity reaching a stage where they contemplate such physical activity. However, this was

recognised to be an untested theory whose effect is likely to be limited to situations where there is strong popular support for the event, where the event is linked to local and cultural communities, and when the event is seen to be a festival that transcends a simple sports event.⁵⁶

The review focussed on the theory underlying why population physical activity might increase rather than measuring whether this had been experienced in association with previous events. Its scope was limited to physical activity and did not explore the plethora of other influences on health discussed in section 2.1.

Economic and social impacts

Of all the potential impacts of events, the most frequently evaluated have been the economic ones.⁴⁹ This is likely to be related to the need for event hosts, as part of the bidding process, to calculate the fiscal implications of the event. Using largely estimated data, several studies have concluded that hosting events has a positive economic impact through increased tourism, advertising revenues and the spin-off benefits of infrastructure construction.⁵⁷⁻⁶³

There is less known about the social impacts of major sports events, other than numerous descriptive narratives outlining the regeneration aspects of hosting events such as lists of new infrastructure.^{55, 64, 65}

1.11. The evaluation of major multi-sport sports events

Official evaluations

There is a requirement from both the International Olympic Committee (IOC) and Commonwealth Games Federation (CGF) that there is an evaluation of all events held under their jurisdiction.⁶⁶ These compulsory evaluations have in the past focused on the ability of the host to ensure that the events took place as planned with no disruption of the sport and with optimal conditions for the athletes to perform (in terms of the infrastructure, support services, accommodation etc.).

The evaluations have evolved over time to include the impacts on the host populations, as the expectations of events have evolved, and now routinely include a 'triple-bottom-line' assessment encompassing the economic, social and environmental impacts of the event.⁵⁸ These evaluations most commonly involve the use of routine statistical data rather than specially commissioned studies, with the addition of a number of process measures (such as sales data, attendance figures and spending on infrastructure).

These post-event evaluations should not be confused with the modelling exercises which are commonly undertaken as part of the bid process by candidate host cities, where there is an attempt to predict and plan for hosting the event. The modelling studies are undertaken prior to the event and therefore rely on estimated data and cannot be described as evaluations.

Evaluations performed as part of the requirements of the IOC or CFG are funded by the organising committee for the event, the host city or the host country's government, creating the potential for a conflict of interest for the funders as their

main concern may be to demonstrate success rather than expose all the actualities of the event.

Independent evaluations

Interest in the impacts of major sports events from the academic community, and special interest groups, has increased since the 1970s, leading to a rapid growth in the number of studies aiming to evaluate events, or aspects of events.^{50, 67} The rise in independent evaluations provides a counterbalance to the research funded by Games organisers, which may be subject to the biases detailed above. Part of the increase in independent evaluation has been the emergence of ‘citizen science’ - that is the work of campaigning groups in host areas to highlight (usually negative) impacts of events. Rarely does this work use traditional methods, nor have funding for substantive studies and there is also a danger of philosophical bias clouding an objective view.⁴⁴

Research designs

Most of the research available on the impacts of major sports events, for both the ‘official’ and ‘independent’ evaluations, are repeat cross-sectional surveys (i.e. routinely collected data from a random selection of the population at several points in time, sometimes termed a ‘before and after’ study if there are only two time points or an ‘interrupted time series’ if there are a large number of time points), economic impact assessments or qualitative studies. Most of these studies are also performed within two years of the event, making the assessment of any of the longer-term impacts difficult to evaluate.

Summary

It is clear that there is an existing knowledge base on the impacts of major sports events on health and the socio-economic influences on health, but that this literature is: dispersed across a wide variety of academic disciplines; hosted in a mix of grey literature (including the internet and official government publications) and peer-reviewed publications; written in a number of languages; and of varied scientific quality and validity.

It is therefore difficult to be clear what the net health or socio-economic impacts of major sports events is, or what aspects of events might influence whether such impacts are positive. One of the aims of this thesis was therefore to systematically review the existing evidence such that the impacts of previous events could be clarified.

2. Research question, aims and objectives

2.1. Overview of chapter

The literature review has highlighted that Glasgow has a significant public health problem comprising relatively high mortality, inequalities and adverse health behaviours. This problem is not new and there have been numerous attempts by Government to address the health deficit. Playing host to major sports events are increasingly justified by Government on the basis that they will create positive legacy benefits for the population. It is uncertain whether such benefits arise from events like the Commonwealth Games, and whether this will contribute to improving the health of Glaswegians.

This chapter details the research question addressed by this thesis: namely the extent to which the Commonwealth Games will contribute to the health of Glaswegians and how will can measure the impact. The chapter then goes on to detail the specific aims and objectives addressed by the thesis.

2.2. Research question

The overall research question for this thesis is: “How will the 2014 Commonwealth Games impact on Glasgow’s health, and how will we know?”

2.3. Aims

This thesis has the following aims:

1. To systematically review the impact of major multi-sport events on the health, and determinants of health, of the host populations.
2. To critique the theories espoused by the Scottish Government regarding the impact of hosting the 2014 Commonwealth Games.
3. To make evidence-informed recommendations for Glasgow City Council on how to maximise the positive health impacts, and minimise the negative health impacts, of hosting the Games.
4. To determine the most appropriate methods for evaluating the health impacts of the Games.
5. To consider whether the Games is a worthwhile health improvement intervention.

2.4. Objectives

The approach taken to achieve these aims is outlined in the following objectives:

1. To develop a systematic search strategy to capture all the evidence on the impact of major multi-sport events relevant to the 2014 Commonwealth Games.
2. To identify and develop appropriate critical appraisal tools for the available literature.
3. To select and critically appraise the evidence on the impact of major multi-sport events relevant to the 2014 Commonwealth Games.
4. To synthesise the evidence reaching an appropriate standard of quality.
5. To draw conclusions on the impact of previous major multi-sport events on host populations and the reasons for any such impacts.
6. To develop an explicit theory of change from the Scottish Government's legacy documents.
7. To critically appraise the Scottish Government's theory of change using the available evidence.
8. To design a participatory health impact assessment (HIA) of the Glasgow bid to host the 2014 Games.
9. To make evidence-informed recommendations for decision-makers that are likely to maximise any positive impacts, and minimise any negative impacts, of the Games.
10. To classify the various mechanisms through which impacts of the Games are likely to occur.

11. To consider which evaluation methods are most appropriate to obtain high quality evidence of the impacts of the Games for each type of mechanism.
12. To make recommendations for the evaluation of the 2014 Games.
13. To use the available evidence to make an informed judgement about the relative merits of the Games as a health improvement intervention.

3. Approach to the research question

3.1. Overview of chapter

This chapter discusses the methodological approach to the research question and why the particular methods were chosen. Some of the potential advantages and limitations of the chosen methods are then discussed.

The ethical issues arising from the chosen research approaches and the precautions taken are also described.

3.2. Approaches to the research question

General approach

This thesis seeks to investigate the impact of 2014 Commonwealth Games on the health of the population of Glasgow. A question such as this requires a mixed methods approach. There are several reasons for this: the timing of this thesis is in advance of the event, and so any post-event evaluation is clearly not possible; there is a requirement to both learn from previous events and then apply this learning to future events; and because of the importance of evidence, policy analysis and evaluation methods for this question.

Evidence informed policy

In the past, scientific evidence and policy-making were seen as separate domains which should operate independently of one another.⁶⁸ This may now be changing in the UK, at least in terms of the rhetoric, for two important reasons.

First, political pragmatism has grown since the 1980s as the mainstream political parties have increasingly focussed on winning the support of a narrow range of ‘swing voters’ and have consequently jettisoned ideology and policy that might interfere with this core task.^{69, 70} Without any defining ideological direction, this has arguably created the space for a more pragmatic politics based on the evidence of what works (although some maintain that, rather than there being no ideological direction for recent UK governments, there has been wholesale adoption of neoliberal ideology which is so pervasive that it is not questioned).^{33, 71} This was famously encapsulated by prime minister Tony Blair when he said, “What counts is what works”.

Second, there has been a concerted effort by many scientific researchers to advocate for the greater use of evidence in policy-making. This has been termed evidence-based policy or evidence-informed policy.^{68, 72} The basis for this is that, “good intentions and received wisdom”, are not good predictors of the effectiveness of policy interventions, and as such policies should be based instead on evidence.^{68, 73}

Difficulties with evidence-informed policy

There are difficulties with evidence-informed policy. Although we can say with some certainty, given an appropriate study design and adequate resources, what the effect of even the most complex of interventions was,⁷⁴ that does not translate into certainty about the impacts of the same intervention in the future.⁷⁵ In essence, certainty about the impacts of historical events does not create certainty about future events - even if the intervention and context are similar.

It is recognised that the impacts of interventions vary depending on the context in which they are implemented, and this context includes time, population characteristics, culture, socioeconomic backdrop and a whole range of factors that make it unique.⁷⁶ That said, much can be learnt of what works, for whom, and in what circumstances with appropriate evaluation.⁷⁶ However, unless it is possible to know which are the critical factors for a policy to have an effect, there will also be the possibility that an intervention will not reproduce the effects seen previously during the period of evaluation. This means that, “Prediction is difficult, especially of the future”.⁷⁷

Furthermore, evidence-informed policy can only be of use if an intervention has been tried previously, and if it is amenable to small-scale implementation. For example, some of the interventions being advocated to tackle climate change have never been evaluated before (e.g. contraction and convergence of carbon emissions)⁷⁸⁻⁸⁰, because the situation has never been faced previously.⁸¹ These interventions could not be trialled in a small way as they involve radical societal change. It is therefore more difficult to see how such policy proposals can be informed by evidence until after wholesale societal change has been implemented.

Fortunately, the Commonwealth Games are not a new intervention, nor do they require wholesale societal change for their implementation. This means that we can learn from previous events and then alter how the Games are implemented such that the best possible results can be realised.

Learning from past events

The literature review has already highlighted that the available evidence on the impact of major sports events is of mixed quality, dispersed throughout a variety of academic disciplines, is written in a multitude of languages and is archived in a mix of peer-reviewed journals, government documents, internet sites and the grey literature.

Traditional evidence reviews relied upon ‘an expert’ to use their knowledge of the research field to gather relevant studies and combine their results in such a way to produce an answer to the research question. The process of gathering the evidence was often ad-hoc, selective and failed to include the grey literature, foreign language papers or include studies that contradicted the reviewer’s own views.

Furthermore, the means of synthesizing this evidence was often opaque and subject to the interpretation of the reviewer.⁸²

In contrast, the systematic review is a research design which combines existing evidence in a transparent method which minimizes the biases described above. It achieves this through the use of explicit literature search strategies (including searches of the grey literature), independent screening of the identified studies by two reviewers, independent data extraction by two reviewers and an explicit method of combining the results of the available studies. Before such a combination is performed (which may involve narrative synthesis or statistical methods such as meta-analysis) there is an assessment of study quality which allows the reviewers to explore whether the inclusion of studies of varying quality influences the overall answer to the research question.⁸² In short, a systematic review is the best method available to find and synthesize the available research for a particular research question without introducing bias. For these reasons, a systematic review approach was adopted to ascertain the impact of previous major sports event on the health, and socioeconomic determinants of health, of the host population.

Understanding the legacy plan and proposed mechanisms

As discussed above, it can be problematic to make accurate predictions and generate valid evidence-informed policy because the context in which a policy intervention takes place will always be (to a greater or lesser extent) different to the context from which the research evidence is drawn. Furthermore, the intervention itself may have evolved over time.

This is certainly true of the 2014 Commonwealth Games, which will take place in the City of Glasgow. The literature review described how Glasgow is an outlier in terms of its health and social outcomes. It is therefore difficult to transfer learning from previous events, even where the intervention is very similar, because of this difference in context.

Penny Hawe and colleagues have suggested that, in terms of evaluating interventions, variety in contexts should be embraced rather than ‘controlled for’. In doing so they suggest that the *critical steps* of interventions should be identified and then evaluated instead of a more simpler outcome evaluation.⁸³ This suggests that, if the *active ingredients* or *critical steps* in an intervention can be identified, then context-independent impacts can be described and then applied to the context in question. This lends itself to a ‘theories of change’ approach, where the likely mechanisms and steps between interventions and outcomes are described in some detail alongside critical contextual factors such as culture, legal frameworks and the economy.⁸⁴

This thesis has therefore sought to understand the mechanisms (theories of change) through which the 2014 Games are proposed to act. This is an attempt to minimise problems in transferring learning from one context to another. It does this by examining the Scottish Government legacy plans and constructing a theory of change and critique.

Evidence informed recommendations

This thesis seeks to move beyond simply description of the impacts of previous events and the design of an evaluation strategy for the 2014 Games. It seeks to achieve ‘knowledge transfer’: that is the translation of scientific evidence into a

format suitable for decision-makers such that the decision-making process around the Games becomes 'evidence-informed'.⁸⁵⁻⁸⁷

Glasgow City Council has recently adopted health impact assessment (HIA) methods as a mechanism to raise the importance and profile of health outcomes in decision-making and to apply evidence to the process.^{88, 89} This is an ideal method for health professionals and researchers to take a policy proposal, discern a theory of change, apply the available evidence and then, crucially, make evidence-informed recommendations that are timely and relevant to the critical people making decisions around the relevant policy.

This thesis has therefore adopted an HIA method to apply the learning from the systematic review to the 2014 Games in Glasgow and make evidence-informed recommendations for the relevant decision-makers who are tasked with generating a positive legacy from the event.

Evaluating the Games

As will become clear, there are numerous problems with the evaluation methods adopted for previous events. There is therefore an opportunity to generate higher quality evidence from the 2014 Games. Given that this thesis will systematically review the evidence from previous events, critically appraising its quality, and then apply this learning to the Glasgow context, it would be remiss to fail to address the question of how best to evaluate the 2014 Games. The thesis therefore uses the learning about the theories of change for the event and the critical appraisal of previous evaluations, to develop an evaluation framework for the 2014 event.

The Games as a health improvement intervention

Barring an unexpected and radical turn of events, the 2014 Games will be held in the City of Glasgow. There is little point in this thesis considering the question of whether or not the City should have bid for the Games. However, the Games can still be framed in different ways: as a festival; as a regeneration initiative; as a method of generating inward investment; as an international sports event; or as a health improvement intervention. The framing of the Games, the design and implementation of the event and policies around the event, and the resources used in hosting them are all amenable to change. This last section of the thesis will utilise the learning accumulated throughout to draw conclusions on the nature and utility of the Games as a health improvement intervention. This will synthesise learning from previous events, the critique of the Government's theory and the HIA.

3.3. Ethics

Ethical research

The ethical issues arising during the research related to competing interests, collaborations and data collection.

Competing interests

This thesis examines the impacts of major sports events on the health and determinants of health of the host population, and makes a series of policy critiques and recommendations. Aspects of this thesis, including the systematic review and health impact assessment have been offered for publication in the peer reviewed literature and the HIA has been fed into the policymaking process. There is therefore potential for this work to influence the civic and political debate and it is also therefore important that any competing interests that I might have be transparent. I am a member of a political party (Scottish Socialist Party) and I believe that it is important that this information be made available to those reading this work such that they can make an informed judgement as to whether or not the work is based on opinion or evidence. I have therefore declared this interest in each of the peer-reviewed papers submitted for publication arising from this thesis.

Collaborators

The systematic review and health impact assessment sections of this work were undertaken in collaboration with a number of others. Their contributions are detailed in the acknowledgements section in accordance with ethical research practice.

Methods of data collection

There can be ethical issues that arise when data is gathered from individuals (and who may therefore be inconvenienced or harmed in some way by this), or where existing data is used in such a way that it causes harm (e.g. breaching confidentiality). The potential for harm to arise from data collection is normally monitored by an ethics committee prior to any potentially harmful data collection for the purpose of research being undertaken. No formal ethics approval was sought for any section of this thesis. The data collection involved in each section, and the reason why no ethics approval was sought, is given below.

The systematic review involved searching for, critically appraising, and synthesising existing publications relating to the impact of major sports events. There was no use of primary data nor was there any potential for the use of this secondary data to cause harm to individuals. This section of the thesis did not therefore require any ethics approval.

The critique of the Scottish Government's legacy plan of the thesis involved an analysis of the Scottish Government's legacy plan such that a theory of change could be ascertained and then critiqued. It did not involve any primary data collection and did not therefore require any ethics approval.

The health impact assessment was performed in collaboration with Glasgow City Council. It forms part of their policy-making process and did involve three substantive methods of primary data collection:

- Additional questions were added to the biannual Glasgow Household Survey which is used by the council for service planning

- The 'Have Your Say' questionnaire was distributed in paper and electronic format to gather the views of City residents for analysis as part of the HIA
- A series of 'Have Your Say' events were organised to gather and verify the views of different communities as part of the HIA

Each of these data collection exercises were viewed by the City Council as part of their routine consultation with residents about policy decisions. I had input into the design of these data collection methods and in the analysis of the data, however the data remains the property of the City council. No ethics approval was sought for the health impact assessment on the basis that it formed part of the democratic consultation processes of the City council.

The last section of the thesis, involving the development of an evaluation framework for the 2014 Games, did not involve any primary data collection and did not therefore required ethics approval.

4. Systematic review

4.1. Overview of chapter

This chapter describes the systematic review undertaken to synthesise the learning relating to the impact previous events had on the health of the host population and the determinants of health for the host population. The methods and results are described in detail. These results are used in the subsequent chapters to inform the critique of the Scottish Government's theory of how the Games will generate impacts, the Health Impact Assessment, the approach to evaluating the Games and the synthesis.

4.2. Systematic review method

A brief online protocol was published in March 2008.⁹⁰

Data sources and searches

The following databases were searched from 1978 during February and March 2008: ASSIA (Applied Social Science Index and Abstracts), BHI (British Humanities Index), Cochrane database of systematic reviews, Econlit, EMBASE, ERIC, HMIC, IBSS, MEDLINE/Pre-MEDLINE, PsycINFO, Sociological Abstracts, Sportdiscus, Web of Knowledge and Worldwide Political Science Abstracts without language restrictions.

An extensive grey literature search was conducted between April 2008 and October 2008 using the following gateways: BUBL, CEBE (Centre for Education in the Built Environment), CHI (Chartered Institute of Housing), COPAC, ESRC society today, Google, IDOX, Index to Theses, HUD (US Department of Housing and Urban Development), INTUTE, Proquest Dissertations and Theses, Royal Town Planning Institute, Sapling Info, SCIRUS, SIGLE, TRIS (Transportation Research Information Service), Urban Age and WorldCat. There was no restriction on the publication date or language. The search terms are detailed in appendix 1. The references and bibliographies of all the included references and reviews were hand-searched. A request for relevant studies was distributed using UK and international email lists for health impact assessments and the International Society for Urban Health newsletter.

Study inclusion criteria

Included were studies of any design which had investigated the impact on the host population of any 'one-off', international, multi-sport event, focussed on a single city or area, occurring between January 1978 and January 2008. Studies relating to earlier events were not included because of the increasing focus by host cities on the potential for legacy, rather than using major events primarily as an opportunity for national showcasing, after 1978.⁵² Outcomes relating to any measure of health, illness, well-being, quality of life, or of any of the determinants of health as described by Dahlgren and Whitehead,¹⁰ were included. Studies exclusively investigating: the impacts on visitors, athletes or spectators; host population support for the event; non-host population's opinions about the host area; media portrayals of the event; and economic impacts using exclusively estimated data were excluded (studies utilising a mix of real and estimated data were included). Commentaries which did not present original data or analysis were not included in the review. Simple lists of construction activity related to events (e.g. new stadia) were not included, although studies describing the impact of construction on any of the determinants of health were (e.g. access to facilities or economic growth).

Study selection, assessment of study quality & data extraction

Two reviewers independently screened all references identified by the searches before de-duplication. Identified studies that were potentially relevant were then retrieved where possible and independently screened for relevance. All retrieved studies were critically appraised independently by two reviewers. Disagreements were resolved by discussion between reviewers. The quality of all the included studies was assessed using a modified version of the Hamilton quality assessment tool (Appendix 2).⁹¹ Economic impact assessment models were appraised with additional questions based on expert advice, as no critical appraisal framework for

them could be identified (Appendix 3). Some of the economic studies used only real time data rather than a mix of real time and estimated data. Variations in data characteristics were part of the critical appraisal tool, but were not reflected adequately in the overall grading, and so an indication of the studies which used only real time data is provided in the synthesis and in Table 2. An additional set of appraisal questions was used for qualitative studies based on the approach outlined by Dixon-Woods (Appendix 4).⁹² The critical appraisal criteria were used to indicate the level of evidence reported in each quantitative study (ranging from 1++ for the highest quality to 4 for expert opinion) based on a modified Health Development Agency guideline.⁹³ The assignment of each level was based on the design of the studies in combination with the risk of confounding, bias or chance influencing the results derived from the critical appraisal. Those studies meeting all the critical appraisal criteria were classified as 'high quality' and those meeting a majority of criteria and with a low risk of selection bias (criterion 2) as 'well-conducted' (Appendix 5).

Synthesis

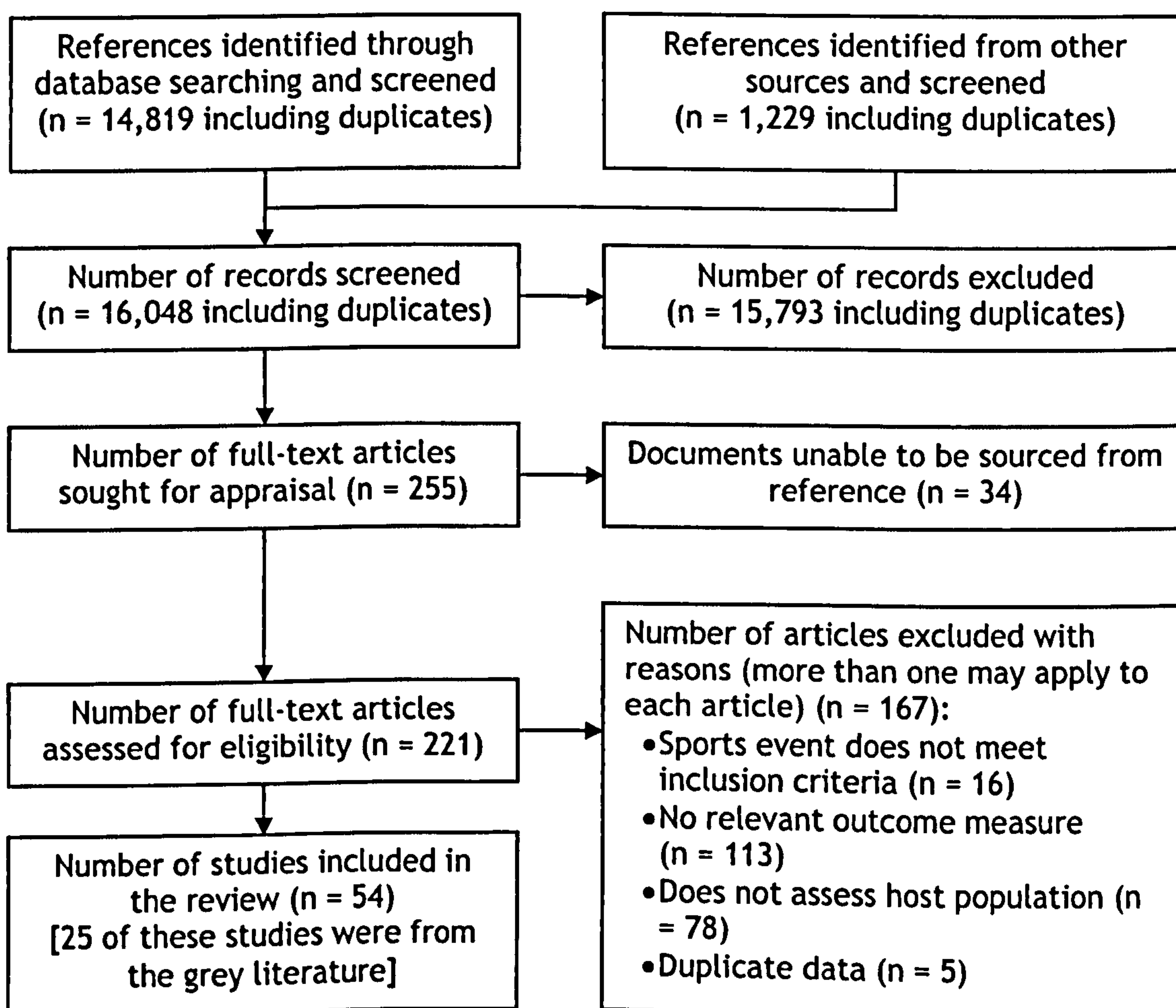
The data were tabulated with an indication of study quality and grouped into nine broad categories: health; recreation; transport and environment; crime, housing and demography; volunteers; culture; economics; business; and tourism (Tables 1 & 2). Where there were multiple studies with similar outcome measures the data were synthesised narratively using ESRC guidelines.⁹⁴ This was possible for some outcomes relating to economic growth, employment, tourism and transport and, where there were studies of varying quality, greater emphasis was put on the results of the better quality studies. A range of other diverse outcomes were reported which were not amenable to synthesis; these outcomes have been

summarised narratively. The available data were not amenable to formal testing for bias across studies.

4.3. Systematic review results

Fifty-four studies met the review criteria and were included (Figure 10); 34 potentially relevant studies were unobtainable (Appendix 6); and 25 of the total were obtained from the grey literature. The quality of the included studies was low and characterised by a high risk of bias. No systematic reviews were identified and the level of evidence of the included individual quantitative studies was either 2+ (n= 7) or 2- (n= 41). Three of the studies from the grey literature were 2+ and three were qualitative. Where a 2+ study is reported this is indicated in parentheses. A summary of the reported impacts is presented in Tables 1 and 2 (with more detailed data available appendix 7).

Figure 10 - Results of the literature search



Health

One study included assessment of a direct health impact. It used a multivariate model to analyse the trends in suicide rates in Seoul during the 1988 Olympics. It reported no change in the suicide rate (Level 2+).⁹⁵

During the 2002 Asian Games in Busan, cars were restricted from entering the city on certain days using car registration plate numbers as a rationing tool. One study (Level 2+) reported that paediatric admissions to hospital declined in the three weeks after the Busan event compared to the Games period and three weeks before the Games (RR 0.73, 95% CI 0.49-1.11) in contrast to the following year which had an increase in admissions (comparing the three week period after the event one year on with the Games period and three weeks before the Games one year on) (RR 1.78, 95% CI 1.27-2.48).⁹⁶ A study reporting a similar outcome in Atlanta at the time of the 1996 Olympics compared paediatric hospital admissions for asthma during the Games period with the four weeks before and four weeks after the Games. It reported decreases in these admissions using a variety of markers of health service use: Medicaid claims (RR 0.61, 95% CI 0.44-0.85), health maintenance organisation (US healthcare provider) claims (RR 0.56, 95% CI 0.31-1.02), data from two paediatric hospitals (decreased by 11.1%) and in the Georgia hospital discharge database (decreased by 19.1%). This reported decrease in paediatric asthma admissions in Atlanta was associated with a 22.5% decrease in peak traffic counts ($p < 0.001$) and a 27.9% decrease in peak ozone levels ($p < 0.001$) in the city.⁹⁷

One study reported that 263 children from outside the local catchment area were seen at Atlanta hospitals around the time of the 1996 Olympics (13th July to 13th August). The mean age was 6.7 years and 24% were seen in tertiary care centres and 76% in urgent care centres. The children originated from 23 countries with 15 primary languages. A greater proportion of these 263 children required admission compared to local children during the event (27% vs 13% respectively at the tertiary hospital and 7% vs 3% at the country hospital), and 44% were uninsured.⁹⁸

A repeat cross-sectional study of presentations to hospital with illicit drug-induced problems comparing the days of Olympic Games in Sydney in 2000 with the two weeks beforehand reported an increase in the mean daily number of presentations of 4.5 (from 8.8 to 13.3, $p=0.04$). Presentations peaked 24 hours after the closing ceremony (at 35.0 per day) and were higher at weekends (mean 16.6 compared to a mean of 9.2 during the week, $p=0.001$). Presentations of ecstasy- and amphetamine-related problems increased (daily mean of 5.1 compared with 1.7, $p=0.007$) but heroin-related problems were unchanged (daily mean of 4.5 compared with 4.2, $p=0.8$). Australian residents comprised 90% of the presentations.⁹⁹

Recreation

One study reported that overall sports participation (4 or more times in the last 4 weeks, except walking) decreased in the Manchester area by 2% following the Commonwealth Games and that the gap in participation rates between those in affluent and deprived areas widened significantly.¹⁰⁰ There was an upward trend in sports participation from the early 1980s until 1994 in association with the 1992 Olympics in Barcelona.¹⁰¹ A study examining the Manchester event suggested that it was difficult to reap sports legacy gains because of problems with funding, capacity, exclusion of voluntary groups from using the event branding and because

of a failure to retain key staff after the Games. It was also suggested that the provision of new sports facilities benefited elite athletes more than the host population.¹⁰² However, satisfaction with greenspace in Manchester did increase (from 28% to 75%) following the event.¹⁰³

Economic impacts

The outcomes most commonly assessed were economic growth and employment. Although most studies associated events with increased economic growth and employment these were often based largely on estimated data, had a very short post-event data collection period and failed to take account of the opportunity costs, limiting the validity of the overall results (even in the best quality studies).¹⁰³⁻¹¹⁵ Indeed some of the studies with longer data collection periods, less estimated data and more collected data described some negative growth and employment impacts.^{111, 116, 117} Inflation increased in Barcelona^{110, 118} and Atlanta¹¹⁰ but not Sydney^{51, 110} in the run-up to their events. Investment in sports infrastructure in Sydney was associated with a delay in health and education capital investment.¹¹⁹

Two studies reported that becoming a host city was associated with higher investment as approximated by stock market indices.^{120, 121} Two qualitative studies found that business development activity generated better networking and market access in regions that focused on the development of a long-term business network instead of short-term benefits from attracting visitors during the Sydney Olympics.^{122, 123} Business was perceived to have benefited from the Calgary event¹²⁴ and from business assistance offered during the Games in Manchester.¹¹⁴

Transport and the environment

Studies from five cities (Atlanta,^{97, 125} Busan,^{96, 126} Los Angeles,¹²⁷ Seattle¹²⁸ and Sydney¹²⁹) examined the impact of transport mitigation strategies put in place during events (including restrictions on car use, increased public transport availability, promotion of car sharing and increased working hours flexibility). A fall in air pollution was reported in two cities: Atlanta⁹⁷ and Busan (Level 2+).⁹⁶ A further lower quality study in Busan reported an increase in pollution.¹²⁶ Road traffic volume decreased during at least two events^{97, 125, 126, 128} as did car journey time in Los Angeles and Sydney.^{127, 129} A small study (n=12 households) reported increased aircraft noise and night-time awakenings among residents living close to the airports at Atlanta around the time of the Olympics.¹³⁰

Impacts on volunteers

Three studies examined the impacts on event volunteers. They reported that volunteers in Manchester: had a mix of positive and negative experiences;¹³¹ no change in their desire to volunteer in the future;^{131, 132} and no increase in their sports participation.^{131, 132} However, one study did find that volunteers in Lillehammer and Sydney perceived an increase in their skills following volunteering.¹³³

Other impacts

Demand for police services in Atlanta increased and recorded crime decreased during the 1996 Olympics (Level 2+).¹³⁴ Reported vandalism decreased after the 2002 Commonwealth Games in Manchester whilst satisfaction with the local area, housing and supermarket access increased.¹⁰³ There was consistent evidence from four Olympic cities (Barcelona, Atlanta, Sydney and Athens) that house prices rose in host cities in comparison to other areas of the host country.^{110, 118, 135}

There was a suggestion that the Calgary Games were associated with depopulation in the immediate area next to the Games venues,¹³⁶ but another study reported increased migration to the wider host area for all North American Olympic events.¹¹¹ In Atlanta, at the time of the Olympics, a new 'urban camping' law was reported to have been used to move homeless people away from the Games environs.¹³⁷

A study of the Sydney Olympics reported data suggesting hosting the Games was associated with centralisation of decision-making and a loss of local democracy,¹³⁸ although another study described enhanced community spirit and national pride following the Games.¹³⁹

Host resident values were found not to have changed following the Lillehammer event.¹⁴⁰ There was a reported decline in Catalan identification in contrast to increasing regional identification in other Spanish regions following the Barcelona Olympics.¹⁴¹

The number of tourists visiting Lillehammer,^{142, 143} Atlanta,¹¹⁰ Seoul¹⁴⁴ and Barcelona¹¹⁸ increased whilst the number visiting Calgary was largely unchanged,¹⁴³ and the number visiting Manchester decreased.¹⁴⁵ The impact on tourist visits to Sydney were mixed.^{117, 146} Hotel occupancy rates decreased in Barcelona¹¹⁸ and increased in Atlanta.¹⁴⁷

Table 1 – Impacts on health and determinants of health

	Study	Level of Evidence ^a	Event ^b	Outcome	Impact ^c
Health	Lee ⁹⁶	2+	2002 AG Busan	Childhood asthma hospital admissions	↔
	Shin ⁹⁵	2+	1988 OG Seoul	Suicide rates	↔
	Friedman ⁹⁷	2-	1996 OG Atlanta	Childhood asthma hospital presentations	↓
	Indig ⁹⁹	2-	2000 OG Sydney	Hospital illicit drug-related presentations	↑
	Simon ⁹⁸	2-	1996 OG Atlanta	Paediatric health service demand	↑
Recreation	Brown ¹⁰²	Qualitative	2002 CG Manchester	Legacy programme implementation	N/A
	MORI ¹⁰⁰	2-	2002 CG Manchester	Sports participation	↓
				Sports participation inequality	↑
	Truno ¹⁰¹	2-	1992 OG Barcelona	Sports participation	↑
Newby ¹⁰³	2-	2002 CG Manchester	Satisfaction with green spaces	↑	
Transport & environment	Lee ⁹⁶	2+	2002 AG Busan	Air pollution	↓
	Potter ¹²⁵	2+	1996 OG Atlanta	Road traffic volume	↓
	Fidell ¹³⁰	2-	1996 OG Atlanta	Airport noise episodes	↑
				Night time awakenings	↑
	Friedman ⁹⁷	2-	1996 OG Atlanta	Air pollution	↓
				Road traffic volume	↓
	Giuliano ¹²⁷	2-	1984 OG Los Angeles	Car commuting journey time	↓
	Hallenbeck ¹²⁸	2-	1990 GWG Seattle	Road traffic volume	↔
Hensher ¹²⁹	2-	2000 OG Sydney	Commuting journey time	↓	
Lee ¹²⁶	2-	2002 AG Busan	Air pollution	↑	
			Road traffic volume	↓	
Crime, housing & demography	Decker ¹³⁴	2+	1996 OG Atlanta	Demand for police services	↑
				Recorded crime	↓
	Brunet ¹¹⁸	2-	1992 OG Barcelona	House prices	↑
	HBOS ¹³⁵	2-	1992-2004 OG	House prices	↑
	Hiller ¹³⁶	2-	1998 WO Calgary	Population of immediate host area	↓
	Hopkins ¹³⁷	2-	1996 OG Atlanta	'Urban camping law' introduction	N/A
	LERI ¹¹⁰	2-	1992-2004 OG	House prices	↑
	Newby ¹⁰³	2-	2002 CG Manchester	Perceived supermarket access	↑
Satisfaction with local area				↑	
Satisfaction with house and its condition				↑	
Reported vandalism to own property				↓	
Lybbert ¹¹¹	2-	1980, 1988 WO & 1984, 1996 OG	Migration to Olympic regions	↑	
Volunteers	Downward ¹³²	2-	2002 CG Manchester	Sports participation of event volunteers	↔
				Likelihood of event volunteers volunteering after event	↔
	Kemp ¹³³	2-	1994 WO Lillehammer & 2000 OG Sydney	Perceived skills development	↑
	Lumsdon ¹³¹	Qualitative	2002 CG Manchester	Experience of event volunteers	↑↓
				Volunteers' participation in sport	↔
Volunteers' participation in further voluntary work				↔	
Culture	Hargreaves ¹⁴¹	2-	1992 OG Barcelona	Catalan identity	↓
	Kolstad ¹⁴⁰	2-	1994 WO Lillehammer	Adoption of Olympic values	↔
	Waite ¹³⁹	2-	2000 OG Sydney	Community spirit	↑
				Pride	↑
Owen ¹³⁸	Qualitative	2000 OG Sydney	Local democracy	↓	

^a Level of evidence as per appendix 5

^b AG = Asian Games; CG = Commonwealth Games; GWG = Goodwill Games; OG = Olympic Games; WO = Winter Olympic Games.

^c ↑ = increase; ↓ = decrease; ↔ = no change; ↑↓ = mixed impacts for this outcome; N/A = not applicable (i.e. cannot be described as a simple increase or decrease).

Table 2 - Impacts of major events on the economic determinants of health

	Study	Level of Evidence ^a	Event ^b	Outcome	Impact ^c
(Un)employment	Kasimati ¹⁰⁵	2+	2004 OG Athens	Unemployment	↓
	KPMG ¹⁰⁶	2+	2006 CG Melbourne	Unemployment	↓
	*Baade ¹¹⁶	2-	1984 OG Los Angeles & 1996 OG Atlanta	Employment	↑↓
	Brunet ¹¹⁸	2-	1992 OG Barcelona	Unemployment	↓
	*Giesecke ¹¹⁷	2-	2000 OG Sydney	Employment	↔
	Hotchkiss ¹⁰⁸	2-	1996 OG Atlanta	Employment	↑
	ISER ¹⁰⁴	2-	2001 SWOG Anchorage	Employment	↑
	Kim ¹⁰⁹	2-	1988 OG Seoul	Employment	↑
	*Lybbert ¹¹¹	2-	1980, 1988 WO & 1984, 1996 OG	Employment	↑
	Newby ¹⁰³	2-	2002 CG Manchester	Unemployment	↓
	Smith ¹¹⁴	Qualitative	2002 CG Manchester	Employment	↑
Tucker ¹¹³	2-	1984 - 2004 OG	Employment	↑	
Economic growth	Kasimati ¹⁰⁵	2+	2004 OG Athens	Economic growth	↑
	KPMG ¹⁰⁶	2+	2006 CG Melbourne	Economic growth	↑
	ERA ¹⁰⁷	2-	1984 OG Los Angeles	Economic growth	↑
	Giesecke ¹¹⁷	2-	2000 OG Sydney	Economic growth	↓
	ISER ¹⁰⁴	2-	2001 SWOG Anchorage	Economic growth	↑
	Kim ¹⁰⁹	2-	1988 OG Seoul	Economic growth	↑
	LERI ¹¹⁰	2-	1992-2004 OG	Economic growth and fixed capital formation	↑
	*Lybbert ¹¹¹	2-	1980, 1988 WO & 1984, 1996 OG	Economic growth	↑↓
	Pitts ¹¹²	2-	1998 GG Amsterdam	Economic growth	↑
	Sterken ¹¹⁵	2-	1984 - 1996 OG	Economic growth	↔
	Other economic	Brunet ¹¹⁸	2-	1992 OG Barcelona	Inflation
LERI ¹¹⁰		2-	1992-2004 OG	Income	↑↓
				Inflation	↑↓
Newby ¹⁰³		2-	2002 CG Manchester	Net income	↑
				Financial difficulty	↓
Preuss ⁵¹		2-	2000 OG Sydney	Inflation	↔
Searle ¹¹⁹	2-	2000 OG Sydney	Health & education spending	↓	
			Recreation spending	↑	
Business	Berman ¹²¹	2-	2000 OG Sydney	Stock market value	↑
	Mount ¹²⁴	2-	1988 WO Calgary	Perceived benefits for business	↑
	O'Brien ¹²³	Qualitative	2000 OG Sydney	Development of a business network	N/A
	O'Brien ¹²²	Qualitative	2000 OG Sydney	Business network strategies	N/A
	Smith ¹¹⁴	Qualitative	2002 CG Manchester	Business assistance	↑
	Veraros ¹²⁰	2-	2004 OG Athens	Stock market value	↑
Tourism	Athanasopoulos ¹⁴⁶	2+	2000 OG Sydney	Domestic tourist visits	↔
				Domestic business travel	↑
	Brunet ¹¹⁸	2-	1992 OG Barcelona	Tourist overnight stays	↑
				Hotel occupancy	↓
	Faber Maunsell ¹⁴⁵	2-	2002 CG Manchester	Tourist trips (UK and international tourists)	↑↓
	Giesecke ¹¹⁷	2-	2000 OG Sydney	Tourist spending	↑↓
	Kang ¹⁴⁴	2-	1988 OG Seoul	Share of South East Asian tourist market	↑
	LERI ¹¹⁰	2-	1992-2000 OG	Tourist visitors	↑
			1996 OG Atlanta	Number of conventions	↑
			1996 OG Atlanta	Hotel occupancy	↑
	Spilling ¹⁴²	2-	1994 WO Lillehammer	Overnight visitors	↑
State of Utah Governor's office ¹⁴⁷	2-	1988 WO Calgary	Tourist visits	↓	
		1996 OG Atlanta	Tourism revenue	↑	
Teigland ¹⁴³	2-	1988 - 1994 WO	Hotel occupancy	↑	
			Tourist visits	↑↓	

^a Level of evidence as per appendix 5

^b AG = Asian Games; CG = Commonwealth Games; GG = Gay Games; GWG = Goodwill Games; OG = Olympic Games; SWO = Special Winter Olympic Games; WO = Winter Olympic Games.

^c ↑ = increase; ↓ = decrease; ↔ = no change; ↑↓ = mixed impacts for this outcome; N/A = not applicable (i.e. cannot be described as a simple increase or decrease).

* These economic studies did not use any estimated data

5. Critique of the Scottish Government's legacy plan

5.1. Overview of chapter

This chapter builds upon the systematic review detailed in Chapter 5 by critiquing the Scottish Government's legacy plan using the evidence synthesised in the review and other evidence identified in Chapter 2.

The Government's consultation document on the legacy is used to create a theory of change based on the Government's thinking, and the key mechanisms for generating impacts are detailed.

The mechanisms of impact are then classified into three types: direct impacts, catalytic effects and project effects. This classification is then used in later chapters to consider the best evaluation methods and the likelihood of impacts being realised.

5.2. Critique method

This section of the thesis describes the Scottish Government's initial policy documentation of how the Games will generate impacts; generates a 'theory of change' to allow this theory to be critically appraised; and then ascertains the evidence for this theory using the available evidence from previous events.

Policy documentation

The Scottish Government documentation explaining how it expects the 2014 Games to impact on the host population was published three months after Glasgow won the right to host the event (published with the title 'On Your Marks').⁴⁷ This outlined an array of mechanisms (i.e. the interconnecting processes and intermediate steps between the intervention and outcomes) and outcomes that were expected across all of the areas of Scottish Government departmental responsibility. This publication was followed by a public consultation and then the first of a series of annual legacy action plans.¹⁴⁸ 'On Your Marks' was utilised to create the theory of change and critique because it best exposed the underlying thinking for the Scottish Government's legacy plan.¹⁴⁹

Ascertainment of the theory of change

'On Your Marks' lays out in tabular form the means by which Games-related activities are proposed to generate 'legacy' outcomes, according to each of the Governmental themes (Healthier, Smarter, Safer and Stronger, Wealthier and Greener). These were then transformed into the format of a linear logic model to expose the underlying thinking behind each impact.

Application of evidence to the theory

Each of the mechanisms and outcomes were then cross-referenced with the existing evidence base. This allowed those mechanisms and outcomes for which there was existing evidence to be compared with previous events and the validity of them to be critically appraised.

5.3. The Scottish Government's theoretical framework

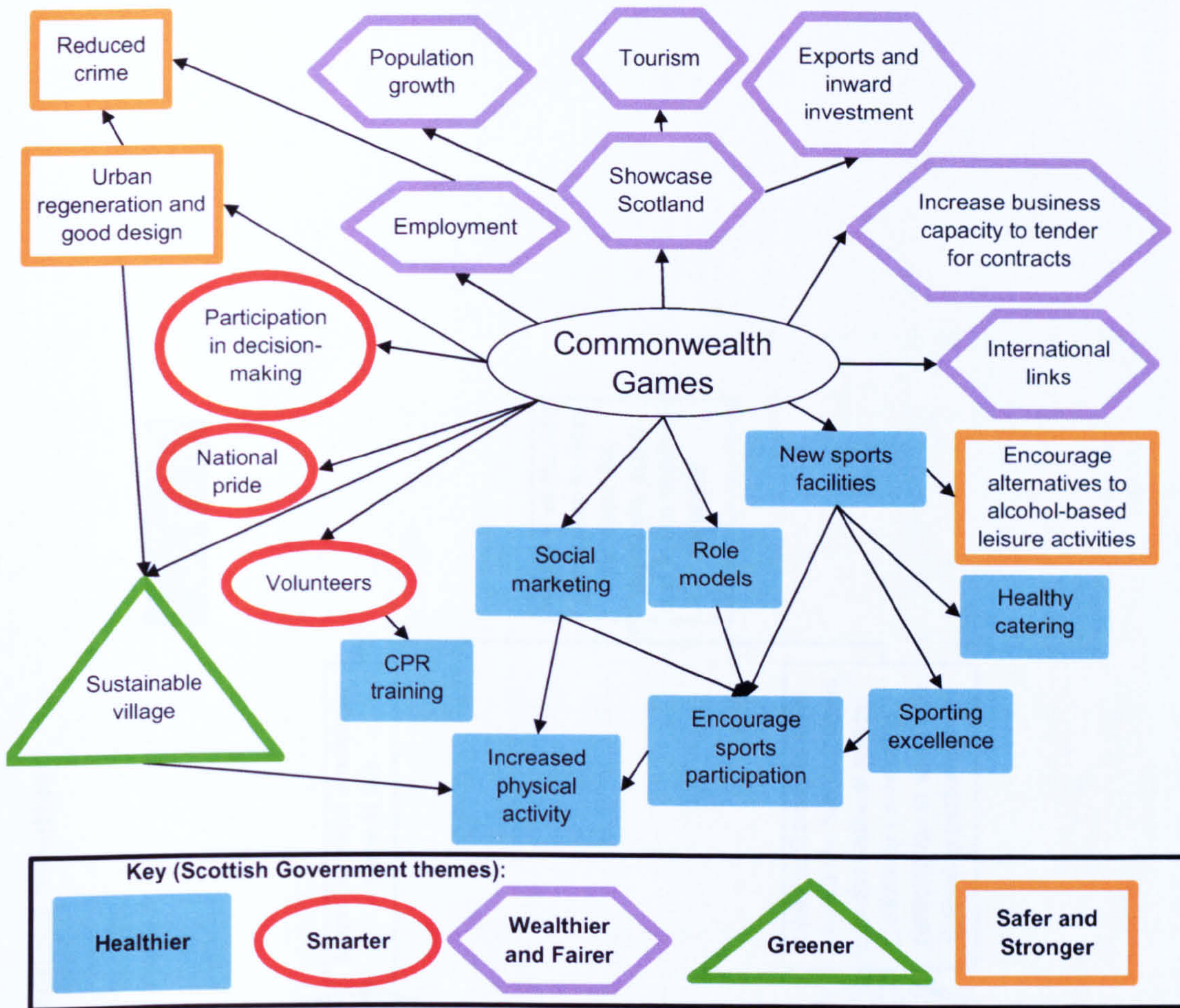
'On Your Marks' suggested impacts across the Scottish Government's themes (Healthier, Wealthier and Fairer, Smarter, Safer and Stronger, and Greener).

How might the Games create impacts?

This Government theory of the mechanisms through which health and social change were proposed to be generated, were detailed in 'On Your Marks' in tabular form.⁴⁷

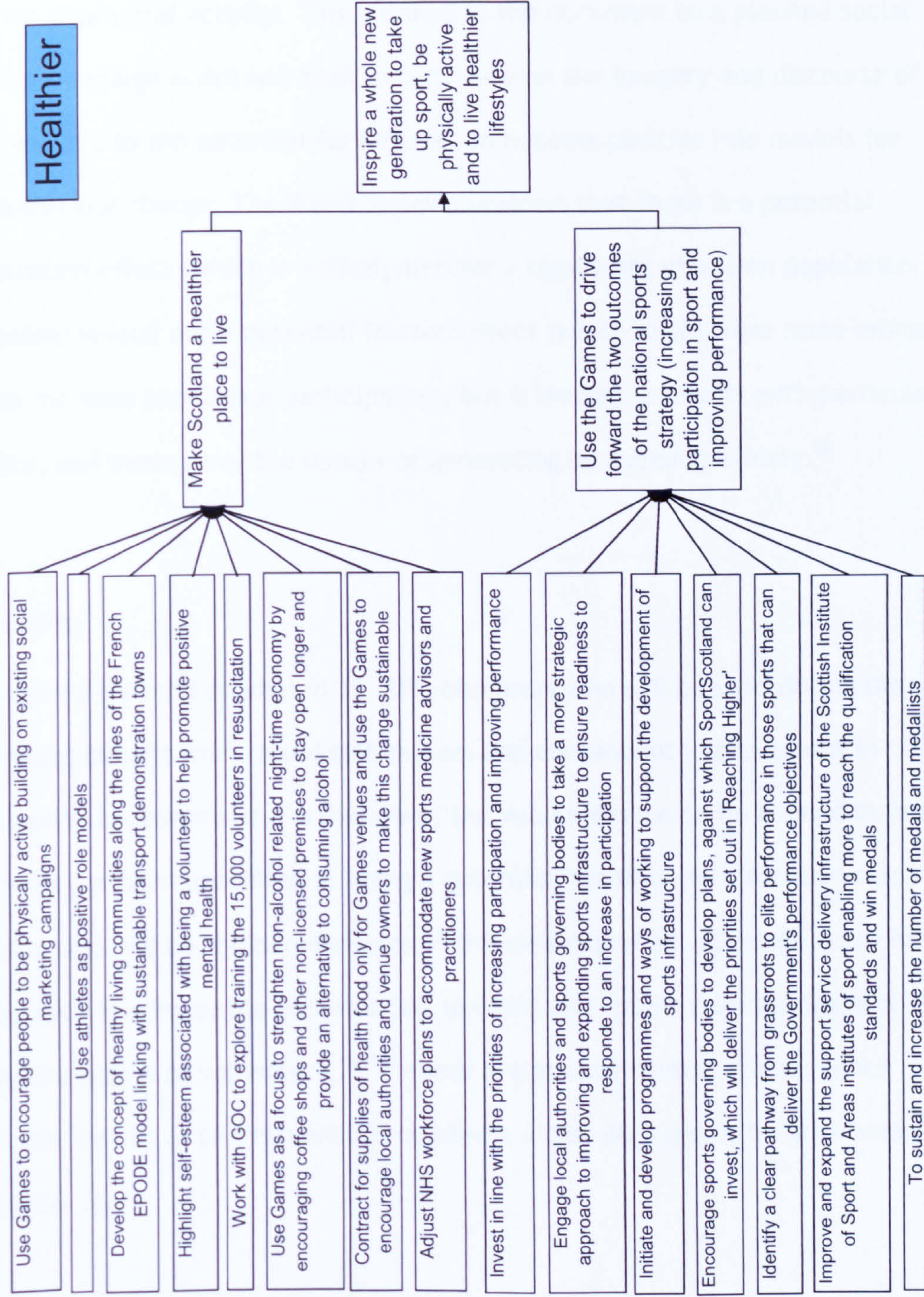
Drawing on the details from the Government's document I created a diagrammatic summary of the main mechanisms it proposes (Figure 11).

Figure 11 - A theory of change for the determinants of health



For each of the Scottish Government themes, a variety of possible mechanisms through which health and social change could occur were suggested in the tables contained within the consultation document.⁴⁷ I used these tables to create diagrammatic summaries of the Government's theories of change. The theory relating to health outcomes is shown in Figure 12.

Figure 12 - The mechanisms through which the Games might make Scotland 'Healthier'



This theory suggests that health will be improved through a variety of mechanisms (extracted from the Scottish Government's document), each of which considered below:

Inspiration effect

The Games are described as having the ability to inspire the population to increase their level of physical activity. This is linked in the document to a planned social marketing campaign which will seek to capitalise on the imagery and discourse of the Games, and to the potential for athletes to become positive role models for health behaviour change. The Weed review considers that there is a potential demonstration effect (which is unlikely to have a significant effect on population participation levels) and a potential festival effect (which might have some limited ability to increase population participation, but is limited to events with particular resonance, and these carry the danger of generating an aversion effect).⁵⁶

Volunteering

It is perceived that the estimated 15,000 volunteers who will be used during the Games might benefit from raised self-esteem and consequent improvement in mental health improvement. Furthermore, the volunteers would be trained in first-aid and this has been described as being a potential health benefit for the wider population who will be the beneficiaries of this new expertise. Although there has been research looking at the experiences, learning and future volunteering and participation habits of volunteers,¹⁵⁰⁻¹⁵² there are no quantitative studies which consider the health or self-esteem of volunteers either during or after such events (see Chapter 3).

Sports facilities

The plan for the Games includes the construction of new sports facilities including a new indoor cycling velodrome, an indoor sports arena (principally for use as a badminton venue), a new hockey venue and the addition of a 50m 'warm-up' swimming pool to an existing 50m pool. These are all to be constructed in the East End of Glasgow. A mountain biking circuit is to be built at the Southern Edge of Glasgow on the Cathkin Braes. The full compliment of facilities required for hosting the Commonwealth Games is to be provided by the adaptation and upgrade of existing facilities such as the National Football Stadium at Hampden (for the athletics), Tollcross swimming pool, Celtic Park (for the opening ceremony), Ibrox Stadium (for the rugby) and Strathclyde Park (for watersports). The Government's theory of change suggests that the construction and upgrade of sports facilities will encourage additional sports participation in the population, and that this additional participation will have health benefits. The evidence for this mechanism of health improvement for the population is limited. In Manchester the provision of new facilities was reported to have benefited elite athletes more than the local population following the construction of new facilities for the 2002 Commonwealth Games.¹⁰² Even if the construction of new facilities were effective in generating an increase in physical activity, this may have a limited effect in Glasgow because of the small number of new facilities being constructed. The new mountain bike circuit, hockey facility, velodrome, swimming pool and indoor sports arena could provoke this impact in Glasgow, although the potential for the swimming pool to generate new users is likely to be limited by its position next to the existing 50m facility.

Food provision

The catering provision within the Games venues is identified as a mechanism for health improvement. Clearly this is an opportunity to impact on the dietary habits of those using the facilities as participants, spectators and employees. Although it does not simply follow that a change in catering will generate a change in dietary intake (and health), there is a clear opportunity for this to occur. Such changes in the catering arrangements in the existing facilities could occur independently of the Games.

Social determinants of health

'On Your Marks' does not detail the health impacts of changes in the wider social and economic spheres, although these links are explicit in the Government's health improvement plans.¹⁵³ The impact of the Games on the wider determinants of health are discussed in more detail in the section on the HIA. The tabulated theories in the Government's consultation document for the other themes have been summarised diagrammatically in Figures 13-16.

Figure 13 - The mechanisms through which the Games might make Scotland 'Wealthier and Fairer'

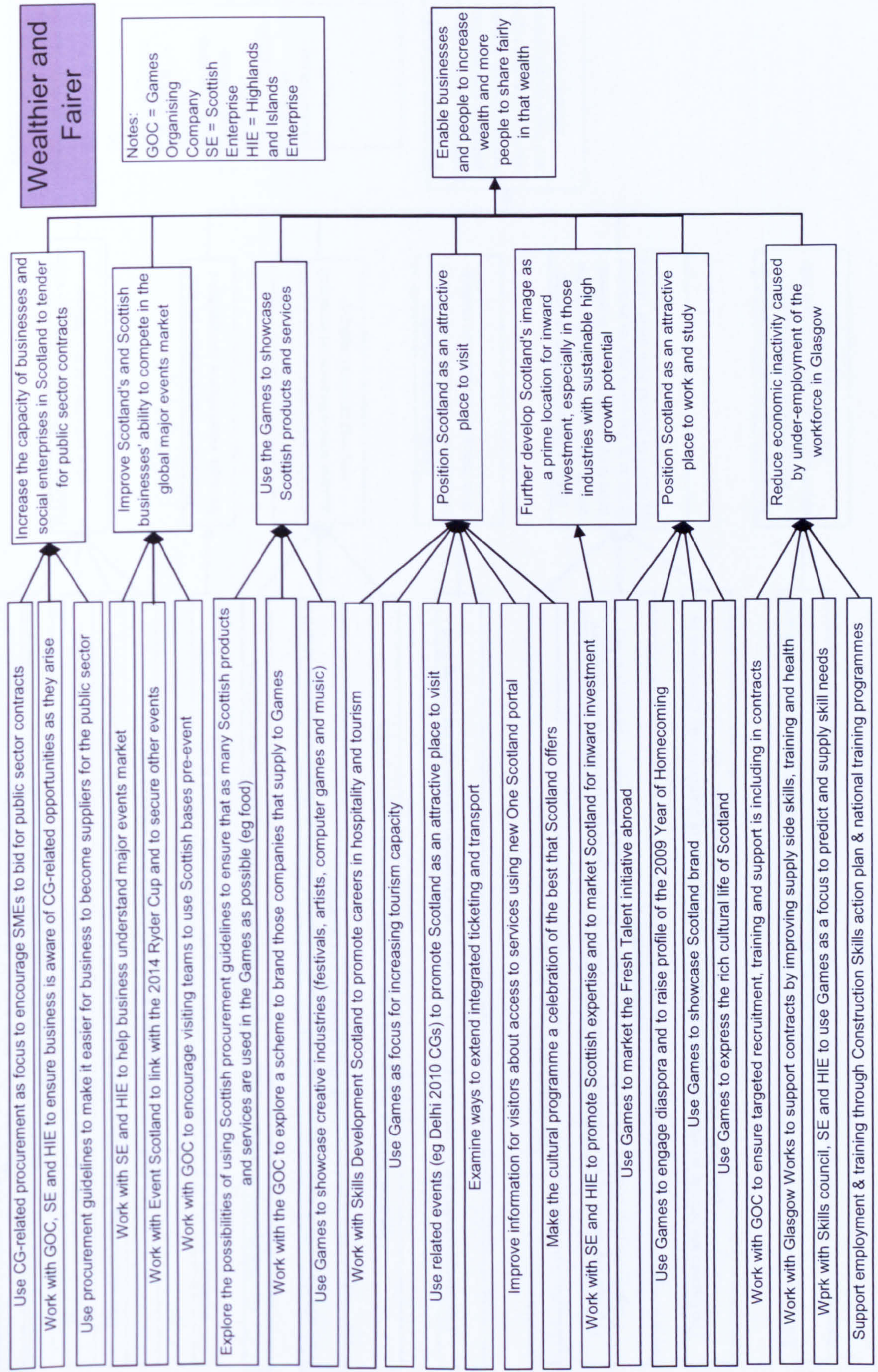


Figure 14 - The mechanisms through which the Games might make Scotland 'Smarter'

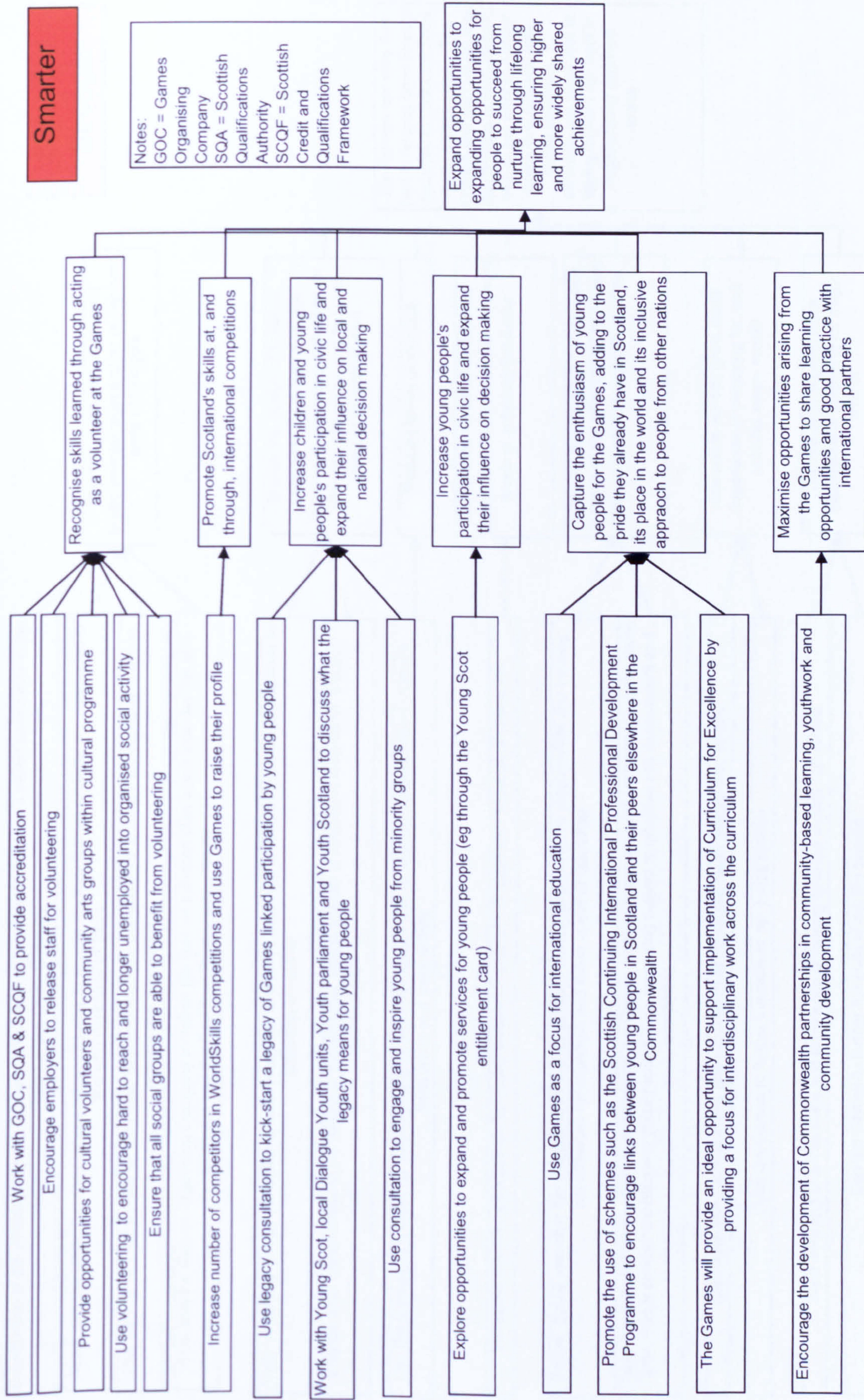


Figure 15 - The mechanisms through which the Games might make Scotland 'Safer and Stronger'

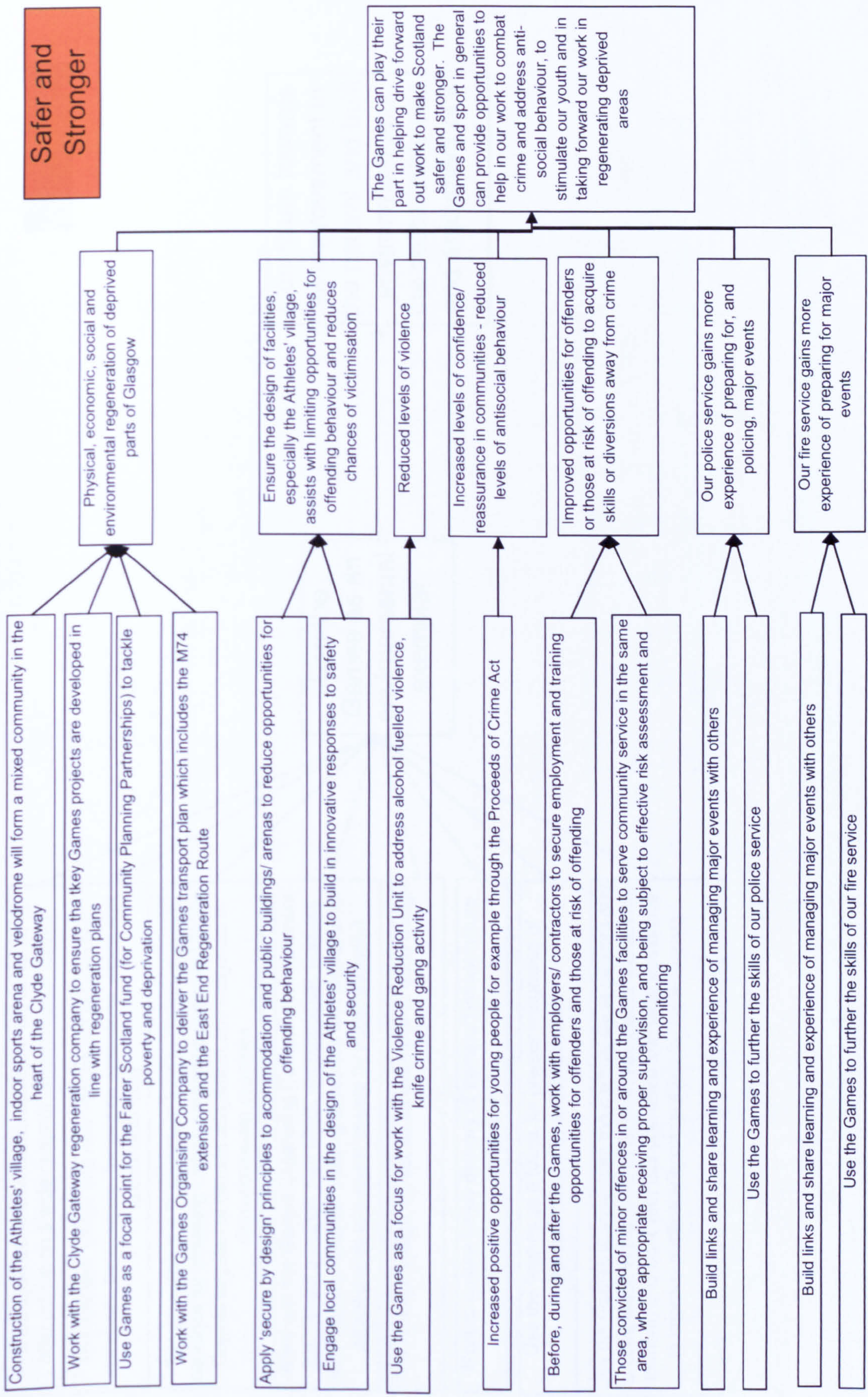
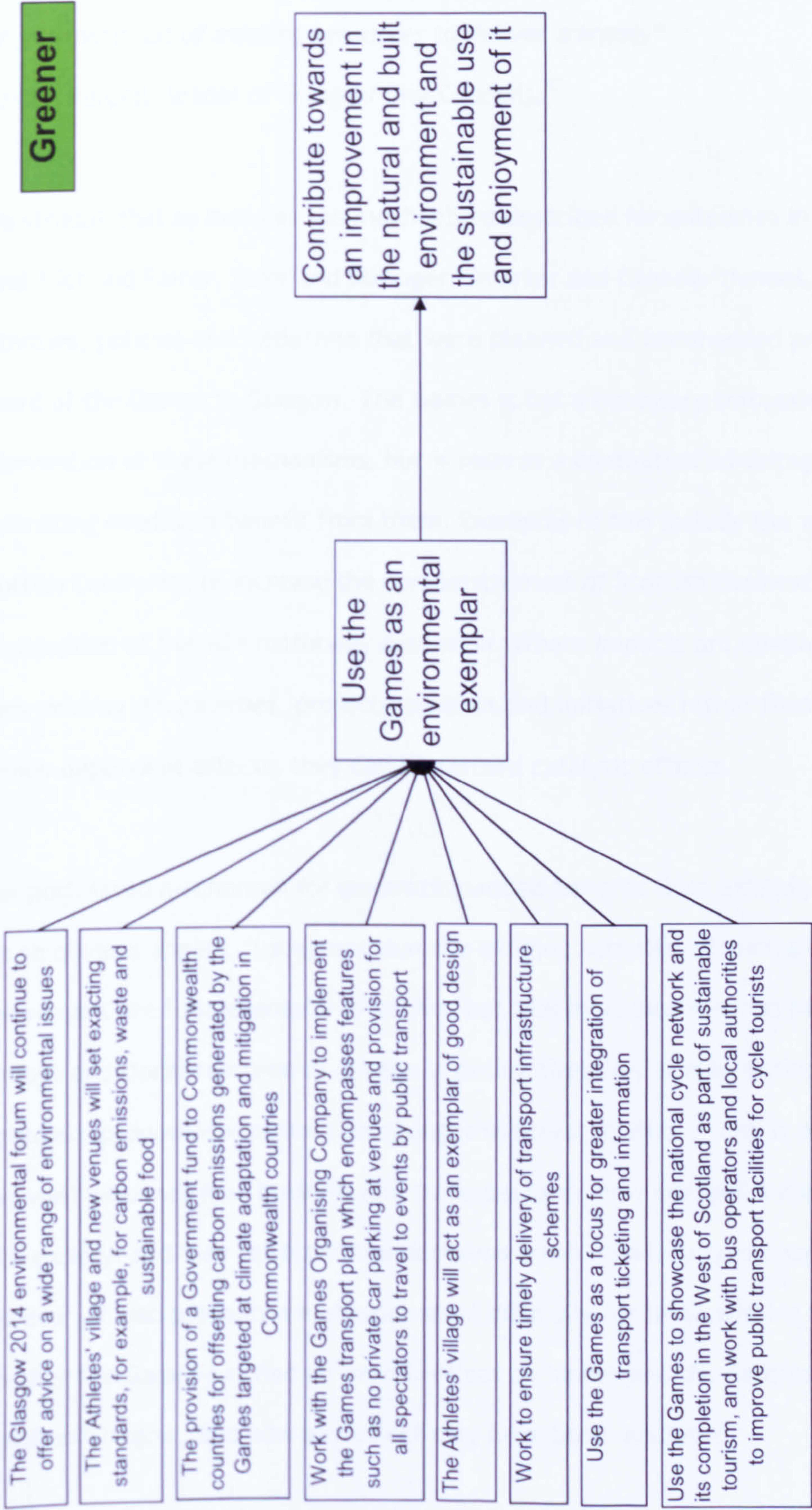


Figure 16 - The mechanisms through which the Games might make Scotland 'Greener'



The magic glitter of the Games?

“We believe that by using the excitement and glitter of the Games, we can get more out of existing resources to deliver a legacy”

(Steven Purcell, leader of Glasgow City Council).⁴⁷

It is striking that so many of the mechanisms described for outcomes in the Wealthier and Fairer, Safer and Stronger, Smarter and Greener themes, are activities, policies and initiatives that were planned and commenced prior to the award of the Games to Glasgow. The Games is not a necessary component intervention of these mechanisms, but is seen as a contextual advantage in generating maximum benefit from them. Examples of this include the work of Scottish Enterprise to increase the competitiveness of Scottish business and the construction of the M74 motorway extension. Where impacts are envisaged to arise from existing programmes, projects, policies and initiatives rather than from Games-dependent effects, they can be termed catalytic effects.

This postulated mechanism for generating added benefits from existing activities has an obvious appeal. It suggests that the existing activities of central and local government are fundamentally effective, but that more benefits can be realised without additional resource or change in policy direction. It is an entirely legitimate proposition: contextual changes in how a country or city is perceived may well influence how business and trade perform, how engaged a population feel with society, and may reflect in the decisions taken individually and collectively. However, it also presents a methodological difficulty for those wishing to explore whether the Games has had an overall effect on health and the determinants of health in Glasgow, and how any effect may have been mediated.

As a result of catalytic mechanisms being altogether more difficult to define and measure, it has the potential to be both a missed mechanism which has real impact, or an assumed (but imaginary) legacy impact that is used to justify the costs (both financial and other costs) without being subject to the same level of scrutiny which is applied to the other mechanisms.

There are three examples of catalytic impacts on population health included in the document: sports development activities which draw an increasing number of individuals from participation in sport to the achievement of excellence and elite status; non-alcohol-based evening leisure activities become more prevalent (such as the use of coffee shops instead of pubs); and the development of sustainable communities that provide an environment which fosters physical activity (as described in the Smarter Places, Smarter Choices policy initiative).¹⁵⁴

Direct impacts

There are however some examples of Games-dependent mechanisms. These are:

- Games-related construction and its economic and employment consequences
- The unique opportunity to market Scotland internationally as a host city
- To generate learning for volunteers and the emergency services related to the hosting of the event
- The construction of a new inner city neighbourhood (the athletes village)
- The opportunity to involve communities in Games-related decision-making
- The opportunity to provide an environmental exemplar through Games-related design, construction and procurement

Although these examples are dependent on the Games, they are to a large extent able to be replicated in a non-Games scenario. For example, the resources committed to Games-related construction could have been committed to similar construction projects without the event (which in turn could be argued to have similar economic and employment impacts). The opportunity to involve the community in decision-making processes or to provide an environmental exemplar could similarly be applied to such alternative construction projects. The mechanisms most clearly dependent on the Games for their implementation are: the opportunity to market the city and nation as a Games host; and the creation of a context-specific learning environment.

A Games effect or a project effect?

One of the features that has emerged in the drafting of the Government's legacy strategy from the consultation document⁴⁷ to the latest draft of the legacy plan¹⁴⁸ has been the emergence of a number of legacy projects. A proliferation of legacy projects is even more pronounced in the Glasgow City Council legacy plan.¹⁵⁵

These legacy projects are described as being the mechanisms which will deliver benefits from the Games; in addition to the independent effect that simply playing host might have and in addition to any catalytic effect on existing policies and initiatives. This fits with the recommendations made in the Department of Health's systematic review which considered that the 'festival effect' (i.e. the impact of the event on non-participants in physical activity) requires to be leveraged through specific activities and projects.⁵⁶ However, it somewhat undermines the idea that positive legacy benefits will arise per se from hosting a major sports event, and that playing host is intrinsically a good thing. It also raises the question of whether

the Games is a necessary component in the success or otherwise of these projects, or whether these projects could be implemented in the absence of the event.

5.4. Summary: what are the ‘active ingredients’ of the Games?

This chapter has explored how the Scottish Government expect the 2014 Commonwealth Games to impact on the health (and socio-economic determinants of health) from the perspective of decision-makers in Scotland. There are clearly high hopes for a large positive benefit to arise from playing host, and this has been described as arising through a number of different mechanisms. These mechanisms can be understood as being one of three types: direct Games-related impacts; catalytic effects; and project effects (sometimes termed leverage). By considering the mechanisms in this way it is possible to consider the common properties of each type of mechanism and their differences, and it provides the basis for discussing the likelihood of the different types of impacts and their evaluation in subsequent chapters.

Direct Games-related impacts

There are a number of integral components of hosting the Games which are common to all similar events including the construction and upgrading of sporting venues, international media exposure during the event, and an influx of tourists and athletes to the host city. There are a number of other components which happen in association with most events that can also be classified as direct impacts. In short, the defining feature of a direct impact is that it arises from an integral component of the event rather than as an add-on benefit. Interventions that generate direct impacts do not have a primary purpose of providing legacy benefits, although the way in which they are designed and implemented can influence the degree to which the local population is impacted. An example of this

is the plan for the athletes village for the 2014 Games in Glasgow to become an inner-city urban village after the event,¹⁴⁸ since the primary purpose of the village is to provide accommodation for the athletes during the event and the Games cannot go ahead without the provision of such accommodation.

The catalytic effect

The catalytic effect is that espoused by the former Glasgow City Council leader Steven Purcell when he talked of the, “glitter of the Games”: creating an environment where it would be possible to get more out of existing resources.⁴⁷

This category of impacts is the potentially serendipitous effect that might occur in a host city simply through its status as host. It is defined here as the impacts that do not require particular interventions or projects and that are difficult to plan for or measure, but that have a wide impact on the activities in and around the city perhaps because of changes in perception, culture and attitudes surrounding the city. This should not be confused with the prioritisation of some public sector or private sector activities over others, which carries an opportunity cost and does not represent ‘getting more out of existing resources’. This is a phenomenon which was associated with Sydney around the 2000 Olympic Games where capital spending on health and education was delayed in favour of sports infrastructure.¹¹⁹ There is a danger that existing interventions whose completion is given a higher priority because of the host city status are classified as having been catalysed by the event (e.g. the completion of the M74 motorway extension in Glasgow). When the resources committed with one intervention causes resources to be taken from another intervention, this is termed the ‘opportunity cost’. For the purposes of this thesis such changes in priority will be defined as direct effects, whereas effects without an opportunity cost can be ascribed to a catalytic effect.

Project effects

Project effects are those which arise through the design of specific interventions, initiatives and projects which are not integral to the hosting of the event. They are designed to provide 'leverage' from playing host by providing a link between a changed context and behaviour change (including health behaviour change). There is a possible difficulty in determining whether an effect is a project or direct effect, where a project or initiative is planned independently of the event but then is subsequently rebranded or relaunched using the event as a means of engagement.

6. Health impact assessment (HIA)

6.1. Overview of chapter

This chapter describes the Health Impact Assessment (HIA) undertaken in collaboration with colleagues in Glasgow City Council, the Glasgow Centre for Population Health and the NHS.

The HIA seeks to make recommendations to policymakers about the Games legacy plan such that the potential for positive impacts is maximised and the potential for negative impacts is minimised. To do this, it utilises the evidence synthesised in the systematic review and an intensive public consultation exercise to generate evidence-informed recommendations.

6.2. HIA method

Collaboration and governance

The HIA was undertaken as a collaboration between Glasgow City Council, the Glasgow Centre for Population Health, NHS Greater Glasgow and Clyde and myself representing the MRC Social and Public Health Sciences Unit. I was involved in all stages of the HIA (including the design of the 'Have Your Say' questionnaire; the design of the additional questions for the Glasgow Household Survey; and the various other methods of community engagement). I led on the synthesis of the evidence, the production of the recommendations and the writing of the final paper for journal publication. The recommendations formed part of a Glasgow City Council publication and were therefore subject to editing by the Glasgow City Council corporate policy team and the steering group for the collaboration. The corporate nature of the HIA also precluded any estimation of the net impact of the Games being included in the work.

A steering group for the 2014 health impact assessment (HIA) was formed in January 2008, which consisted of representatives from:

- NHS Greater Glasgow and Clyde
- Glasgow Centre for Population Health
- Glasgow City Council Corporate Policy
- Glasgow City Council Development and Regeneration Services
- Culture and Sport Glasgow
- Community Health & Care Partnerships
- Glasgow Community Planning

- The Medical Research Council Social and Public Health Sciences Unit

Representatives had a variety of backgrounds, including public health, equalities, sustainability, regeneration, sport, community development, and academia. Two smaller subgroups were subsequently formed: one to develop the scoping phase and one to take forward the community engagement and appraisal elements of the assessment. The standard WHO framework for conducting HIAs was followed, involving: screening, scoping, evidence gathering and appraisal, reporting and evaluation.¹⁵⁶

Screening

The HIA steering group considered the Glasgow 2014 Candidate City File¹ and agreed that a participatory health impact assessment should be undertaken on the Glasgow 2014 Commonwealth Games.

It was agreed at the screening stage that the geographical limits for the HIA would be the population of the City of Glasgow. An early discussion took place on the potential for combining the HIA with equalities and sustainability impact assessments. It was felt that it would not be possible to develop such an integrated assessment tool at this stage, but that the steering group would aim to ensure that strong equality and sustainability perspectives were incorporated in the HIA. Glasgow City Council agreed to commit itself formally to an HIA of the Commonwealth Games in its Council Plan for 2008-11.

Scoping

A brief review of the evaluations of previous major multi-sport events provided the basis for an initial scoping paper on the potential positive and negative health impacts of the Games. The steering group took a decision to hold an interactive one-day event with key stakeholders from a variety of sectors, representing local and national organisations.¹⁵⁶

There were two purposes of the scoping event. First, it was to consider all the potential health impacts of the Games, the size of the impact, the groups most likely to be affected and the potential for influencing decisions pertaining to the impact. This was in order to prioritise the issues for further assessment. It was also for the purpose of listening to the priorities, concerns and timelines of decision-makers with regard to the Games so that the findings of the assessment could be produced in a timely and accessible fashion.

The scoping event was held in August 2008 in Celtic Park - the site of the opening ceremony and adjacent to the site of the proposed Games village, National Indoor Sports Arena and the Velodrome. It attracted 120 delegates.

The event included a series of interactive workshops, facilitated by members of the Scottish HIA Network. Speakers at the event included consultants who were commissioned to evaluate the legacy planning of the Manchester 2002 Commonwealth Games.

The key areas of potential impact identified from the scoping event included:

- Employment and employability

- The effect on Glasgow's image
- Regeneration
- Civic pride (also described as a 'feel good factor')
- Health and wellbeing
- Infrastructure development
- The environment
- 'Cross-cutting' issues effecting different domains such as community engagement, tackling inequalities and community cohesion

These key areas of impact, along with the 'cross-cutting themes', were used to develop questions for public consultation and to inform direct discussions with people in local communities.

Evidence gathering

Evidence was gathered in three ways for the HIA: from the community using a process of community engagement; using the systematic review described elsewhere in this thesis; and from discussion with the evaluators from the 2002 Manchester Commonwealth Games. In addition, a review of the recent consultation exercises held in Glasgow was performed to ensure that the views expressed by the community previously were included in the appraisal. These documents were largely identified through discussion with local people through the Community Engagement Coordinating Groups and the Community Reference Groups. These included previous studies on health related issues and previous community engagement activity on related issues. Taking into account information that is already available and relevant to the focus of engagement ensured that the process met the "Planning" standard from the National Standards of Community Engagement.

In contrast to the scoping stage of the HIA, which targeted decision-makers and service providers, this stage was deliberately orientated towards the general public.

The purpose of this work was to give people opportunities to consider:

- whether they agreed with the potential impacts identified during the scoping event
- any other potential health and wellbeing impacts of the Games
- how any potential negative impacts could be mitigated and any positive impacts enhanced.

The National Standards for Community Engagement were adopted as the quality standard for this process¹⁵⁷ alongside a tool called Visioning Outcomes in Community Engagement (VOiCE) to guide and record the process of effective community engagement. The community engagement aspect of the Commonwealth Games HIA was invited to be one of six national VOiCE “development sites”. This had the benefit of additional support from the Scottish Community Development Centre (SCDC), which gave an extra dimension to the process evaluation and allowed an exploration of the extent to which the process outcomes contributed to health improvement outcomes. This evaluation process is not yet complete.

In preparation for this stage of the HIA, two interactive training events were held in October 2008 with representatives of organisations currently involved in community engagement in Glasgow. These representatives were given training in the National Standards for Community Engagement and in Participatory Appraisal

methods. These organizations were then encouraged to undertake engagement exercises on the potential impacts of the Games with their own constituencies and to feed this back into the appraisal process.

The process of community engagement had four distinct parts which are described below:

Presentations to existing community groups

Efforts were made to establish the best way to utilise existing community engagement structures as part of the HIA process. This involved close working with Local Community Planning Partnerships. The Engagement Network Coordinators based within Glasgow's Community Planning Partnerships (CPP) assisted in the mapping of previous community engagement activity in each CPP area. In addition, community engagement activity at a local level was coordinated through Community Engagement Coordinating Groups. Presentations were also made to all 13 Community Reference Groups across the city to raise awareness of the work. These are panels of local residents from each of the ten Local Community Planning Partnership areas and additional council-wide groups (e.g. disability and young persons forums). They aim to be representative bodies which reflect the geographical and population mix within areas and the equalities aspects of community engagement.

Glasgow Household Survey¹⁵³

The HIA appraisal subgroup developed specific 2014 legacy questions for the Glasgow Household Survey to feed into this stage. The Household Survey is conducted twice a year by an independent company on behalf of Glasgow City Council. It involves an initially random sample of addresses whose residents are interviewed in their homes on issues about the city. Where there is no resident

home when the interviewer calls on two occasions, neighbouring houses are sampled instead. These questions were included in the autumn 2008 survey of 1,200 residents across the City. Although specific questions were defined for the household survey there was no opportunity to influence the sampling methodology.

'Have Your Say' Workshops

Subsequently, a series of 'Have Your Say' workshops were organised in communities across the city. Eighteen events (with a total of 42 discussion groups) were held in total and attended by over 350 community members. This included workshops with targeted youth groups and equality groups.

'Have Your Say' Questionnaire

The 'Have You Say' questionnaire was specifically developed for the HIA and based on the themes which emerged from the HIA scoping phase. The electronic version of a 'Have You Say' questionnaire was posted on the Glasgow City Council website in October 2008. The consultation end date was December 30th 2008. Seventeen thousand paper copies of the questionnaire were distributed via GP and dentist surgeries, Local Housing Organisations, Culture and Sport Glasgow community venues, libraries, sport and leisure centres and museums, and City Council premises. The paper questionnaire is shown in Appendix 9 (the internet version mirrored this).

Community Engagement Feedback Events

The National Standards for Community Engagement give clear guidance about how information should be fed back to the wider community and the agencies affected.¹⁵⁷ Therefore, following the stakeholder involvement phase, events were held in each of Glasgow's 5 strategic planning areas in March 2009 in order to

provide feedback to local communities and stakeholders on the findings of this stage, and to verify that the issues identified were appropriate. The Council's Executive Member for Commonwealth Games Delivery also spoke at these events, along with the then recently-appointed Legacy Manager. This gave communities an assurance that this work was already being taken into account in the City's legacy planning process, and ensured that the key decision-makers were expecting to incorporate the HIA recommendations.

Appraisal

During the appraisal stage the evidence for the potential positive, negative and differential impacts was collated and analysed.

The aim was to state recommendations within each theme which were evidence-informed and achievable. Where possible, the recommendations took recognizance of existing policies and programmes in operation, or planned, by the City Council and its partner agencies.

Furthermore, recommendations were made that are specific and measurable. In some cases it was only possible to make general recommendations because some plans are still being formulated.

Reporting

On completion of the final report, a summary was made available in public venues, on the internet and was also circulated to Community Reference Groups.¹⁵⁸ In addition, the full report was presented to the Council's 2014 team for consideration in the development of the Glasgow 2014 Legacy Plan.¹⁵⁹ The

document was also presented to those responsible for the Scottish Government legacy framework.

Monitoring and Evaluation

Following the World Health Organisation guidelines on performing an HIA, there are three elements of evaluation that should be carried out:

- a process evaluation relating to the conduct of the HIA
- an HIA outcome evaluation looking at the way in which the HIA was used by decision-makers
- a Games outcome evaluation.

The first two of these are currently being conducted by the HIA steering group. The appropriate methods to evaluate the outcomes of the Games themselves will be discussed further in later chapters.

6.3. HIA results

Scoping

The key areas of potential impact identified from the scoping event were: employment and employability; the impact on Glasgow's image; regeneration; civic pride; health and wellbeing; infrastructure development; the environment; and a number of cross-cutting themes such as community engagement, tackling inequalities and community cohesion. Engagement with senior decision-makers within the city was achieved and the event prepared them to receive the HIA recommendations, which in due course they would be expected to consider.

Evidence gathering

*Glasgow Household Survey*¹⁵³

There were 1,068 people included in the survey. No information is available on how many households had to be substituted for by neighbouring houses. The additional questions on the Games legacy that were added to the six-monthly household survey showed that residents believed the Games would have a positive impact on them, their families, their local area, and Glasgow as a whole. Those living closest to the planned Games village were less likely to believe there will be a positive impact on themselves and their families. For Glasgow to benefit as much as possible from the Games the priorities, according to residents, were to improve the image of Glasgow and provide access to employment opportunities associated with the Games.

'Have Your Say' workshops¹⁶⁰

The key areas of potential impacts identified from the workshops included employment and employability, public transport, crime and security, and improved facilities for physical activity. A desire for enhanced community engagement, a reduction in inequalities, social inclusion and community cohesion were also expressed.

'Have Your Say' questionnaire⁴²

There were a total of 1,366 electronic responses and 274 paper returns of the questionnaire. The analysis of these responses indicated that boosting civic pride and the cultural programmes attached to the Games were particularly important to respondents. Many thought that promoting a feel good factor would be the strongest legacy of the Commonwealth Games. It was perceived that a key legacy would be improved sports facilities in terms of their accessibility and suitability. However, people felt that in order for the Games to have a lasting legacy, the local community would need to be actively engaged throughout the planning and delivery of the Games. Seventy five percent of those answering the questionnaire expressed a desire to be involved in some capacity.

Appraisal

The evidence available suggested that the Games were likely to impact on a wide range of the determinants of health. This included relatively 'hard' outcomes such as the economy, and 'soft' outcomes such as civic pride. Potential impacts on particular determinants of health were identified (Table 1), although it was difficult to predict the likelihood of these impacts (either positive or negative) being realised.

*Community Engagement Feedback Events*¹⁶⁰

The community engagement feedback events provided feedback to local communities and stakeholders on the findings of the evidence gathering and appraisal and verified that the impacts identified were appropriate.

Recommendations and reporting of the HIA

The summarised recommendations are shown in Table 3 (full details of the recommendations and the evidence underpinning them are available in the full report which was published at

<http://www.glasgow.gov.uk/en/AboutGlasgow/AGamesLegacyForGlasgow/>).

The impacts of the plans can be seen (and framed) as opportunities or threats. For example, the planning of new sports facilities can be seen as an opportunity for the community to be empowered through being involved in their design, or can be seen as a threat to community empowerment if infrastructure is perceived to be imposed on a community without their involvement or consent. This tension is present in all of the potential impacts of the plans and no prediction of how likely a positive or negative outcome was given (Table 3). However, a series of clear recommendations was developed for improving the potential for positive impacts arising. Thus, even where the overall impact on employment (for example) was uncertain, it was possible to suggest policy modifications that would maximise the positive impact on health and health inequalities. The recommendations drew upon existing strategic plans and the policy context in Glasgow.

Table 3 - Summarised recommendations from the HIA

	Evidence appraisal	Potential impacts on health or the determinants of health	Recommendations
Infrastructure (facilities)	<ul style="list-style-type: none"> • The long-term viability of facilities and accessibility was prioritised by the public (especially relating to cost, physical access and transport to facilities)^{42, 153, 161, 162} • The need for increased capacity for public use was highlighted following the 2002 Games¹⁰² • Access to affordable, healthy food within the new sporting facilities was highlighted by the public⁴² 	<ul style="list-style-type: none"> • Increased physical activity • Limited accessibility (in terms of physical access, transport and cost) 	<ul style="list-style-type: none"> • New facilities should be accessible to local people and meet their needs in years to come
Infrastructure (transport)	<ul style="list-style-type: none"> • There was some public support for the creation of a sustainable and comprehensive transport system^{42, 88, 153, 156, 160} • There was concern that new roads would divide communities, lead to accidents and create pollution^{7, 20-26} • The plans should enhance active travel^{42, 88, 153, 156, 160, 161} • There was concern about possible congestion during the event^{42, 156} 	<ul style="list-style-type: none"> • Increased noise pollution, air pollution, community severance, traffic accidents and congestion • Shift towards physically active forms of transport 	<ul style="list-style-type: none"> • Disruption during construction and the Games should be minimised • Accessible and user-friendly transport should be developed as part of the plans
Civic pride and City image	<ul style="list-style-type: none"> • Civic pride is perceived to be the main benefit of playing host⁴² • It was a public priority to use this opportunity to improve Glasgow's image^{42, 156, 163} 	<ul style="list-style-type: none"> • Increased civic pride • Increased tourism and trade • Negative publicity for the city and its people 	<ul style="list-style-type: none"> • The community should be involved in the promotion of Glasgow as a friendly city • A strategy to improve the city's image should be developed

	Evidence appraisal	Potential impacts on health or the determinants of health	Recommendations
Health and wellbeing (individual behaviour change)	<ul style="list-style-type: none"> The public perceived an opportunity for increased physical activity^{42, 153, 161, 163}; increased access to healthy food;^{156, 161, 163} and to reduce alcohol and tobacco consumption,^{161, 164} but there were concerns that these opportunities would be unequally spread^{42, 156} There was concern that Games sponsorship could undermine health promotion messages^{94, 156} 	<ul style="list-style-type: none"> Increased health inequalities Increased physical activity, increased access to healthy food and reduced smoking Increased alcohol use 	<ul style="list-style-type: none"> Use opportunities to increase healthy eating, smoke-free environments and physical activity (including safer active travel)
Housing and public space	<ul style="list-style-type: none"> The Games village was expected to be an important legacy with potential for positive and negative impacts for the existing and incoming residents^{42, 88, 153, 156, 161-163} 	<ul style="list-style-type: none"> Creation of a sustainable, cohesive and vibrant new community Gentrification and social division with existing community in Dalrnarnock Rising housing costs 	<ul style="list-style-type: none"> Use healthy and sustainable urban design principles Involve the local community in decision-making around the Games village Create an appropriate mix of social and private housing in the Games village
Participation in cultural & sporting events	<ul style="list-style-type: none"> The public were keen to develop a cultural legacy for all parts of the community^{42, 153} A well designed cultural programme was believed to be able to empower and educate^{161, 163} 	<ul style="list-style-type: none"> Increased pride, empowerment and cultural awareness Reduced crime 	<ul style="list-style-type: none"> Involve local people in event planning A brand logo should be provided for community use
Economy & employment	<ul style="list-style-type: none"> The creation of sustainable jobs and skills for local people was a public priority^{42, 153, 161-163} Procurement was identified as an opportunity to stimulate the local economy and promote ethical and sustainable business^{42, 153, 156, 163} The cost of the event was a concern including the potential for funds to be diverted from other services^{42, 119, 156} 	<ul style="list-style-type: none"> Increased employment and tourism Employment opportunities unequally distributed and short-term 	<ul style="list-style-type: none"> Locals should be given support to access employment and training opportunities Small business should be supported in bidding for Games contracts The Games budget should be transparent and the impact on services minimised

	Evidence appraisal	Potential impacts on health or the determinants of health	Recommendations
Volunteering	<ul style="list-style-type: none"> • Volunteering was identified as a route to increasing employability^{42, 153} • The experience of volunteering at other events was mixed^{132, 152, 165, 166} • There was evidence that volunteers could be encouraged by: being part of a 'big event'; personal development goals; and the promise of meeting new people^{42, 153} 	<ul style="list-style-type: none"> • Increased employability • Increased volunteering in the city after the event • Inequality in the uptake of volunteering opportunities 	<ul style="list-style-type: none"> • Local people should be supported to access volunteering opportunities • Volunteers should receive expenses and training (linked to employability)
Community safety, antisocial behaviour and crime	<ul style="list-style-type: none"> • The Games are perceived as an exacerbating factor for crime and anti-social behaviour, but also an opportunity for improvement (particularly with respect to diversionary activities)^{1442, 88, 153, 161-163} • There is potential for an increase in substance misuse, particularly around the closing ceremony^{99, 156} • The Games were seen as an opportunity to increase the cleanliness of the streets and enhance toilet facilities¹⁶⁰ • Evidence from a previous event suggests that demand for police services will increase¹³⁴ 	<ul style="list-style-type: none"> • Increased alcohol-related antisocial behaviour • Increased crime • Cleaner streets 	<ul style="list-style-type: none"> • Alcohol licensing laws should be strictly enforced • The opportunity for improved cultural awareness should be utilised • A detailed crime reduction policy for the Games should be planned
Community engagement	<ul style="list-style-type: none"> • There was clear public demand for community involvement in Games-related decision-making⁴² • The National Standards on Community Engagement were identified as a useful tool to ensure adequate public involvement¹⁶⁷ 	<ul style="list-style-type: none"> • Communities are engaged and empowered 	<ul style="list-style-type: none"> • The National Standards of Community Engagement should be implemented and independently evaluated for all aspects of the Games planning

	Evidence appraisal	Potential impacts on health or the determinants of health	Recommendations
Sports development legacy	<ul style="list-style-type: none"> Developing a sports legacy was not a public priority, although a grassroots sports legacy was seen to be more important than that for elite athletes^{42, 153, 156} There was a minority view that sport could be used to engage excluded groups^{42, 153, 156} 	<ul style="list-style-type: none"> Increased sports participation Increased inequalities in sports participation 	<ul style="list-style-type: none"> Grassroots sports participation should be prioritised through increased coaching and facilities for the general public
Environment, sustainable development and carbon footprint	<ul style="list-style-type: none"> The Games were identified as an opportunity to develop sustainable procurement, waste management, reduce air pollution and improve the urban environment^{42, 88, 153, 156, 161, 163} The construction of facilities was recognised as a potential source of noise and air pollution¹⁵⁶ 	<ul style="list-style-type: none"> Environmental improvements (urban drainage, transport design, new village housing) Improved procurement Noise and air pollution 	<ul style="list-style-type: none"> Sustainability should be embedded into all Games related projects The Games should be used to showcase environmentally-friendly practice especially related to the design of the village
Monitoring and evaluation	<ul style="list-style-type: none"> The evidence base for the impacts of major sports events is of poor quality and is sparsely populated 	<ul style="list-style-type: none"> Future events are able to learn from Glasgow's experience 	<ul style="list-style-type: none"> Robust evaluations of the: HIA process; influence of the HIA; and impact of the Games should be undertaken

7. Evaluating the 2014 Games

7.1. Overview of chapter

This chapter picks up one of the key recommendations of the HIA made from the previous chapter: that the 2014 Commonwealth Games should have a robust evaluation to quantify the impacts on the host population.

It details and critically appraises the most appropriate methods for evaluating the Games using the classification of impacts outlined in Chapter 6: direct impacts, catalytic effects and project effects.

The learning from the critical appraisal undertaken of the evaluations of previous events done as part of the systematic review (Chapter 5) is also used to avoid the known methodological shortcomings.

The chapter finishes by making a series of recommendations on the best evaluation approaches for the 2014 Games.

7.2. Method: evaluating the 2014 Games

A framework for evaluating the Games was created by first using the theories of change developed by the Scottish Government (Chapter 6) and in the Health Impact Assessment to categorise the mechanisms of action into different types. The key features of each of these categories were then described to facilitate an appraisal of how best to evaluate them.

The learning from the systematic review critical appraisal of evaluations of previous events was used to inform the design of the proposed 2014 evaluation for each category such that the quality limitations uncovered from previous work could be minimised.

7.3. Results: the implications of complexity

The Commonwealth Games can be thought of as a complex social intervention. It is complex because it has numerous interacting components in a variety of organisations with a large number of likely intended and unintended consequences targeted at a wide variety of the determinants of health. This fits with the definition of a complex intervention as described by the MRC (Figure 17).^{74, 168}

As discussed in the critique of the Scottish Government's theory of change for the Games, the impacts are envisaged to occur through a variety of interacting mechanisms. These interactions may generate intended and unintended consequences which may have positive or negative outcomes. As these impacts are realized, they can develop their own momentum, something termed 'emergent properties'. The emergent properties are akin to positive feedback loops or phenomena that escape homeostatic mechanisms. Furthermore, emergent properties often display 'path dependency', where the new pattern becomes established and resistant to change even where better alternatives exist. Classical examples of this in history have been the 'QWERTY' keyboard which was designed to reduce the speed of typists to protect mechanical typewriters and VHS videos, which were technically inferior to their competitors but became established because of their widespread availability. These are features of complex (and sometimes not so complex) interventions in the context of a complex society.¹⁶⁹

The implication of such complexity is that determining the impact of the 2014 Games on the local population is a difficult task that is unlikely to generate a clear, unambiguous result. Earlier in the thesis it was argued that evaluations of

previous major sports events have been piecemeal and limited by methodological difficulties and scarce resources. This chapter will argue that some simple methodological improvements could improve the quality of the evidence derived from the 2014 Games, but that the quality of this evidence will be challenged by limitations inherent to the nature of the intervention.

Figure 17 - Features and implications of complex interventions (adapted from Craig 2008)⁷⁴

Features of complex interventions include:

- The intervention comprises several components
- The intervention components interact
- The target group for the intervention is diverse
- The intervention generates several outcomes in a variety of domains
- It is necessary to tailor the intervention to the local context

The implications of this complexity for evaluators include:

- A need for a theoretical understanding of how the intervention causes change
- Implementation failure is more likely and requires specific focus
- Variability in outcomes for individuals will be related to group and population effects
- A range of outcome measures will be required
- Protocol fidelity is often inappropriate

Complex social interventions are particularly difficult to evaluate. The MRC has produced a framework for the evaluation of such interventions which outlined some of the methods most appropriate for tackling the challenges which this complexity generates.¹⁶⁸ Key to the guidance is how the intervention can be planned such that an experimental design can be introduced where possible, or how a comparison group with minimal risk of confounding or bias can be created if an experimental design is not possible. Although this is useful for many complex interventions, the very nature of the Games precludes an experimental design because the timing and exposure cannot be altered or planned to maximise the prospects for a rigorous evaluation (with the possible exception of the project effects arising from the various legacy programmes).

The counterfactual

The counterfactual is the situation that would have arisen had the intervention not taken place. Ideally, randomisation between intervention and control groups can ensure that the counterfactual (and therefore the attributable impact of the intervention) is known. This ideal is clearly not possible for the Commonwealth Games which cannot be randomised as the decision to allocate to a particular city arrived at through a bidding process.

Glasziou and colleagues have described some of the features of outcomes that can mitigate against the need for randomised trials.¹⁷⁰ They describe a number of clinical interventions that were widely adopted without recourse to randomised evaluation and sought to understand what features they possessed that allowed effectiveness to be accepted. Using the Bradford-Hill criteria¹⁷¹ they suggested that a large effect; a temporal relation (cause preceding effect); and plausibility are the three most useful criteria. Unfortunately the first two of these are difficult to

utilise in the case of the Games: the effect sizes are likely to be small; and time trends for many outcomes (such as employment, economic growth, sports participation) often have a large degree of background variability and may change before the event even when the event is the causal factor (e.g. due to the building of new infrastructure in preparation). The fact that such outcomes are plausible from major sports events has not helped clarify the net effect of previous events since both positive and negative impacts are plausible.⁶⁷

Another major difficulty is the heterogeneity of major sports events both in terms of the intervention and the context in which they take place. Two approaches have been developed to embrace the contextual differences instead of the traditional approach of attempting to 'control' for these effects and describe an independent impact. The first, described by Hawe and colleagues is to standardise the, "steps in the change process that the elements are purporting to facilitate or the key functions that they are meant to have", instead of the usual practice of standardising the components of the intervention.⁸³ This has the advantage of facilitating comparison of an intervention (tailored to local circumstances) to non-intervention. This model remains limited in its usefulness for the problem described here however, since major events cannot be randomly allocated, nor does the same event occur concurrently in different places to allow detection of the independent intervention-related impact from the contextual background 'noise'. However the idea that interventions do not need to be standardised in their implementation has been adopted implicitly in the systematic review that attempts to synthesise outcomes from a diverse array of 'standard' Games implemented in different ways in a range of contexts. The second approach is Pawson and Tilley's 'realistic evaluation', which aims to describe what is effective, for whom and in what contexts.⁷⁶ It does this by generating a programme theory

about how change might occur, before testing its components with a fluid collection of measures and outcomes designed to answer its triumvirate of questions. This is more applicable to the evaluation of major sports events but does not resolve the question of defining comparison groups. The realistic evaluation approach is similar to the ‘theories of change’ approach advocated by Mackenzie and Blamey,¹⁷² although with important differences: ‘theories of change’ has a greater emphasis on measuring quantitative change in the overall and intermediate outcome measures.⁸⁴ All of these approaches have the advantage of seeking to find interventions that work in the contexts in which they are placed, rather than attempting to find idealistic, but ultimately unobtainable, circumstances in which an intervention might be effective.

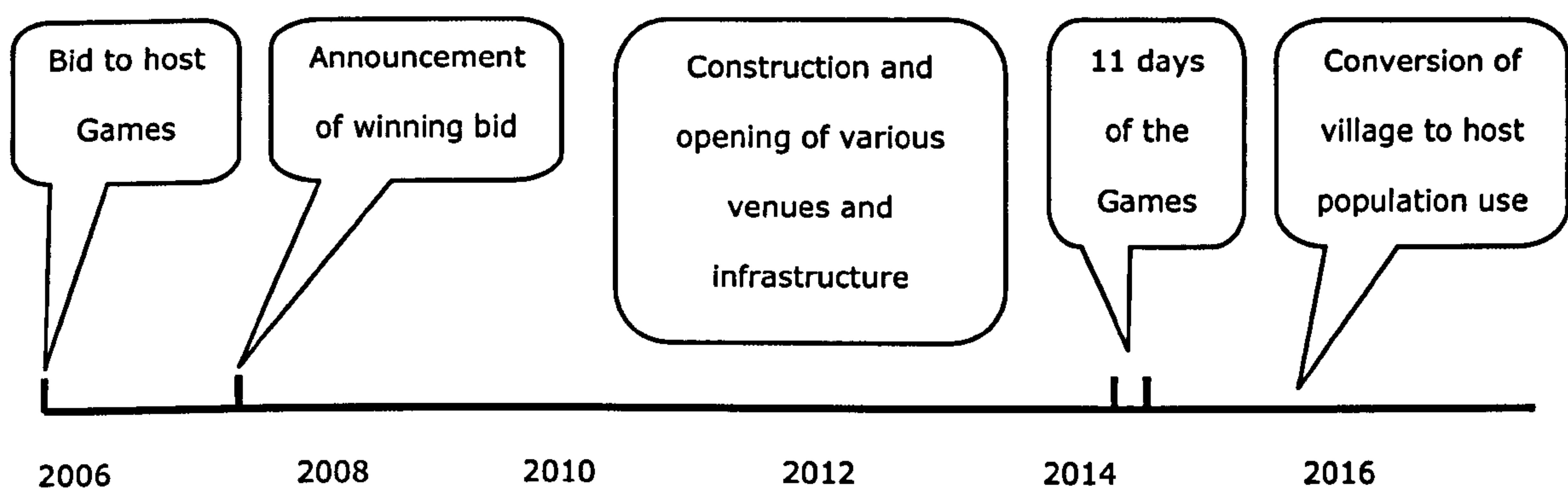
The outstanding challenge therefore in evaluating the effects of major sports events, even where a programme theory as described above is applied to unpack the mechanisms and context that influence outcomes, is the attribution of outcomes to the intervention. Of the usual armoury of tools to tackle this - the use of comparison groups, randomisation and repetition to ensure consistency¹⁷³ - only comparison groups are available as an option.

Defining the exposure

The Commonwealth Games is clearly a complex intervention, but it can also be described as a diffuse ménage of separate interventions. Each of these has a different reach in how it might affect the population, and this reach may be geographical for some aspects, by age or gender for others, by groups of interest (e.g. sports fans or building constructors), or by other habits and common features (e.g. tourists). Therefore, defining who is exposed to the ‘intervention’ is difficult.

A further complicating factor is the timing of exposure. With many interventions there is a specified time point, or time period, at or during which individuals and populations are exposed. With major sports events the exposure timing is less clear (Figure 18).

Figure 18 - The timing of exposure to the 2014 Games



Overview of evaluation methods

As discussed above, randomisation is not an option for most aspects of the Games intervention. This restriction on randomisation therefore precludes all experimental designs including randomised controlled trials (RCTs), regression discontinuity designs¹⁷⁴ and stepped wedge designs.¹⁷⁵

Instead, concurrent comparison groups or an internal comparison (i.e. a before and after comparison) can be considered.¹⁷⁶ However, both of these options also pose difficulties for the evaluation of the 2014 Games in two significant ways. First, the impact of the Games is not limited in its geographical reach for many of its possible mechanisms of action (e.g. role models, national pride, economic growth). Thus, local comparison groups are likely to be ‘contaminated’ by the intervention. More geographically distant comparison groups are of course possible, but the

comparability between groups becomes more tenuous. The alternative to this is to use an internal comparison group, such as with an interrupted time series (sometimes termed a repeat cross sectional study and the form of most routine government statistics). A more advanced version of this would amount to a cohort study where the same group of individuals is followed through time with regular data collection to facilitate before-and-after comparisons. This however is subject to a second problem, that of a secular trend in the outcomes of interest (e.g. physical activity, employment, well-being, economic growth). Without the availability of an external concurrent comparison group attribution of effects to the intervention become virtually impossible.

If the expected change in an outcome is large and focused (i.e. restricted to a very specific outcome) in the exposed population, the difficulty in attributing such a change to the intervention is reduced, as are the risks of bias. One example of this would be the evaluation of the new legislation prohibiting smoking in public places in Scotland.¹⁷⁷

Yet most interventions, and certainly major sports events, do not fall into that category (see Chapter 3). Major sports events are proposed to have a wide range of impacts, over several years with small net changes (although with a potentially large population impact because of the number of people exposed).¹⁷⁸

Furthermore, defining who is exposed to many aspects of the intervention is difficult because of the mediated nature of the many of the mechanisms (e.g. the influence of role models on physical activity rates as seen on the television).

Each of the options discussed below has advantages and disadvantages for the evaluator in these circumstances.

7.4. Evaluation methods for complex interventions

Prospective cohort studies

A cohort study is when a defined population is followed through time with the outcomes of interest being measured periodically. It is similar to a randomised control trial (RCT) except that the exposure is not randomized (it is a descriptive and not experimental study) and the proportion of the cohort exposed to the intervention or phenomenon can vary from 0% to 100%.

There are particular advantages of this design: an evaluation of whether the putative exposure precedes the outcome can be made; recall bias is reduced because the degree of exposure can be closely determined; a wide range of expected and unexpected outcomes can be determined because the exposed group is followed through time; and the counterfactual can be evaluated because some of the cohort is not exposed (allowing a statistical inference termed the relative risk or hazard ratio to be calculated). Cohorts can also be used to evaluate numerous other hypotheses in the community of interest if there are sufficient baseline differences and exposures.¹⁷⁴

Despite these powerful merits, there are significant disadvantages of a cohort design. The power to test multiple outcomes of interest over a prolonged period of time can lead to the discovery of spurious associations (on the basis that 5% of all tested hypotheses will be 'statistically significant' using the standard parameters). This drawback can be mitigated by the use of a theory to identify a limited number of hypotheses of interest, but this requires a degree of self-restraint that may not be easy in the predominant academic culture where there is great incentives to publish results on as many hypotheses as the cohort facilitates (Figure 19).¹⁷⁴

Figure 19 - The dangers of multiple hypothesis testing in cohort studies¹⁷⁴

Since cohort studies start with the exposure of interest they, by definition, cannot know what proportion of the cohort will develop the outcomes of interest. If the outcomes are uncommon then a very large sample is required to detect a true difference. This is an important drawback when the causes of a particular outcome (e.g. a rare cancer) are being investigated. However, it is not a limitation where the interest is in whether the exposure (or intervention) has an effect. Therefore in this case, when the interest is in whether the Games will improve the health of the population of Glasgow, the cohort design is not limited in this way.

The participants in cohort studies are selected on the basis of their exposure. Prospective cohort studies are possible when it is possible to know who is going to be exposed in advance and recruit individuals appropriately before exposure. If it is

more difficult to predict who is going to be exposed, perhaps because the exposure requires individuals to volunteer, a prospective cohort may only contain a small proportion of exposed individuals. If this is the case the cohort sample required at the initial data collection point can be prohibitively large. This is a particular issue because of the need to follow a large number of people for a prolonged time period in every cohort study, even where the proportion of exposed individuals is high. This is resource intensive, and even more so if the proportion of the cohort exposed is small. This is a relevant concern for the evaluation of the Games. For many of the possible Games-related exposures that individuals may experience, it is difficult to predict in advance who will be exposed. Furthermore, the proportion of the total population for many of the individual mechanisms (exposures) may be small. However, for some of the other exposures (e.g. the possibility of gentrification in the community around the Games village) it is possible to define a likely exposed (and non-exposed) group. Therefore a cohort study may be appropriate for those aspects of the Games that are likely to effect a large proportion of the total population or a large proportion of a very tightly defined population (e.g. residents in the immediate area around the Games village).

The need to follow individuals through time can also introduce another bias, as the individuals lost to follow-up are likely to be different to those retained in the study (e.g. the more ambitious members of the cohort may be more likely to move cities to find employment). If the proportion of the cohort lost to follow-up is large then the validity of any inference made on the basis of the remaining cohort is reduced. Cohort studies therefore require a significant commitment from funding bodies and academics over a prolonged time period if they are to generate useful evidence.

Retrospective cohort studies

Retrospective cohort studies can be used when the purpose is to evaluate the impact of an exposure to an intervention but where it is not possible to know in advance who in the population will be exposed to the intervention. A comparison group of individuals can then be recruited that is similar to the exposed group. This is particularly relevant to the evaluation of the project effects from the Games.

Difficulties arise with this study design where there is uncertainty about the exposure (e.g. if the measure of exposure is reliant upon the recall of the participants instead of a register or similar); where there is a lack of historical information to ensure that potential confounding factors are accounted for; and where the cohort is recruited on the basis of exposure (as is being proposed here), in recruiting a comparison group without introducing bias.

This study design is cheaper than a (prospective) cohort study however since less resource has to be used in tracking individuals through time.

Propensity scoring

As has been discussed, one of the vexed questions in the evaluation of non-randomised interventions is the identification of a comparison group which has all the same characteristics as the exposed population with the exception of the exposure. It is often very difficult in observational epidemiology to obtain such a comparison population and this then requires statistical adjustment to be made to allow for the pre-exposure differences between the two groups (the confounding factors which associate the exposure and outcome independently of the intervention).¹⁷⁹

One such method to create a valid comparison group is propensity scoring (sometimes known as the use of instrumental variables).^{180, 181} This is a method of calculating the probability of an individual being exposed based on the presence or absence of a range of covariates. This is therefore a method of reducing the confounding in observational studies, such as cohort studies, in order to increase the certainty with which it is possible to identify the independent impact of interventions. However, it is not clear that there are instrumental variables available that might be used in relation to exposure to the Games interventions.

Ecological studies

Ecological study designs rely on the comparison of groups rather than of individuals. Where an ecological study has more than one point of data collection it is often termed a repeat cross sectional study or an interrupted time series (particularly where there are a large number of data points before and after the exposure). Comparison is often made between populations over time (e.g. geographical communities or occupational groupings) which allows some inference to be made about whether any change is related to the exposure or simply due to a secular trend seen in both the exposed and non-exposed groups.

Ecological studies are of most use when there is an exposure where groups of individuals are exposed and it is not possible to identify individuals from the same group or community who are not exposed. Common examples of this might be an evaluation of an area-regeneration scheme or the evaluation of a nation-wide policy change. It is also the most appropriate study design where the outcome of interest relates to a group of people rather than individuals. For example, if the hypothesis being tested is that income inequality in a country reduces mean life expectancy, it is inappropriate to use data on individual income and life

expectancy to make an inference at the level of the population (the so-called atomistic fallacy).¹⁸² Most importantly, ecological studies can often take advantage of routinely available statistical data and do not require new data collection. This means that they can be performed retrospectively and very cheaply.

Interrupted time series evaluations have been proposed as the most appropriate method to evaluate the emergent properties of complex adaptive systems.¹⁸³ This is because these properties can appear late and are unpredictable in their nature (and therefore require a large number of outcomes to be monitored).

The biggest disadvantage of the ecological design is the counter of the atomistic fallacy: an inference made of an association at the level of populations cannot then be applied to individuals (the ecological fallacy).¹⁸² Thus, if the hypothesis that is being tested is whether an individual exposed to a particular aspect of the Games is more or less likely to be healthy as a result, the ecological design is inappropriate. However, if the hypothesis is that the Games is associated with an improvement in the health of the population of Glasgow, the ecological design is more appropriate than either the cohort or case-control design.

Determining whether an association in an ecological study is a causal relationship is particularly problematic, especially when there are no non-exposed groups for comparison. Various patterns can be observed.^{170, 184, 185} These are illustrated below with respect to a fictitious intervention that is associated with an increase in the outcome of interest. This can involve a sudden increase in the outcome following the intervention (Figure 20); a sudden increase with a further continuing increase following the intervention (

Figure 21); a rapid increase which levels off through time (Figure 22); a sudden increase which diminishes through time (Figure 23); or a gradual increase following the intervention (Figure 24).

Figure 20 - Intervention associated with a rapid then stable increase in an outcome (adapted from Glass)¹⁸⁴

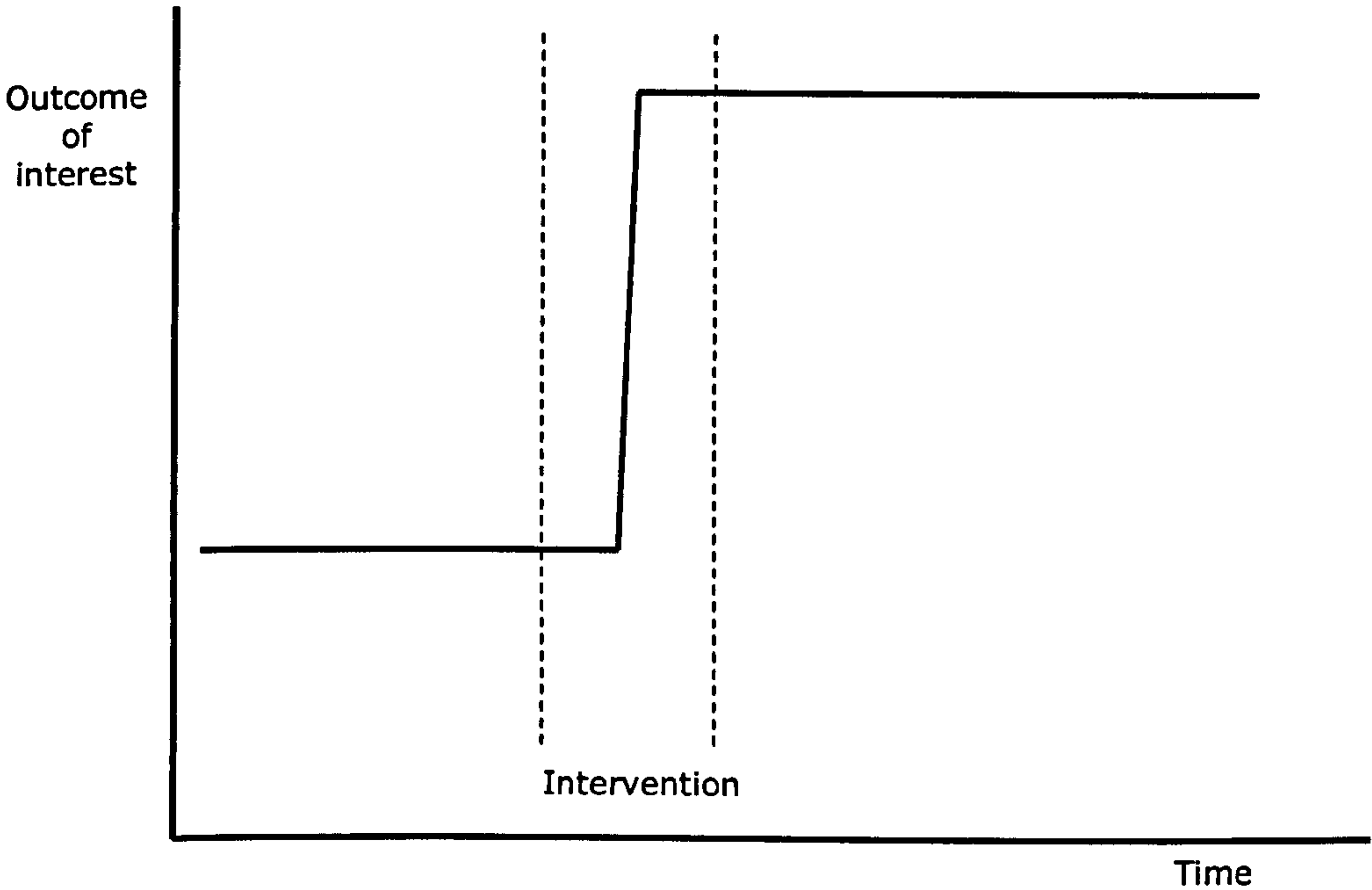


Figure 21 - Intervention associated with a small rapid initial increase then continuing increases in an outcome over time (adapted from Glass)¹⁸⁴

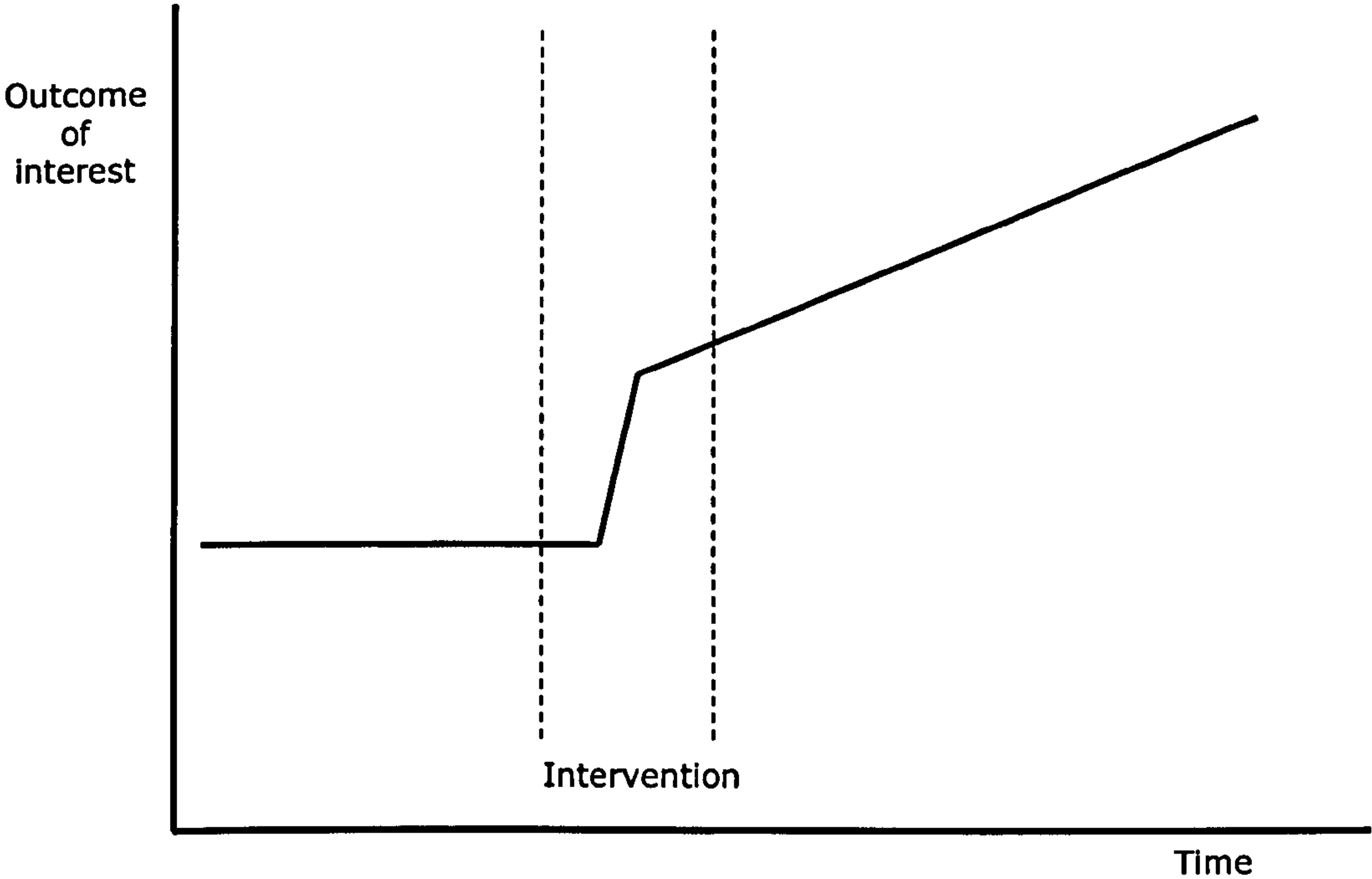


Figure 22 - Intervention associated with a diminishing increase in an outcome over time (adapted from Glass)¹⁸⁴

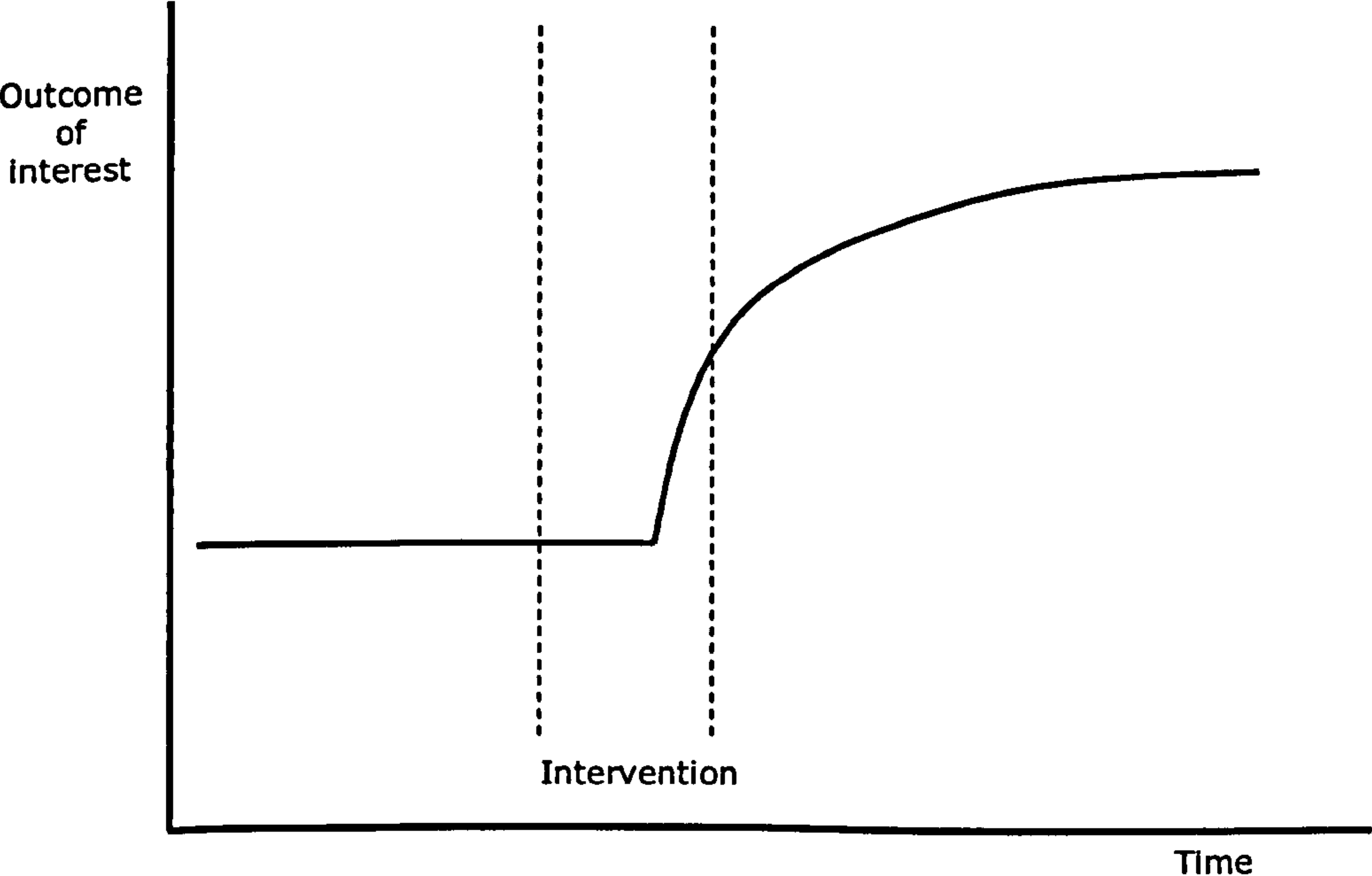


Figure 23 - Intervention associated with a rapid increase in an outcome followed by a gradual decline (adapted from Glass)¹⁸⁴

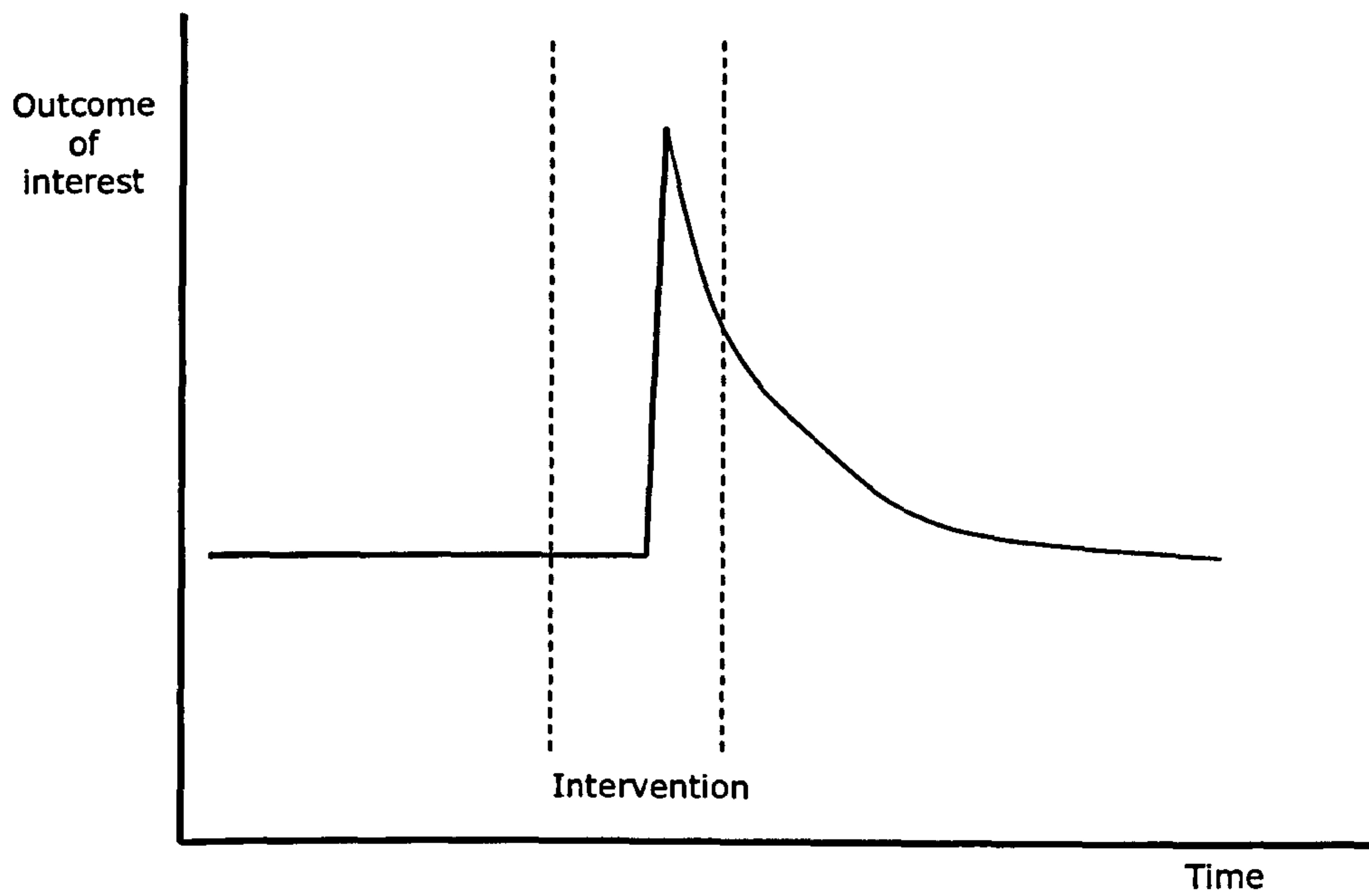
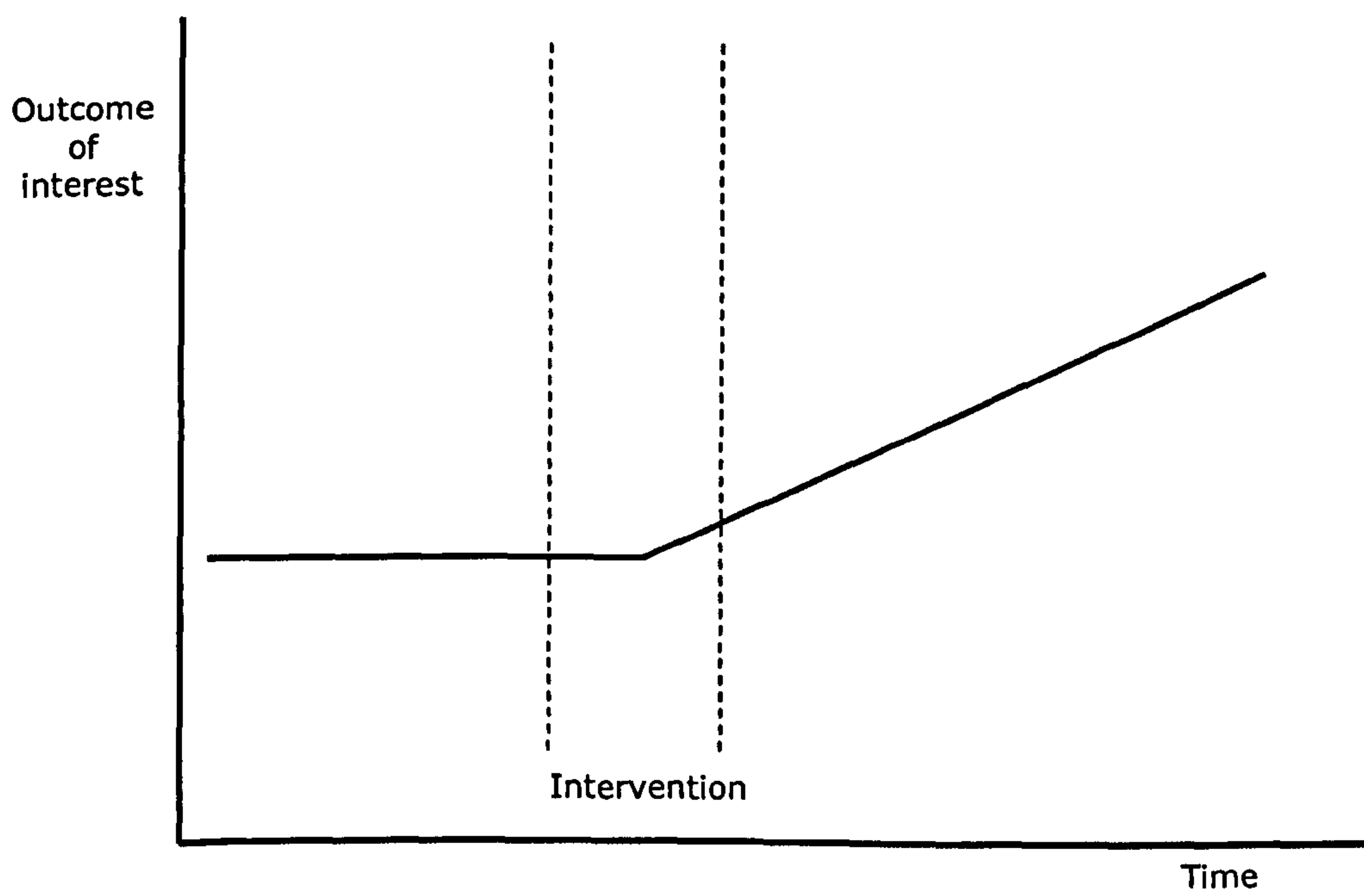
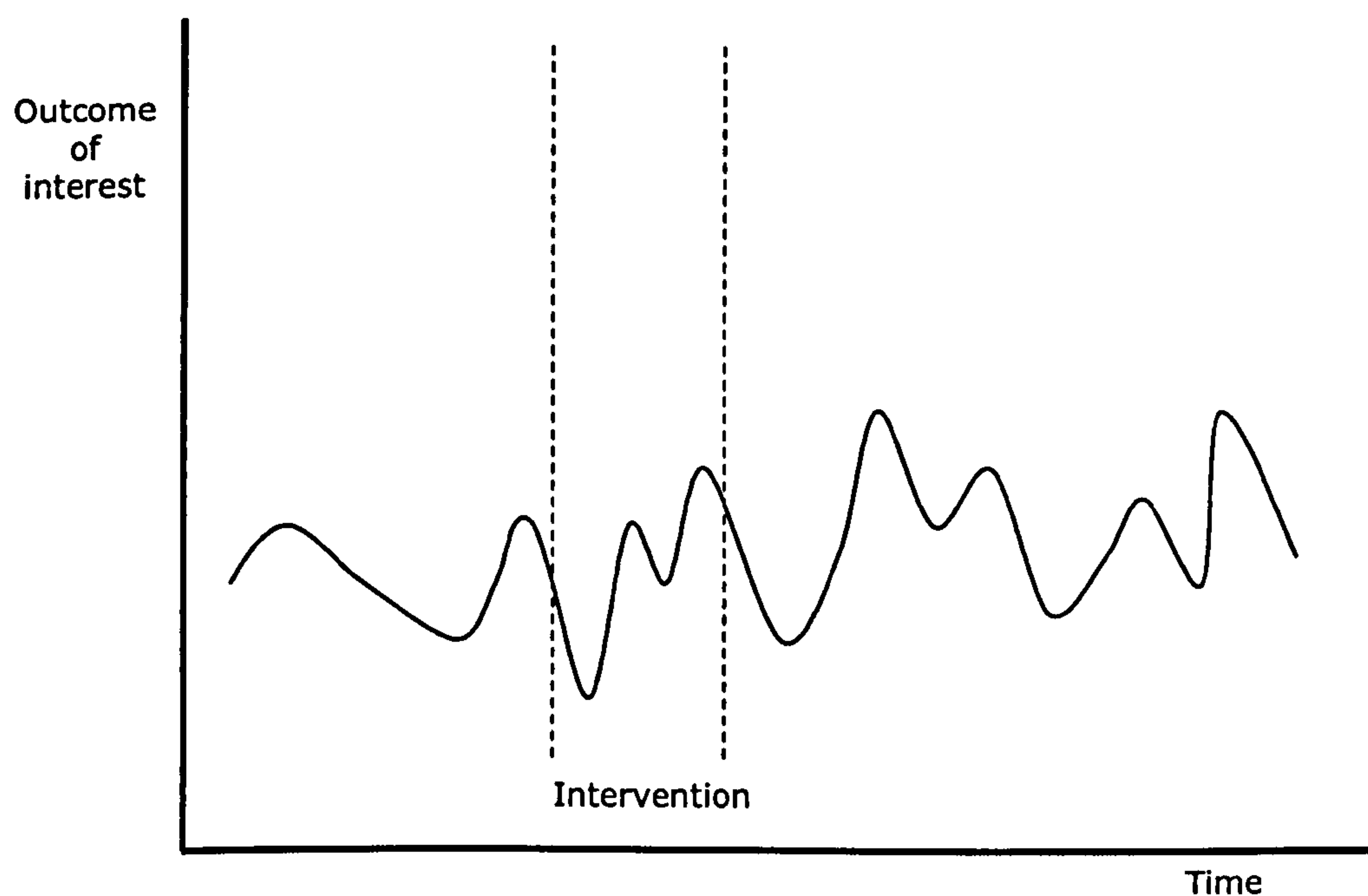


Figure 24 - Intervention associated with a steady continuous increase in an outcome (adapted from Glass)¹⁸⁴



Rarely are such clear patterns observed in reality. It is not uncommon for there to be a trend (either stable, increasing or decreasing) with some noticeable daily, monthly or annual variability and a small deflection in this trend at the time, or shortly following, the time of the intervention (for example Figure 25).¹⁷⁷ This does not invalidate the method, but makes the attribution of any effect to the intervention difficult.

Figure 25 - A more typical interrupted time series¹⁸⁴



One addition that can improve the ability of such studies to attribute change to the intervention is where another trend can be observed in a population not exposed to the intervention. If the trends diverge following the intervention between the exposed and non-exposed groups this adds to the validity of any assertion of a true association as opposed to a simple secular trend.

Realistic evaluation

Realistic evaluation has been proposed by Pawson and Tilley as a means to discover what works, for whom and in what circumstances.^{76, 186} It is not a specific method in itself, but more of an approach which seeks to answer these questions using a range of other research designs. Its strength is in understanding how projects or programmes work (if they do), by examining the theory and reality of how the programme interacts with existing systems.⁷⁶ Key to the approach is a more flexible framework in which numerous nested studies, both qualitative and quantitative, are set up during the period of the intervention to test hypotheses as they arise. It is based on the premise that it is difficult to know who benefits from interventions and in what contexts this will happen, even where the overall effect size is known from previous studies. These evaluation challenges are particularly important when the complexity of the intervention increases, and is therefore relevant to the evaluation of the Games. Using different language, Eoyang and Berkas argue that the features of complex adaptive systems require intervention evaluations to develop theory, design the evaluation iteratively as information becomes available, use feedback to identify hypotheses and use time series analyses to identify emergent properties.¹⁸³ These are all features of realistic evaluation models.

Despite these advantages, realistic evaluation does not offer a solution to the question of whether or not an intervention has a particular effect: it has no additional power or freedom from bias than any other study design. Furthermore, its lack of focus on such a quantitative analysis leaves it vulnerable to silence on the question of the degree of impact instead offering information on who was impacted and why.⁸⁴

Input-output economic models

The systematic review highlighted that one of the most prominent methods of evaluating the economic impacts of major sports events in the past has been the input-output (IO) model. The IO model is a useful tool for calculating the economic impact of economic 'shocks': that is the impact of changes in complex economic system caused by the external application of an economic force. For example, if a transnational corporation makes a decision to build a factory in a region, an IO model can be used to calculate the impact of this intervention.

It works by counting the additional capital inserted into the economy (or conversely the additional capital lost to the economy) and then modelling how this additional capital travels through the economy, counting the impacts at each stage. This is predicated on the concept of the 'multiplier effect', which is the amount of additional impact that the new capital generates as it travels through the economy. This multiplier effect is greater where the economy is more self-reliant (and therefore has lower imports), and where the capital is distributed to those who are most likely to spend it.

There is one particular caveat in how such IO models should be used, and one considerable drawback with their usefulness. The caveat is that if the economic shock is not external to the economy then the opportunity cost of the shock has to be accounted for. This is because the capital added to the economy is capital that has, by definition, been taken from elsewhere in the economy. Second, IO models do not take into account the complexity of the economy with respect to inflation and monetary policy responses.

The economic evaluations using IO models identified in the systematic review (Chapter 5) have also been particularly limited by the use of estimated data. This is partly because of the timing of these studies (usually published a matter of months following the conclusion of the event), which precludes the gathering of data on the economic trends following the event. This means that estimates for crucial elements in the model, such as the long-run impact on the arrival of international tourists to the host city, are based on nothing more than an estimate. This is likely to explain the large discrepancy between the regression-based economic models that use actual collected data (and show little or no positive economic impact) and the IO models using estimated data (that often predict large positive impacts).

Major sports events are a mix of an internal financial redistribution between sectors and an external economic shock. The internal redistribution arises from the infrastructure built using government or city council funds (or funds generated from other domestic sources such as a lottery) and other domestic spending associated with the event. The external shocks might arise from additional tourism spending, transnational corporate sponsorship or increased trade. The use of IO models to evaluate the impact of major sports events has to account for the opportunity costs associated with the use of domestic capital, a cost that has been conspicuous by its absence in their previous use for this purpose.

Computable General Equilibrium (CGE) economic models

CGE models are similar to IO models with the exception that the economic shock data is entered into a much more complex model of the relevant economy. These models are created using historical data from the economy in question and are adjusted to maximise the ability of the model to explain variation in economic

performance. For example, the Fraser of Allander Institute at Strathclyde University has built a model of the Scottish economy which has been used to model the impact economic shocks such as the expansion of Glasgow Airport.¹⁸⁷ The ability of the CGE model to account for impacts on inflation and the complexities of the economy give this design of model an advantage over the IO design.

However CGE models, like IO models, are vulnerable to the accuracy of the data which are used to calculate impacts. The CGE models identified in Chapter 3 to evaluate the economic impact of major sports events again are prone to the use of estimated data and omitted opportunity costs. This is a common problem with CGE models, even outwith the context of major sports events.¹⁸⁸⁻¹⁹⁰

CGE models of economies, because they are built to explain past variations in economic performance, are also subject to the 'narrative fallacy': the assumption that the economy will perform in the future in the same manner as it has in the past. Often this is true, particularly for phenomena that can be described using the normal distribution. However, the economy can be subject to rapid and very large changes in its status which are not expected. For example, a CGE model examining the impact of the move by some US banks into 'sub-prime' lending would not have been able to predict the threshold effect that was witnessed as the global economy rapidly descended into recession. The CGE model, although more sophisticated than the IO model, cannot account for such changes which will occasionally occur because of this narrative fallacy.

7.5. Evaluating the 2014 Games

In Chapter 6 the different types of impact of major sports events were described: direct impacts; catalytic effects; and 'project effects'. This classification is useful when considering the mechanisms through which the event might result in changes in health and social outcomes, and by extension, in considering how such effects might be measured and evaluated. 'Project effects' are considered first here because these are most amenable to the traditional methods found in the evaluation literature. In contrast, the direct impacts of major sports events are more complex and less linear than the project effects and more diffuse in their reach to different populations. These impacts therefore represent a greater challenge for evaluators. The catalytic effects are more difficult again to measure and quantify, and require a distinct approach to the 'project effects' and direct effects.

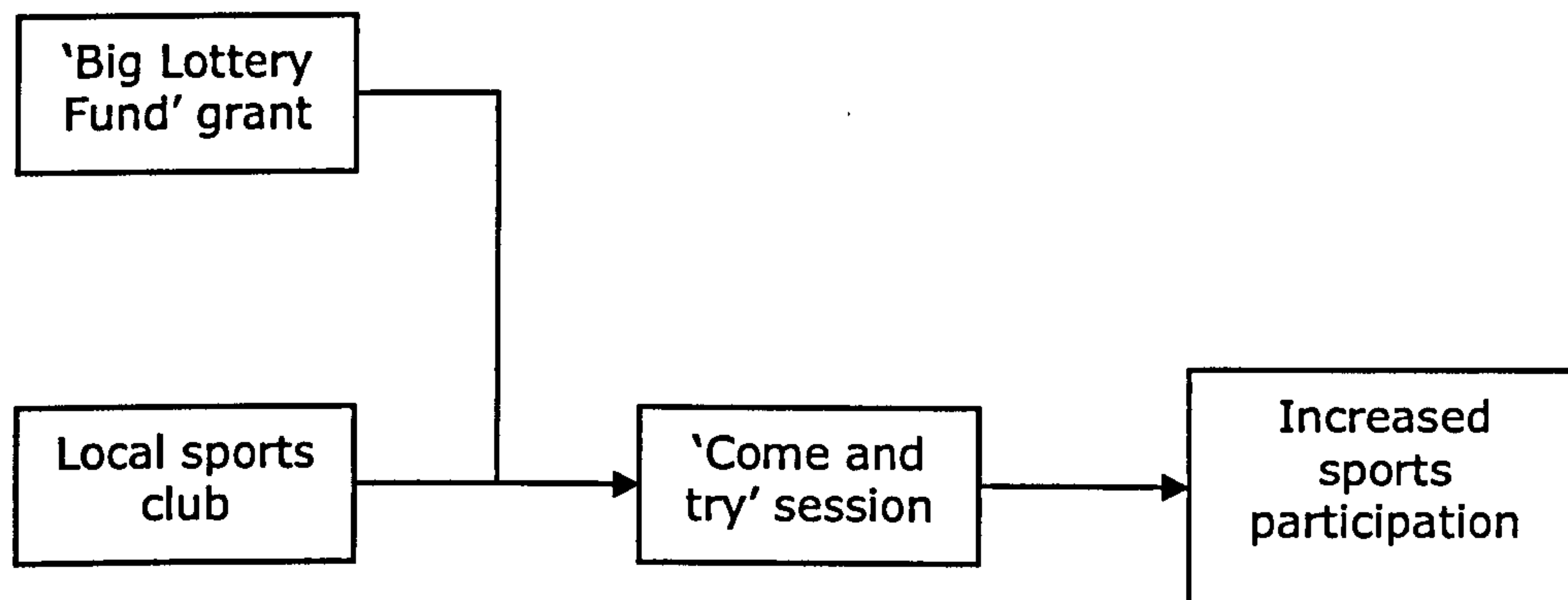
Evaluating the 'project effects' of major sports events

Project effects are those which arise from distinct programmes and projects which are associated with major sports events. These programmes and projects seek to utilise the context of the major sports event but the event is in no way dependent on their occurrence, and it is possible to imagine these programmes and projects being implemented in a similar form in the absence of an event.

Although all interventions are to a degree complex, these 'project effects' are least complex since they have a single active ingredient and a minimal 'knock-on' effect to other systems and outcomes. They are generally amenable to logic modelling or a simple 'theories of change' approach, and the underlying logic is usually linear. An example of this would be the '2014 Communities project' which

provides grant monies (derived from National Lottery receipts) to community organisations to run participation events (Figure 26).¹⁹¹

Figure 26 - Theory of change associated with a typical 'project effect'¹⁹¹



Due to the specific, defined and linear nature of the theory of change associated with this project, numerous traditional evaluation methods are applicable. These methods can be divided into process evaluation methods (i.e. those which seek to evaluate whether or not the project was implemented in the intended way) and outcome evaluation methods (i.e. those which seek to evaluate whether or not the project had the desired impact on the outcome of interest such as sports participation or health). Both types of evaluation are important if learning is to be gained from the intervention. This is particularly the case when the desired change in outcomes is not seen, a phenomenon that could be due either to a failure to implement the intervention in the desired manner or a failure of the intervention to have the desired effect.

It is possible that the interventions likely to generate project effects could be randomised. There is no indication that this is being considered for the 2014 Games and so only the observational methods of evaluation are considered below.

The best quality evidence for project effects would be obtained from a cohort study in combination with a process evaluation (and possibly qualitative evaluation to identify why the intervention led to the outcomes observed). However, the feasibility of this approach is determined by:

- The availability of a sample frame prior to the intervention to allow pre-intervention data collection
- The ability to identify a comparison group that is similar to the exposed group to evaluate the counterfactual
- Sufficient funding to allow adequate recruitment and retention of study participants

This is unlikely to be the case for most of the interventions which might be expected to generate ‘project effects’, since they will not be targeted to a small population from which a large proportion would be expected to take part (or be exposed). Instead, the dominant recruitment pattern of these interventions is likely to involve a small proportion of a large population. Thus, it would not be possible to follow-up sufficient numbers of study participants such that enough would be exposed to the intervention.

Where this is the case, the most suitable design is likely to be a retrospective cohort study, where a sample of individuals exposed to the intervention can be compared with others that have not been. The dangers of recall bias with respect

to the exposure could be minimised if a record was kept of all individuals exposed and permission was sought from study participants to check their exposure status using these records. However, care would still require to be taken to recruit a suitable comparison group in the cohort design, something made easier if there is a common population from which the exposed and non-exposed groups can be drawn (e.g. area of residence). This would provide an affordable but useful quantitative analysis of such interventions. It would still require complementary process evaluation and qualitative work to ensure that an understanding is gained of why the intervention had the observed impacts.

Evaluating the direct impacts of major sports events

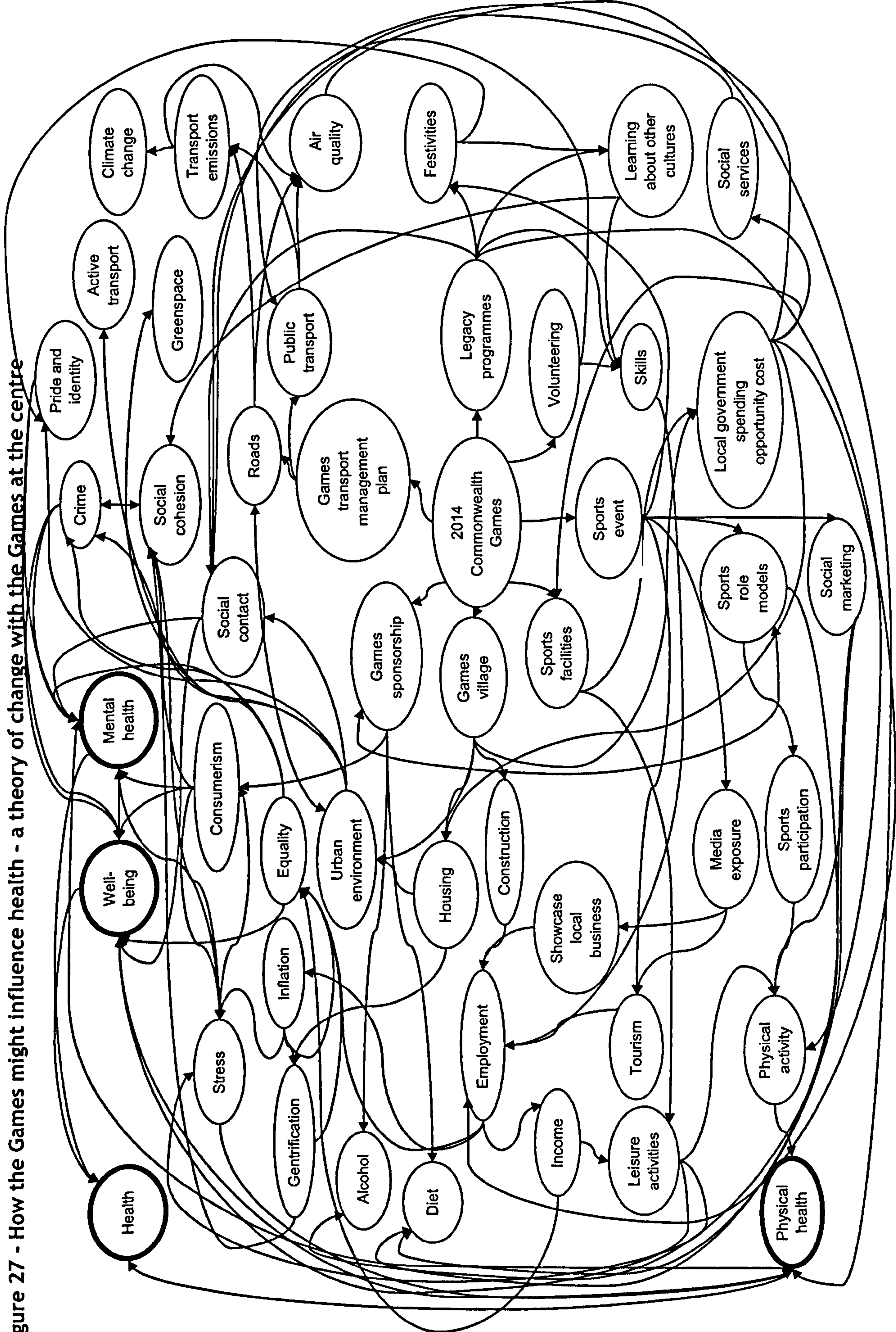
The direct impacts of major sports events are those which arise from integral components of the intervention which are not easily implemented at other times outwith the context of a host city, and which are essential or inevitable consequences of playing host. As such they can be considered as the common impacts which could be expected of similar events. These impacts are also those which have been most rigorously researched (as demonstrated in the systematic review in Chapter 5).

The type of simple modelling used in assessing the 'project effects' is not possible for many of the direct impacts of major sports events. This is principally because of the complexity of the intervention, its non-linearity, its interaction with numerous other systems and processes and the often distant relationship between the intervention and the outcome of interest. As an illustration of the complexity of these direct impacts, I created a more complex theory of change for the direct impacts of the 2014 Commonwealth Games (Figure 27). It has at its centre the 'intervention' that is the Games with all the direct impacts of this emanating out

from it. The links between the event, the immediate consequences of the event, and the more distant (and often more tenuous) outcomes of the event are all at this stage theoretical. That is to say that the links have either been postulated by the Games Organising Committee,¹ Government^{47, 148} or the City Council,¹⁵⁵ or have appeared in the academic^{49, 50, 56, 67, 192-198} or lay literature.¹⁹⁹⁻²⁰²

Despite this complexity, the direct impacts of major sports events are more amenable to most of the traditional epidemiological methods than the catalytic effects.

Figure 27 - How the Games might influence health - a theory of change with the Games at the centre



Although these direct impacts have been evaluated in historical major sports events more often than project effects or catalytic effects, the systematic review (Chapter 5) highlighted that the quality of this research was limited. The main limitations to the quality of the available literature are summarised in Table 4, along with some possible improvements that could be made to future research of these impacts.

Table 4 - Means to increase the quality of the evidence base on the direct impacts of major sports events

Direct impact	Quality limitation in studies included in the systematic review	Potential methods to improve study quality
Health, recreation, transport, environment, crime	<ul style="list-style-type: none"> • Inability to attribute effects because of cross-sectional design and lack of contemporaneous comparison group 	<ul style="list-style-type: none"> • Longitudinal (cohort) study • Define and include a non-exposed group with similar characteristics for inclusion in the longitudinal study as a comparison (control) group
	<ul style="list-style-type: none"> • Proxy outcome measures dominant (e.g. health care demand) 	<ul style="list-style-type: none"> • Include the outcome measures of interest
	<ul style="list-style-type: none"> • Lack of theory or intermediate measures to allow determination of why outcome measures did or did not change (with exception of transport and environment studies) 	<ul style="list-style-type: none"> • Create a theory of change to develop measures at each step of the theoretical pathway • Include process measures to evaluate the implementation of the intervention
	<ul style="list-style-type: none"> • Limited time frame of analysis 	<ul style="list-style-type: none"> • Use an appropriate time frame for the outcome
Volunteers	<ul style="list-style-type: none"> • Lack of theory or intermediate measures to allow determination of why outcome measures did or did not change 	<ul style="list-style-type: none"> • Create a theory of change to develop measures at each step of the mechanism • Include process measures to evaluate the implementation of the intervention
	<ul style="list-style-type: none"> • Lack of quantitative outcome measures 	<ul style="list-style-type: none"> • Include the outcome measures of interest
	<ul style="list-style-type: none"> • Bias in sampling 	<ul style="list-style-type: none"> • Use an alternative to postal recruitment of study participants (e.g. recruit directly at volunteer events)
	<ul style="list-style-type: none"> • Limited time frame of analysis 	<ul style="list-style-type: none"> • Use an appropriate time frame for the outcome
Cultural	<ul style="list-style-type: none"> • Inability to attribute effects because of cross-sectional design and lack of contemporaneous comparison group 	<ul style="list-style-type: none"> • Longitudinal (cohort) study • Define and include a non-exposed group with similar characteristics for inclusion in the longitudinal study as a comparison (control) group
	<ul style="list-style-type: none"> • Lack of theory or intermediate measures to allow determination of why outcome measures did or did not change 	<ul style="list-style-type: none"> • Create a theory of change to develop measures at each step of the mechanism • Include process measures to evaluate the implementation of the intervention
	<ul style="list-style-type: none"> • Limited time frame of analysis 	<ul style="list-style-type: none"> • Use an appropriate time frame for the outcome

Economic	<ul style="list-style-type: none"> • Lack of theory or intermediate measures to allow determination of why outcome measures did or did not change 	<ul style="list-style-type: none"> • Create a theory of change to develop measures at each step of the mechanism • Include process measures to evaluate the implementation of the intervention
	<ul style="list-style-type: none"> • No account taken of opportunity cost 	<ul style="list-style-type: none"> • Account for the opportunity costs within the economy
	<ul style="list-style-type: none"> • Limited time frame of analysis 	<ul style="list-style-type: none"> • Use an appropriate time frame for the outcome
	<ul style="list-style-type: none"> • Predominant use of estimated data 	<ul style="list-style-type: none"> • Use collected data instead of estimated data
Business	<ul style="list-style-type: none"> • Lack of theory or intermediate measures to allow determination of why outcome measures did or did not change 	<ul style="list-style-type: none"> • Create a theory of change to develop measures at each step of the mechanism • Include process measures to evaluate the implementation of the intervention
	<ul style="list-style-type: none"> • Lack of quantitative outcome measures 	<ul style="list-style-type: none"> • Include measures for all relevant outcomes
	<ul style="list-style-type: none"> • Limited time frame of analysis 	<ul style="list-style-type: none"> • Use an appropriate time frame for the outcome
Tourism	<ul style="list-style-type: none"> • Lack of contemporaneous comparison groups 	<ul style="list-style-type: none"> • Longitudinal (cohort) study • Define and include a non-exposed group with similar characteristics for inclusion in the longitudinal study as a comparison (control) group
	<ul style="list-style-type: none"> • Limited time frame of analysis 	<ul style="list-style-type: none"> • Use an appropriate time frame for the outcome

Several methodological themes can be seen in Table 4 that are common to each of the direct impacts. These are the need for:

- Longitudinal studies of groups of individuals
- Contemporaneous comparison groups of individuals who are not exposed to the intervention
- The use of a theory of change to identify intermediate measures in the mechanisms of impact
- An appropriate time frame for the study
- Accounting for opportunity costs

- The use of actual, rather than estimated, data

These methodological shortfalls are not uncommon in the evaluation of social interventions because addressing them incurs significant costs, requires prolonged follow-up periods and advanced notice of the implementation of the intervention. Major sports events have the potential to attract sufficient research funding for studies of this nature and duration because of the intense interest in their ‘legacy’ impacts.^{45, 47, 200} Furthermore, the exact date of their implementation (notwithstanding the difficulties in defining which periods of time are relevant to the exposure of populations to particular mechanisms of the intervention) is known years in advance.

It is clear that a cohort study, involving individuals most likely to be exposed to these direct impacts (principally those living in the environs of the Games village who are likely to be exposed to the greatest number of pathways) and a comparison group(s) of individuals from areas not likely to be significantly exposed to the intervention would provide the highest quality evidence for a quantification of the total direct impact of the event. However, unlike with the ‘project effects’, defining who has been exposed is much more difficult, and it is likely that most individuals in the country will be exposed to some aspect (even if this is only to the associated social marketing campaigns). A cohort study therefore requires careful consideration of the recruitment of non-exposed individuals who are similar to the exposed population.

Recent work by David Walsh of the Glasgow Centre for Population Health has identified small areas in the cities of Liverpool and Manchester with a similar deprivation profile to the most deprived small areas in the East End of Glasgow (in

relation to research project investigating the 'Scottish Effect' - the excess mortality found in Glasgow after the effects of deprivation are accounted for).¹⁶ Walsh has also identified matched affluent areas in the 3 cities.²³ This type of work, which identifies areas with matched socioeconomic conditions to the geographical communities of interest in Glasgow, could be used to generate a sample frame from which a cohort could be recruited several years before the event. This has the potential to utilise research-specific data (relating to the degree of exposure, health status and socio-economic features) as well as to link to routine sources of data (such as GP primary care data, hospital data etc.).

Despite these obvious advantages, there are a number of drawbacks to such a proposal. First, such a study would be costly and take many years of work to generate results. It might be possible to use existing cohort studies for this purpose (e.g. the Twenty-07 cohort in Glasgow²⁰³ or the GoWell study of regeneration in Glasgow²⁰⁴), but it would also require the identification of cohorts in non-exposed areas (such as Liverpool) and the addition of questions in each of these cohorts at comparable time intervals to allow the direct impacts to be evaluated. This is an unlikely proposition. Second, even where areas are identified to provide comparable sample frames in terms of socio-economic and health outcomes, the exposure is difficult to define and measure for the groups. A simple trichotomy of Glasgow, Manchester and Liverpool (for example) misses the fact that Manchester hosted the Commonwealth Games in 2002 and Liverpool the City of Culture in 2008. Furthermore, the very neighbourhoods identified by Walsh as being most comparable in Manchester were those in which the new stadia for the Manchester Commonwealth Games were constructed.²³ Thus, defining the exposed and non-exposed areas, even when taking areas beyond Scotland, runs the risk of significant confounding influences. The very nature of deprived communities attracts

numerous interventions across the determinants of health (e.g. regeneration and housing initiatives). Although the presence of these could be measured, a cohort would require a variation in these exposures between its study participants which might not be found with such a sample frame. A sample frame for the comparison areas not matched by deprivation will simply not yield the similarity required for the evaluation of the independent effect of the Games.

The alternative evaluation method to the cohort study is a repeat cross-section (i.e. the use of routine data in an ecological study). This was the most common method used to evaluate previous events (as discussed in Chapter 3). This is a cheaper study design which can be performed retrospectively using routinely collected data (such annual Government-funded cross-sectional surveys).

Importantly, it can simultaneously compare the entire population and, particularly for the direct effects that are mediated by area of residence, can provide sufficient comparison to allow the counterfactual to be evaluated. However, the inability to determine exposure is its downfall. As there are no individual data an assumption has to be made to link the direct impacts with any changes observed in the population. For example, if the mean wealth of the small areas surrounding the Glasgow Games venues was to increase around the time of the event, what would that mean? It could mean that the resident population has gained from the event through increased employment which has raised their income. Alternatively it could represent rising rents which have displaced the original residents to other areas of the city and attracted wealthier tenants to the area. An ecological study is unlikely to be able to disentangle such impacts.

It is for this reason that a cohort study is the best option for evaluating the direct impacts of the Games, again in combination with a process evaluation and

qualitative work to identify why the observed impacts occur. There are three additional aspects to the evaluation of the direct impacts which are discussed below.

Evaluating the economic impacts

Although a cohort study could evaluate the economic impact of the event on the sample of individuals, it would not allow the overall impact on the economy to be evaluated. Three evaluation models have been utilised in evaluating the economic impacts of previous events: regression models, IO models and CGE models. The quality of the IO and CGE models could be improved using actual data collected until several years after the event (instead of estimates), and if the opportunity costs were accounted for. In short, any economic evaluation done without recourse to actual data will be limited to a discussion of what is predicted to occur to an economy rather than what actually occurred. It has also been discussed that the IO model does not account sufficiently for the complexity of the economy and the CGE model is vulnerable to the narrative fallacy. In contrast to the IO and CGE models, a regression analysis seeks to examine whether there are differences in the routine economic statistics between areas as part of an ecological analysis. It struggles to account for all possible confounders and can only detect relatively large differences between the host and the comparison areas. Regression analysis using ecological data has less danger of creating spurious results but may only detect a large economic impact from the event. This is probably the most valid methodology but may not fulfil the requirements of the organising committee to precisely evaluate the net economic impact.

Ensuring the scope of possible direct impacts is evaluated

The systematic review (Chapter 5) highlighted that previous studies had evaluated only a limited number of outcome measures for the possible range of direct impacts. For example, in terms of health outcomes, only suicide has been evaluated in previous events with proxy measures for other health outcomes (such as hospital admissions data). A cohort study allows numerous outcomes to be evaluated since it starts with a group of exposed individuals (ideally with a comparison group of non-exposed individuals). However, such a study is limited to the evaluation of outcomes at an individual level which could not then describe the direct impacts at societal level (the so-called atomistic fallacy).¹⁸² Ecological studies can do the reverse: they can evaluate a range of outcomes (using routinely collected data) at a population level without being able to make any inferences for individuals. Each of these study designs therefore has a role to play in evaluating the Games.

Identifying a critical pathway

The purpose of a process evaluation is to learn about whether an intervention is implemented as expected, and to understand why an intervention is implemented in the way it is. This, of necessity, requires quantitative measures and qualitative study. In many interventions the process evaluation can be relatively simple: measuring the reach (i.e. the number of individuals affected by the intervention and how they were affected), conduct (e.g. the number of sessions run or the number of hours a facility was open), and proximal outcomes (e.g. the number of individuals completing a course). The process evaluation for the elements of the Games that generate project effects (e.g. a come-and-try sports intervention) could be designed in this simple way. For the other direct impacts of the Games, a process evaluation is much more difficult, as the pathway between the

intervention and the outcomes (even the more proximal ones) is complex (Figure 30). It is therefore very difficult to enumerate the reach, conduct and proximal outcomes for these direct impacts.

Despite this difficulty, it remains key to perform a process evaluation for these expected direct impacts so that it is possible to learn, if no change in the outcome measure is detected, whether or not this is due to how the intervention was implemented. For example, one of the direct expected impacts of the Games is increased employment. The theory suggests that this will arise from new construction jobs related to the building of new sports venues, but also from increased trade due to increased international exposure, and a variety of other mechanisms. If employment does not increase, it is not possible to say whether or not this is simply not a valid direct effect of the Games (if for example, the opportunity costs of creating that employment offset any job creation due to infrastructure construction) or because the intervention didn't occur as planned (e.g. if the construction of several venues was cancelled resulting in lower than expected job creation through this route).

Hawe and colleagues have argued that, in the context of testing the effect of an intervention, it is less important to standardise all aspects of the intervention and instead it is better to focus on identifying the critical features of the intervention and then allow the detail to be designed locally without demands for fidelity.⁸³

Another version of this idea might be to identify the 'key ingredients' of an intervention as a means to focus the process evaluation of a complex intervention which is proposed to have a large number of direct impacts. This has similarities with 'critical pathway analysis' which is commonly used in industry and in developing efficient processes within health care systems.²⁰⁵ It also links with the

'theories of change' approach which has been used throughout this thesis to describe the various proposed mechanisms through which the Games might generate health and social impacts.

The advantage of this method is to focus the process evaluation on the most likely, and indeed critical, mechanisms through which the impacts are proposed to occur. However, it relies upon correct theory if such 'key ingredients' are to be investigated (i.e. if there was an alternative mechanism through which such an impact might occur without change in the critical pathway). Furthermore, there is no provision for this approach to identify unexpected or emergent impacts.

Evaluating the catalytic effects of major sports events

The nature of catalytic effects of major sports events was best expressed by Steven Purcell, the former leader of Glasgow City Council, when he said, "We believe that by using the excitement and "glitter" of the Games, we can get more out of existing resources to deliver a legacy".⁴⁷ This concept is quite different from 'project effects', where the population exposed to the intervention can easily be defined, or to direct effects, where the theory of change can be mapped out (albeit in a complex and almost infinite system) and appropriate methods applied. Catalytic effects however suggest that 'the whole is greater than the sum of the parts'. That is to say that no matter how complex the theory of change becomes to delineate the potential and actual mechanisms of action, there is an additional effect where the underlying context is changed.²⁰⁶ In this way, without an additional expenditure or change in policy or programmes, outcomes are changed because of the ability of the event to effect how existing processes operate.

This clearly poses a problem for evaluators. It is not clear who or what is exposed, and it is difficult to delineate exactly what the expected impacts might be or when they may occur. At one level, it is as if there is a 'magical' effect that is expected to occur which cannot be imagined or planned for, yet is expected to appear as the planning and hosting of the event unfolds. Yet at another level it is a perfectly rational proposition that the event may generate changes in culture or attitude in the host population, public sector, private sector, and even in those outside the host city (particularly about how they perceive the host city). It is more possible to propose mechanisms and outcomes for this latter proposition (as with the 'project effects' and direct effects) than for the former. It is therefore simpler to design an evaluation to capture such impacts if they are seen. The former impacts are more akin to the unplanned, unexpected and emergent impacts that require particular evaluation techniques. These are discussed in the next section.

Known knowns, Unknown knowns, Known unknowns and Unknown Unknowns⁵⁵

Horne has described the impacts of major sports events using the maxim made famous by Donald Rumsfeld:

“There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we now know we don't know. But there are also unknown unknowns. These are things we do not know we don't know” (Donald Rumsfeld, then US Secretary of State for Defense (sic), 2002)

This encourages critical thought on the impacts of major sports events which we are confident we know; impacts that we have identified that we do not know (but have some awareness of this gap in our knowledge); impacts that we think we do not know but in fact there is sufficient knowledge available which is either ignored,

suppressed or forgotten; and finally there are the impacts that we are unaware that we do not know about - the most unpredicted of all. Horne suggests that there are several impacts of major sports events that fall into the second of these categories (unknown knowns).⁵⁵ The systematic review (Chapter 5) suggests that there is a body of evidence, albeit of low quality and using a variety of largely incomparable outcomes, which taken together casts doubt on the ability of major sports events to generate positive impacts on those aspects which have been researched (e.g. the impact on the economy). However, the systematic review can only, by definition, synthesize evidence from the available literature. Where impacts have occurred that have gone unresearched, perhaps because of their unexpected nature, or because of delays between the intervention and the outcome, or because of a lack of interest or funding, they will not have been included in the review synthesis.

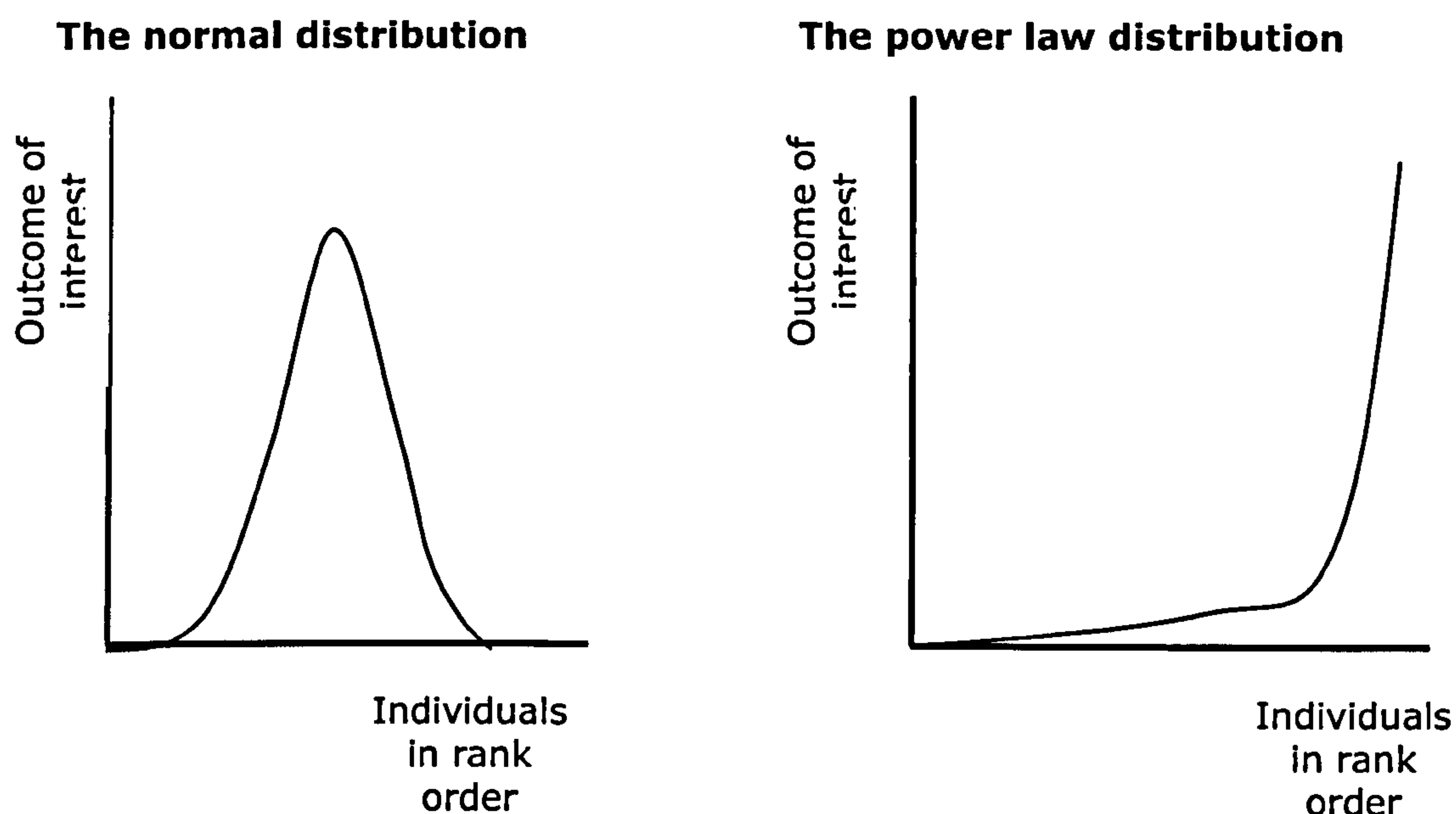
The complex nature of major sports events has already been discussed. Complex systems have properties which include emergence. Emergence is when the individual components of an intervention reach some 'tipping point' and create a change which is out of proportion to the scale of the original intervention(s). It is a phenomenon that is difficult to predict, difficult to direct, and may be difficult to attribute to the intervention.¹⁷⁸

The most likely type of intervention which might generate emergent effects are those which create or destroy the 'order generating rules' (OGRs) in society.²⁰⁷ These rules are the laws, conventions and cultural norms that determine group behaviour. For example, an OGR in the health care system is that the GP is ultimately responsible for the care of their patients whilst in the community. This generates and guides a huge amount of health care activity in a particular manner

without recourse to a plethora of other rules and regulations. If the GP's responsibility was taken away this would fundamentally change the behaviour patterns in primary care without any other changes in this complex system. It is difficult to see where a new OGR might be created from a major sports event or an existing one destroyed. Therefore emergent effects are less likely from 2014 Games.

Taleb has used a different metaphor to describe a similar phenomenon.²⁰⁸ His thesis divides phenomena found in society and nature into two types: those which can be described by Gaussian normal distribution curves; and those which cannot and are more easily described by the power laws. For example, the height of human adults is best described by a normal distribution since there is a clear mean height and the presence of outliers does not influence the overall mean. Many other phenomena, for example the distribution of wealth within society, are not easily described using a normal distribution. This is because the presence of a single outlier can substantially alter the mean value. This is crucial because the occurrence of such an outlier cannot be predicted from a dataset unless it is realised that a power law (rather than a normal distribution) is at play (Figure 28).

Figure 28 - Normal distribution and power law distribution



In the context of major sports events, one has to consider whether or not the distribution of impacts is likely to be normal (and therefore able to be predicted from previous events) or likely to be subject to substantial outliers. For example, does the evidence from previous events on economic impacts (of little or no economic growth) suggest that the mean impact across events will not be affected significantly by new data arising from future events? Or is it possible that, despite there being little or no economic growth arising from previous events and a mean of approximately zero, a future event will substantially alter this figure because of a very large economic impact (a difference of several orders of magnitude in either a positive or negative direction)?

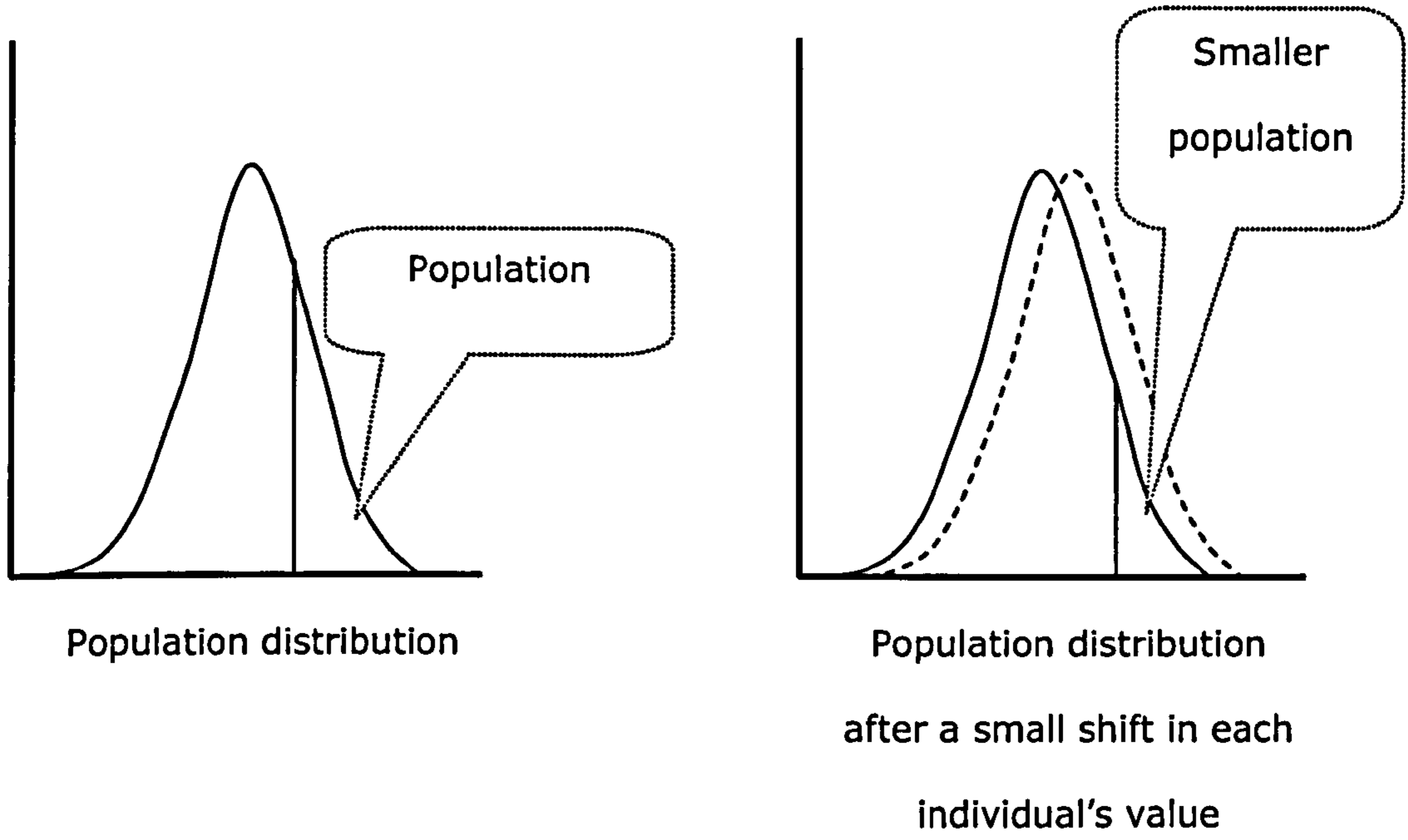
It seems clear that such interventions (major sports events) can be described in terms of a normal distribution (in terms of economic, health and social impacts). The type of 'interventions' that do not fit this distribution might be phenomena such as a natural disaster (consider the economic impact of Hurricane Katrina on New Orleans) or the discovery of natural resources (e.g. the discovery of oil in the

Arab Emirates). Major sports events are unlikely to change the 'order generating rules' of the city, nor is an extreme impact (as might be found with a power law distribution) consistent with how it is understood major sports events create impacts. That said, the excessive public debt currently being served by the Greek government was exacerbated by the hosting of the 2004 Olympic Games in Athens. It could have been that the Games meant that a crucial 'tipping point' was reached such that an emergent outcome occurred.

If emergent impacts, arising from the interaction of the intervention with a complex system, arise, this will create a significant problem for evaluators. Not only would there be direct effects, project effects and expected (or at least hoped for) catalytic effects of major sports events, there would be the potential for emergent impacts which may be subtle, unpredictable, yet important.

Despite this potential for emergent impacts, the theoretical impacts which are being considered for the event suggest that they will not occur. At best (or worse) a small change affecting a large proportion of the population might occur (in keeping with the Rose hypothesis of how a small change in the distribution of a phenomenon across a society might have a large effect for a population with only a very small impact on each individual (Figure 29)) or an underlying trend might be exacerbated by playing host (as in the example of Greek public debt).¹⁷⁸

Figure 29 - How a change in the population distribution can have population impacts



7.6. Results - Summary of the best evaluation approach for the 2014 Games

As discussed in the previous section, one of the main challenges for the evaluation of the Games is in the recruitment of an appropriate comparison group that might allow any changes in the outcomes of interest to be attributed to the event (i.e. to allow some causal inference to be made). It is also very difficult to identify which individuals are exposed to the effects of the Games (except in relation to the project effects, although even with these it is difficult to predict in advance who is likely to be exposed to such project effects) and which periods of time constitute the exposure (e.g. the construction period, the days of the event). There is also the suggestion that the Games will generate catalytic effects (where the ability of current policies and interventions to generate outcomes is enhanced) and, due to its complexity, might generate emergent effects (although it has been argued here that the nature of the Games fits a normal distribution and is unlikely to change the 'order generating rules' of society, making emergent effects unlikely).

Theory of change

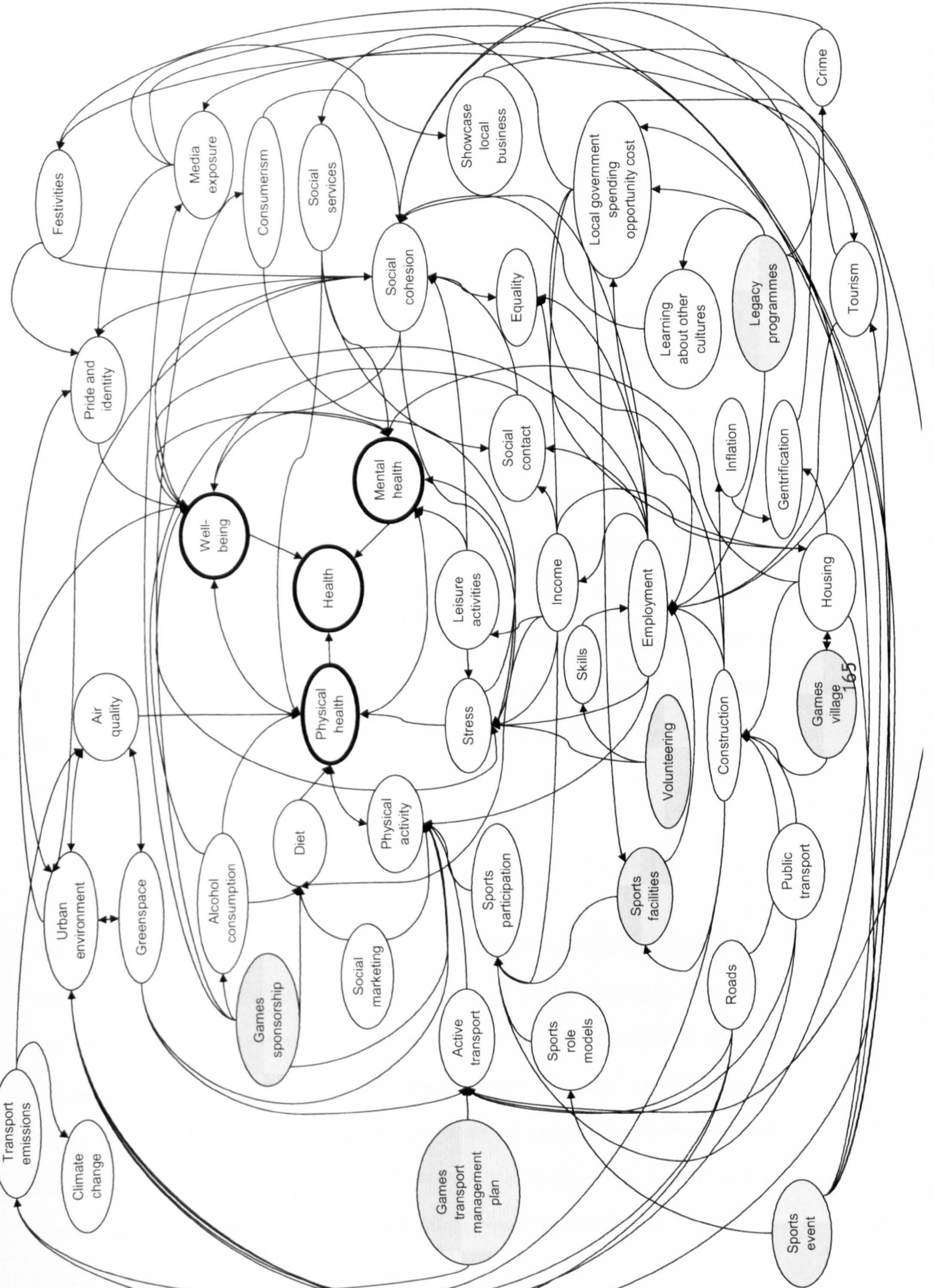
The first step in planning a comprehensive evaluation of the 2014 Commonwealth Games is to generate a 'theory of change'. This is an explicit description of the theoretical mechanisms through which the event might generate outcomes (including health, economic and social outcomes). The best way to do this is to combine the theories of policymakers; academic experts and public perception. The health impact assessment (HIA) sought to use this methodology to identify the potential impacts of the Games by bringing together the Scottish Government's theory of change (Chapter 6), a systematic review of the literature from previous

similar events (Chapter 5) and a comprehensive public engagement exercise (a key element of the HIA).

Any theory of change is only a theory. As the effects of the Games begin to occur new theories could emerge and old theories could be discarded. It is only in retrospect, and with meticulous process evaluation and qualitative work, that the actual mechanisms through which the Games impact on the host population could be known. However, the purpose of a theory of change at this stage is to plan the evaluation, not set in stone the definitive mechanism through which impacts are generated. It therefore details the likely and potential mechanisms through which the event might effect the host population. This theory has health outcomes at the centre. It is of necessity summarised, even where an attempt is made to represent the range and complexity of the mechanisms of impact (Figure 30). For example, a contribution to climate change is detailed as a potential impact without fully detailing the mechanisms through which this might generate health impacts.²⁰⁹ Similarly, housing improvements have a complicated influence on health which is not fully exposed in the theory.²¹⁰

This theory of change also allows the 'key ingredients' or 'critical pathways' in generating the direct impacts on health to be identified. These are detailed below in the next section.

Figure 30 - How the Games might influence health - a theory of change with health at the centre



Project effects

The aspects of the Games that can be best understood as independent projects or interventions (such as sports participation interventions) are the simplest of the Games impacts to evaluate. Despite this, the quantitative evidence from such interventions associated with previous events has generally been of poor quality. The project effects of the 2014 Games can be evaluated to a higher quality if a theory of change for each project is detailed (using inputs from academia and the evidence base, those implementing the intervention, decision-makers and the public). If the group of individuals who are likely to be exposed to the intervention can be identified in advance a prospective cohort study is the most appropriate method. This is unlikely to be the case, and so a retrospective cohort study should be considered for each 'project'. In order to understand why the impacts are seen a simple quantitative and qualitative process evaluation will be required (consisting of measurement of the reach of the project, its conduct, and proximal outcomes along with semi-structured interviews of those implementing the project and service users).

Direct impacts

The first step in evaluating the direct impacts of the Games is again to detail the theory of change. A cohort study involving a group of individuals exposed to the direct effects of the Games provides the opportunity for high quality evidence on the overall impact on individuals to be assessed. This evidence is dependent on the ability to recruit a comparison group of individuals not exposed to the intervention but comparable in other ways (e.g. educational status, socio-economic status and employment status), and on the ability to define who is exposed to the direct effects and who is not.

Some of the direct impacts are closely related to the area of residence. For example, change in access to leisure facilities, changes in housing quality and urban regeneration all have a geographically-based exposure pattern. For these impacts, a cohort of individuals from the affected communities in Glasgow could be reasonably compared to a cohort of individuals for non-affected communities elsewhere in the West of Scotland or in Manchester or Liverpool as discussed previously. For some of the other impacts, such as employment, economic growth and pride, the exposure is not as tightly based on the geographical area of residence. For some of these the exposure is likely to decrease with increasing distance from the host city (e.g. employment effects are more likely to be felt where individuals are able to commute to work in the host city), whilst others might reasonably expect to have a more universal effect across Scotland (e.g. the inspiration effect felt if Scottish athletes perform well during the event). A cohort with geographical spread throughout Scotland (e.g. communities matched for deprivation in Paisley, Edinburgh and Dundee), and in other nations (such as England, Wales or Northern Ireland) would be required. This is an expensive proposition but would generate the best quality evidence. Data collection on the cohort would have to include as many markers of exposure to the direct effects of the Games as possible (e.g. area of residence, employment type, use of leisure facilities) as well as all the outcomes of interest as detailed in the theory of change. If there is a suggestion of unpredicted consequences of the Games, or emergent impacts (either through qualitative work, media or public discourse), then studies to evaluate this could be nested within the cohort (e.g. case-control studies).

This cohort study could only draw conclusions around the impact of the Games on individuals because of the atomistic fallacy. To evaluate the direct impacts on the population and the economy, ecological data analysis will be required. This is a cheaper alternative and would provide an important adjuvant to the evaluation of the direct impacts using cohort study data.

For the economic impact specifically, a retrospective analysis of the routine data comparing the economic performance of various cities would be appropriate. If decision-makers desire an economic model to evaluate the discrete economic impact this should use actual (and not estimated) data and take account of the opportunity costs.

Process evaluation for direct impacts

If significant direct impacts are not seen as a result of the Games using the methods described above, there will be a desire to learn why. This is normally the domain of a process evaluation, but the method for this for the direct impacts is not obvious. It has been suggested above that a 'critical pathways' approach which identifies the 'key ingredients' of the intervention is one such method that could be adopted.

Figure 30 illustrates the theory of change for the Games and the key ingredients expected to generate impacts.

Table 5 below isolates the most important critical pathways (or key ingredients) for the direct impacts. These were selected because of the large number of effects they are proposed to generate within the complex theory of change, and because they are invested with the greatest degree of hope in the Government and City Council plans.^{148, 155} They are *critical* pathways because without each of the links across the rows in the table, the outcomes on the right cannot be expected to arise from the Games. For example, if the combined impact of increased tourism, investment in Games-related infrastructure and increased trade are not greater than the economic opportunity cost, then economic growth as a result of the Games cannot occur (unless there are mechanisms not identified in the theory of change). Furthermore, if economic growth does not then generate increased employment, income and service provision, then the expected health and social impacts expected from this mechanism will not occur. Therefore, a process evaluation of each of these critical pathways can elucidate why certain impacts have occurred (or not occurred). For some of these critical pathways there is uncertainty about one of the columns more than the others. For example, in terms of physical activity, there is little uncertainty that increased sports participation (unless it is compensated for by decreased physical activity elsewhere in an individual's life) is likely to lead to increased physical activity and that this is associated with increased health.²¹¹ In contrast, there is much greater uncertainty about whether or not a major sports event can increase sports participation.⁵⁶ Focussed evaluation of these pathways (perhaps utilising the cohort or ecological studies described above in combination with routine service data such as spending on infrastructure projects) will therefore provide a process evaluation for the direct impacts.

Table 5 - The critical pathways for the direct impacts of the Games

Key ingredients	Critical pathway	Direct impact
<ul style="list-style-type: none"> • Increased tourism • Increased exporting of goods and services (trade) • Investment in Games-related infrastructure • The opportunity cost of investment in Games-related infrastructure 	Economic growth	<ul style="list-style-type: none"> • Employment • Income • Equality • Service provision
<ul style="list-style-type: none"> • Provision of new sports facilities • Inspiration (festival and demonstration effects) 	Increased sports participation	<ul style="list-style-type: none"> • Increased physical activity and health
<ul style="list-style-type: none"> • Part of host city or nation 	Increased pride and sense of identity	<ul style="list-style-type: none"> • Health, wellbeing and social impacts
<ul style="list-style-type: none"> • Opportunity for volunteering at Games 	Volunteering	<ul style="list-style-type: none"> • Increased skills • Increased future volunteering • Health, wellbeing and social impacts
<ul style="list-style-type: none"> • New housing • Improved urban design • Regeneration • Transport improvements 	Improved environment	<ul style="list-style-type: none"> • Health, wellbeing and social impacts

Catalytic impacts

To know whether or not a greater effect is seen from existing policies and interventions as a result of the Games will be difficult to quantify. Qualitative analysis, particularly interviews with key informants in the relevant sectors, might provide scope for the design of an appropriate quantitative study targeted to capture such outcomes. In the absence of any specific detail of the expected catalytic impacts however, it is difficult to know where to start with a quantitative study. This is the approach that is recommended by Pawson and Tilley in the realistic evaluation method, where the appropriate methodology to capture impacts will often not be apparent at the beginning, but actively seeking unexpected impacts and processes during the intervention facilitates nested studies.⁷⁶

Why might we wish to collect evidence from the 2014 Games?

Public health academics have, for many years, argued for the application of research evidence to the development of public policy.^{68, 73, 212} This is based on the logic that it is possible to learn from variations and differences in policies such that knowledge of what works, for whom, and in what contexts, can then be used to develop policy in the future that maximises health, minimises inequalities and has positive social impacts.⁷⁶ Its proponents argue that learning from such experimentation and evaluation across different contexts can then be synthesised to generate knowledge on the key components that generate impacts, what degree of certainty there is about the direction and magnitude of the impacts, and the degree of generaliseability to different contexts for this learning.^{82, 213}

Glasgow is very different to other cities in the UK, despite its similar social and industrial history to Manchester and Liverpool.^{16, 24, 214} This raises the question of how useful evidence gathered in Glasgow regarding the impact of the 2014 Games is for future host cities or for other interventions in Glasgow. Is Glasgow's unique context an insurmountable barrier to the generaliseability of evidence gathered here? Furthermore, what is the merit of an extensive research programme on the impacts of the 2014 Games if it is unlikely that a major multi-sports event will return to the city in the next 50 years? In short, is the unique nature of the city, and of the intervention itself, so peculiar that in fact any evidence gathered relating to it be only of historical interest rather than of practical use to policymakers for the next 50 years?

This might be true if all aspects of the intervention are unique to a major sports event. However, the theories of change illustrated earlier suggest that impacts are

likely to arise from project effects (which are largely independent of playing host), direct effects (arising from activities required for the event to take place, but from activities that could be implemented outwith the context of an event) and catalytic effects. Therefore, if this classification and the assumptions upon which it depends hold, then there is learning to be gained for Glasgow from the Games that may be applicable to other similar interventions in the future (e.g. the construction of housing or the introduction of a sports participation project). The generaliseability of this learning beyond the context of Glasgow may require a greater number of caveats.

One method of influencing public policy in the interests of population health is the use of health impact assessments (HIAs).^{88, 215} The HIA discussed earlier in the thesis of the plans for the 2014 Games sought to influence the amenable decision-making around the event. That is to say that there were bounds to what the HIA group could recommend since the decision to play host to the event was irreversible, and there were a number of other non-negotiable components of the Games such as the construction of the M74 motorway extension (which could be argued to be unrelated to the hosting of the Games). Despite these limitations to the scope of the HIA, the process allowed public health professionals to draw upon the evidence from previous events to make recommendations that had the potential to positively influence health and the determinants of health (see Chapter 4). The HIA made a large number of recommendations aimed at maximising the benefits and mitigating any negative impacts. The recommendations were informed by the extensive public consultation process,²¹⁶ the systematic review, previous systematic reviews and syntheses,^{210, 217, 218} a range of primary studies (identified as part of the systematic review) and the expert opinion of the HIA group.

In the past, the HIA process has been criticised as lacking an ability to accurately predict outcomes (and therefore justify its recommendations).⁷⁷ However, HIAs rely on the availability of evidence to make recommendations (in combination with expert opinion and the results of public engagement exercises). Is it a lack of empirical evidence that is the problem, the views of the public, or the influence of the experts in drafting the recommendations? Or is it an inability to generalise the findings of studies in one context, often where the complexity of the intervention in relation to the surrounding social situation has been reduced in the analysis, to another context actually the limiting factor? Is it possible, or desirable, for an HIA to make a series of recommendations without estimating the net health (or social) impact?

One group of HIA practitioners has commented that:

*“First, not everything that can be quantified is important. Second, not everything that is being quantified at present should be, if this cannot be done robustly. Finally, not everything that is important can be quantified: rigorous qualitative HIA will still be needed for a thorough assessment”.*²¹⁹

This illustrates the difficulties faced by academics and practitioners who seek to influence policy decisions with evidence, but are limited by the scope, quality and generaliseability of the evidence base. The authors above argued that where there are gaps in evidence, the assumptions and estimates which fill this evidence gap must be explicit.²¹⁹

It is clear from the experiences of others that attempts to influence policymaking using evidence is fraught with difficulties, both relating to the quality and scope of the underlying evidence base,²²⁰ but also to the means of engagement with

policymakers and the other important influences on policy.^{87, 221, 222} This section has highlighted the additional problem of generalising the evidence from one context to others. But what is the alternative?

This chapter has argued that the key ingredients of the 2014 Games can be identified and their proposed mechanisms of action can be exposed. In doing so, the impact of the Games can be evaluated. The concerns raised about the use of evidence to influence policymaking have been discussed and the difficulties of generalising findings from one context to another, and ultimately predicting the net impact, have been highlighted.

Despite these difficulties, the next chapter will consider the question of the likely impact of the Games on the health of the host population, and how academics can best use evidence to inform the policy process.

8. Synthesis: do the Games constitute a health improvement intervention?

8.1. Overview of chapter

This chapter seeks to answer the central overall research question of the thesis: how will the 2014 Commonwealth Games impact on the health of Glaswegians? It addresses this question by building upon the learning from the previous chapters including: the context of the 2014 Games; the learning from the Government's theory about how changes are expected to happen and the evidence from previous events about what impacts are seen.

The chapter focuses on six critical pathways if impacts are to be generated and considers which of these pathways are likely to see change as a result of the Games. In doing so the chapter draws conclusions on the likely net impacts of the 2014 Games.

8.2. Introduction to the synthesis

The easiest option for academics is to call for more evidence before making a recommendation or prediction. However, in this area of public health it will never be possible to conduct experimental studies, and even if this were possible, there would always be context-specific impacts that would prevent complete generaliseability from one population to another. On this basis, it is appropriate to try to inform policy-making with evidence, and to use the imperfect research that is available, rather than withdraw from engagement with the policy-makers.²²³

This chapter of the thesis will synthesise the learning from the previous sections in order to come to a conclusion on whether the 2014 Games can be considered as a positive public health intervention.

The context of the 2014 Games

In considering what the net impact of the Games will be on health, and the determinants of health, it is key to consider how similar the intervention is to previous events.

There are clear differences with many previous events: the 2014 Games relies on the refurbishment or adaptation of existing facilities for a large proportion of the sports infrastructure for the event, and there is no dependent urban regeneration tied to the event (although there is significant parallel regeneration taking place in Glasgow it pre-exists the winning bid and at most could be considered as subject to a catalytic impact from the event). The preparations for the Glasgow event also take place during the deepest economic recession for approximately 60 years, in contrast to all other comparable events (including all of those included in the

systematic review). Finally, Glasgow is a more unhealthy and deprived city than most, and the generaliseability of studies from other cities and events must be limited by this. However, a pattern is developing where major sports events such as Commonwealth Games and Olympic Games are taken to the most deprived areas of cities, partially in an attempt at regeneration, but also because of the availability of vacant land within the city boundary. This has been the case for the 1992 Olympics in Barcelona, the 2000 Olympics in Sydney, the 2002 Commonwealth Games in Manchester and will be the case for the 2012 Olympics in the East End of London. Therefore, despite Glasgow being more deprived than most cities, the location of the village and major arenas within the poorest area of the city is a common feature.

Synthesis method

The method adopted for the synthesis built upon the theory of change developed for the evaluation of the Games and applied a 'critical pathways' approach adapting the work of Penny Hawe and colleagues.⁸³ It sought to identify the 'key ingredients' in the intervention which are necessary if change is to be realised along the theory of change pathway.

Having identified the critical pathways for the Games intervention, the available evidence was then applied to each of these pathways and conclusions drawn on the likelihood of change occurring. The overall pattern of the intervention was then considered and a critical analysis of the nature of the Games performed.

8.3. Synthesis results

The critical pathways to generate a positive legacy

Despite the potential differences between the 2014 Games and other events outlined in section 9.1 above, there are a range of common features which might be considered the 'key ingredients' in generating impacts from the Games. These were elucidated in the chapter 8 for the direct effects. Table 6 reiterates the 'critical pathways' described earlier.

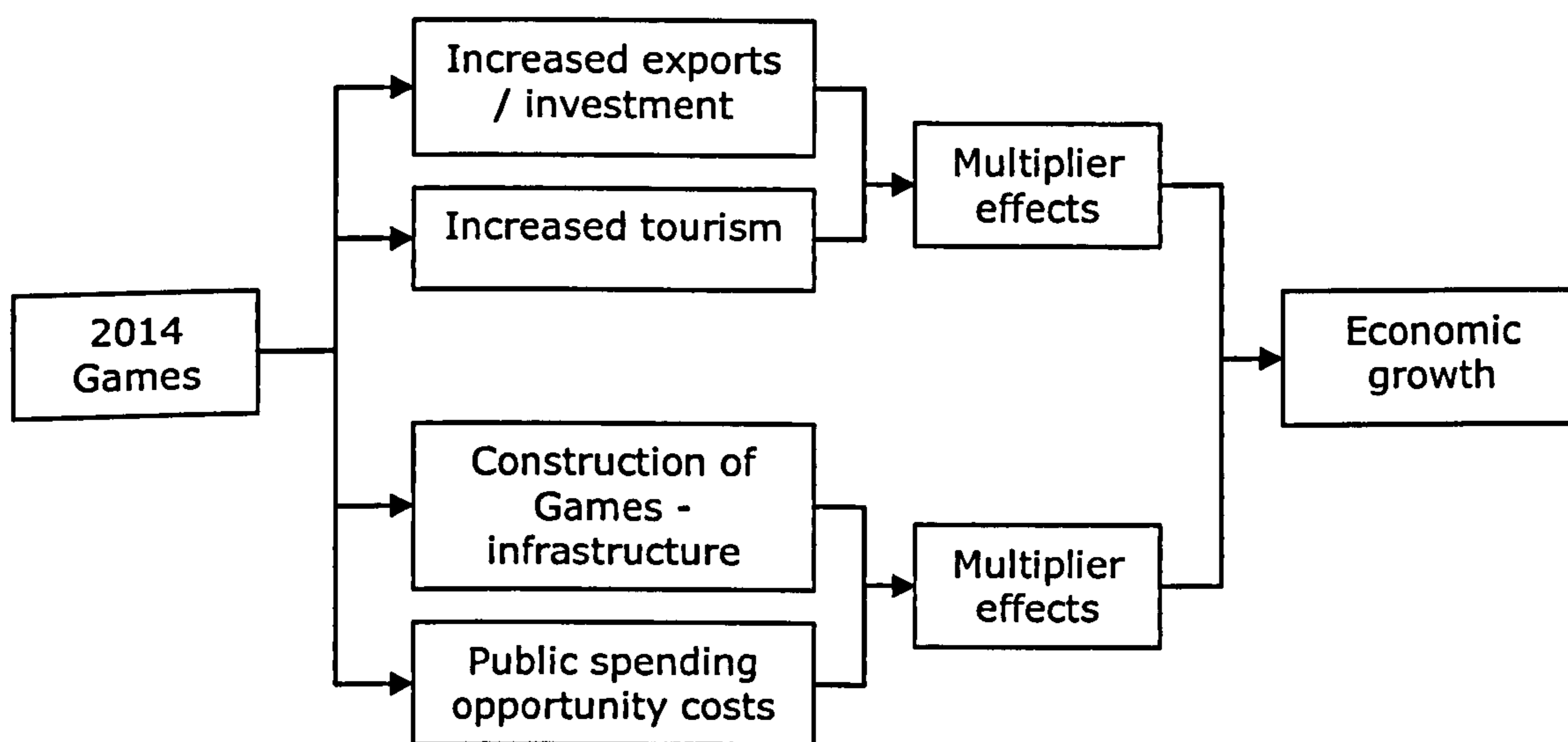
Table 6 - The critical pathways for generating a positive Games legacy

Key ingredients	Critical pathway	Direct impact
<ul style="list-style-type: none"> • Increased tourism • Increased exporting of goods and services (trade) • Investment in Games-related infrastructure • The opportunity cost of investment in Games-related infrastructure 	Economic growth	<ul style="list-style-type: none"> • Employment • Income • Equality • Service provision
<ul style="list-style-type: none"> • Provision of new sports facilities • Inspiration (festival and demonstration effects) 	Increased sports participation	<ul style="list-style-type: none"> • Increased physical activity and health
<ul style="list-style-type: none"> • Part of host city or nation 	Increased pride and sense of identity	<ul style="list-style-type: none"> • Health, wellbeing and social impacts
<ul style="list-style-type: none"> • Opportunity for volunteering at Games 	Volunteering	<ul style="list-style-type: none"> • Increased skills • Increased future volunteering • Health, wellbeing and social impacts
<ul style="list-style-type: none"> • New housing • Improved urban design • Regeneration • Transport improvements 	Improved environment	<ul style="list-style-type: none"> • Health, wellbeing and social impacts

Critical pathway 1: economic growth

For a positive legacy to arise from economic growth, the Games need to generate an increase in tourism, increase inward investment and increase exporting of goods and services (trade) that in combination offset the opportunity costs of investment in Games-related infrastructure and other Games-related spending (such as policing); or the investment in Games-related infrastructure has to have a greater 'multiplier effect' (knock-on impact on the rest of the economy) than investment in other public sector projects and policies (Figure 31).

Figure 31 - The economic growth critical pathway



The systematic review suggests that none of these assumptions are a given. The impacts on tourism and economic growth are at best unclear, and at worst negligible or even negative. The opportunity costs have not been accounted for in the economic evaluations of previous events. Furthermore, the 'dose' of the 2014 Games is less than many of the events included in the systematic review (e.g. Olympic Games attract a much larger number of athletes and tourists).

A wider debate is taking place within public health about whether the benefits of economic growth on health and social circumstances seen in the last 150 years²²⁴,²²⁵ are now unlikely to be associated with future health and social gains because of the dangers of climate change, resource scarcity, obesity, inequalities and consumerist-driven mental health problems.^{78-80, 226-228} Despite this, it is very likely that economic growth, were it to be realised, would increase employment, income (although income inequality may increase)^{67, 229, 230} and service provision. However, economic growth driven largely by public sector investment is likely to have a large opportunity cost elsewhere in the public sector - a phenomenon witnessed in Sydney following the 2000 Olympics.¹¹⁹

In Glasgow's favour, there is less investment in infrastructure required to host the event as many existing venues are being utilised or refurbished in contrast to other events such as the 2012 Olympic Games.

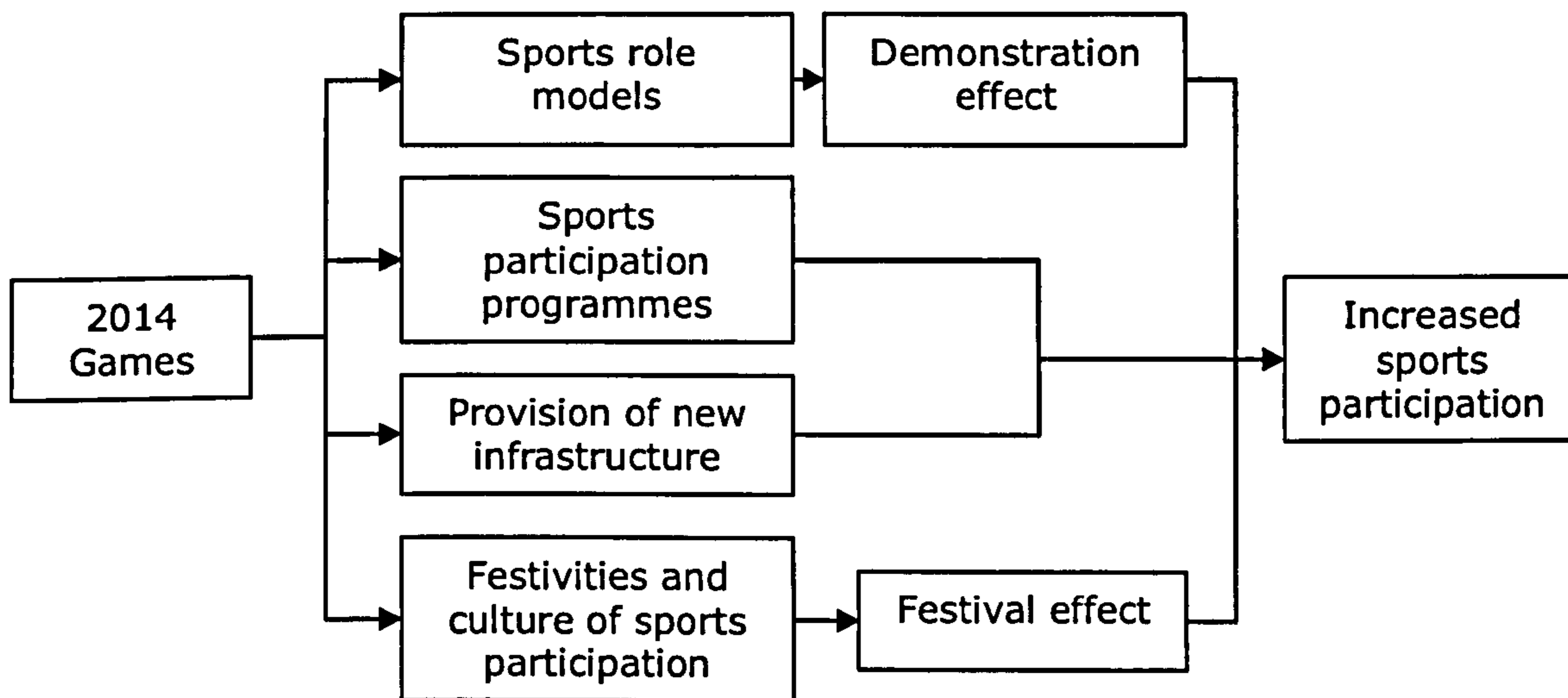
On balance, there is little or no evidence to support the assertion that the Games will generate increased economic growth. For the impacts on employment, income, equality and service provision to be realised (and then by extension, positive health and social benefits to occur), there has to be a link between them and economic growth.

In summary, it is unlikely that the 2014 Games will create economic growth, but there is concern that the Games will increase inequalities or reduce public spending on other policies and programmes.

Critical pathway 2: increased sports participation

Professor Mike Weed led a recent systematic review in preparation for the London 2012 Olympics on the evidence for major sports events generating an increase in sports participation.⁵⁶ The review identified two mechanisms through which such impacts might occur: a festival effect and a demonstration effect. The demonstration effect relates to the ability of events to increase the physical activity of people already participating in sport. The evidence in the review suggests that the impact of this effect is likely to be marginal and tempered by individuals switching between sports rather than increasing their total physical activity. The festival effect relates to the possible increase in sports participation for those not currently doing so. The review suggests that this effect is also likely to be limited (probably confined to an ability to increase the contemplation of physical activity in non-participating individuals) and dependent on support for the event and dependent on any routes into physical activity being avoiding sports and being rooted in the local community. There are two other possible pathways that might lead to increased sports participation: the provision of new infrastructure and the 'project effects' from sports participation legacy programmes (Figure 32).

Figure 32 - The sports participation critical pathway



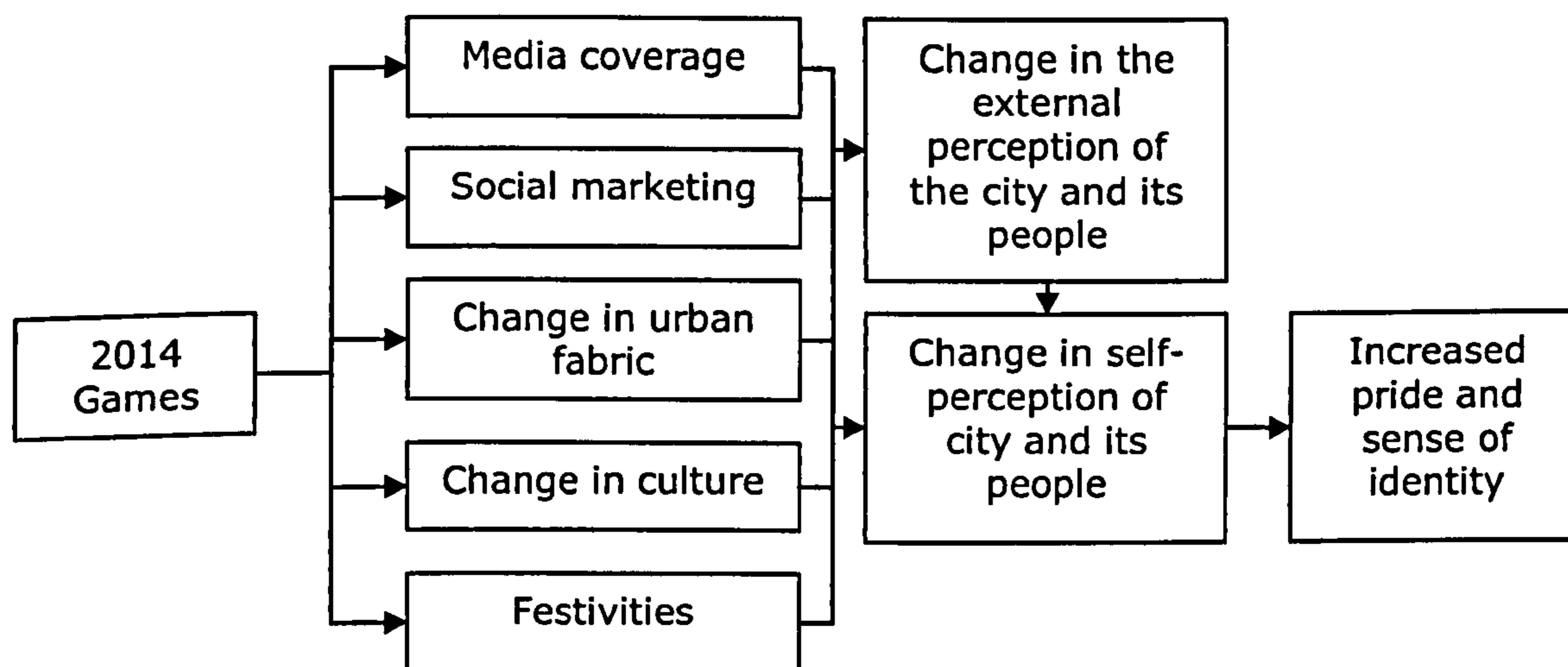
The review in Chapter 5 identified limited evidence of physical activity impacts: there was a steady increase in Barcelona in the decade before and two years following the Olympics there; and there was a mean decrease in physical activity following the Manchester Commonwealth Games in 2002 (a decrease that was also associated with increased inequalities in participation). The quantity of new sports infrastructure being built in Glasgow is relatively modest in comparison to previous events, and some of the infrastructure is designed to maximise sports participation (e.g. the cycling velodrome is a facility most likely to suit existing sports participants and elite cyclists, and the new 50m pool at Tollcross will be adjacent to the existing pool and will therefore not provide much additional access).

At best, this critical pathway is likely to have a very modest positive impact and probably only on individuals who already participate in sport. There is also concern that inequalities in physical activity may increase.

Critical pathway 3: increased pride and sense of identity

There is somewhat of an evidence gap for this critical pathway, although less is expected of it in terms of direct impacts described by decision-makers. It was identified in the community engagement of the HIA as a likely result of playing host (i.e. this was perceived by the public to be a likely outcome of the Games). This could reflect the self-perception of Glaswegians of a city in need of a boost; a city lacking identity following the loss of its industrial history; or instead a confidence that the Games were likely to generate a plethora of benefits that would see the city and its people go from strength to strength. All of this is conjecture, as are the links between such increases in pride and identity and health and social benefits (Figure 33).

Figure 33 - The increased pride and sense of identity critical pathway



It is therefore the case that the likely effect of this critical pathway is largely unknown and in need of thorough evaluation. However, there is certainly an opportunity for the event to recast and rebrand the City.²³¹ During the 1980s Glasgow was marketed, both to its people and to the rest of the world as

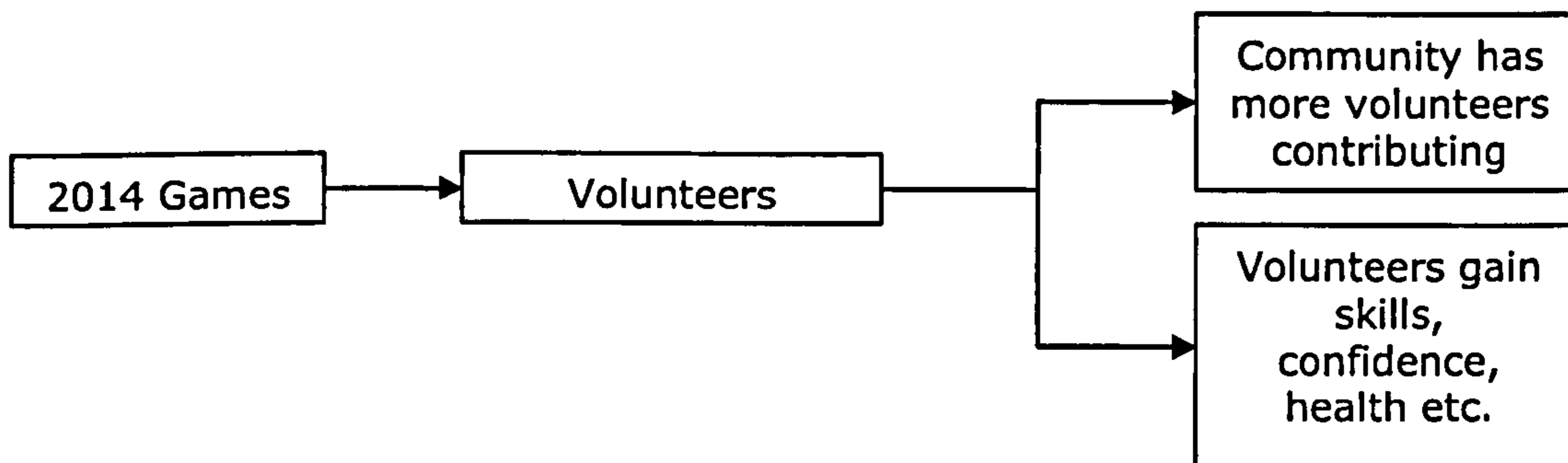
“Glasgow’s Miles Better” - branded on a Mr Happy as a kind of friendly face with a confidence beyond the reality in the city during this decade.²³² This evolved into the era of the Glasgow Garden Festival, the City of Culture, the City of Architecture and, eventually by the late noughties, to, “Glasgow: city with style”. This was an attempt to market Glasgow as a consumer paradise, criss-crossed with the biggest and best shopping arcades and all the services that accompany them.²³³ In common with the growing public health analysis of economic growth, an overwhelming concern and identity with consumerism is unlikely to be helpful for public health.^{234, 235} If Glasgow was to use this opportunity to reframe its identity then a net positive impact could be expected. This agenda does not look likely at this time to be pursued by decision-makers, and the potential for the critical pathway to generate positive impacts is therefore likely to be muted.

Critical pathway 4: volunteering experience

It is estimated that 15,000 volunteers will be required during the 11 days of the Games.⁴⁷ Volunteering is said to bring a variety of benefits both to the community at large and to the individual volunteers. In the context of major sports events, the best researched event was the 2002 Commonwealth Games in Manchester where a series of qualitative studies suggested that some volunteers perceived that they had enhanced their skills as a result of the event.^{150, 151} The experience was varied amongst the volunteers with some enjoying the experience and gaining skills and new social networks; with others not enjoying the experience at all, feeling ‘used’ by the event, being underutilised or badly treated. The evidence for longer-lasting impacts either on the volunteers or the community which might benefit is missing (although much discussed).^{152, 236-241} There is no evidence that the Manchester volunteers were more likely to volunteer after the event, even amongst the select group of study participants that were followed after the Games.¹⁵¹ If a similar

pattern is observed in Glasgow, a large or widespread positive impact arising from this critical pathway could not be expected (Figure 34).

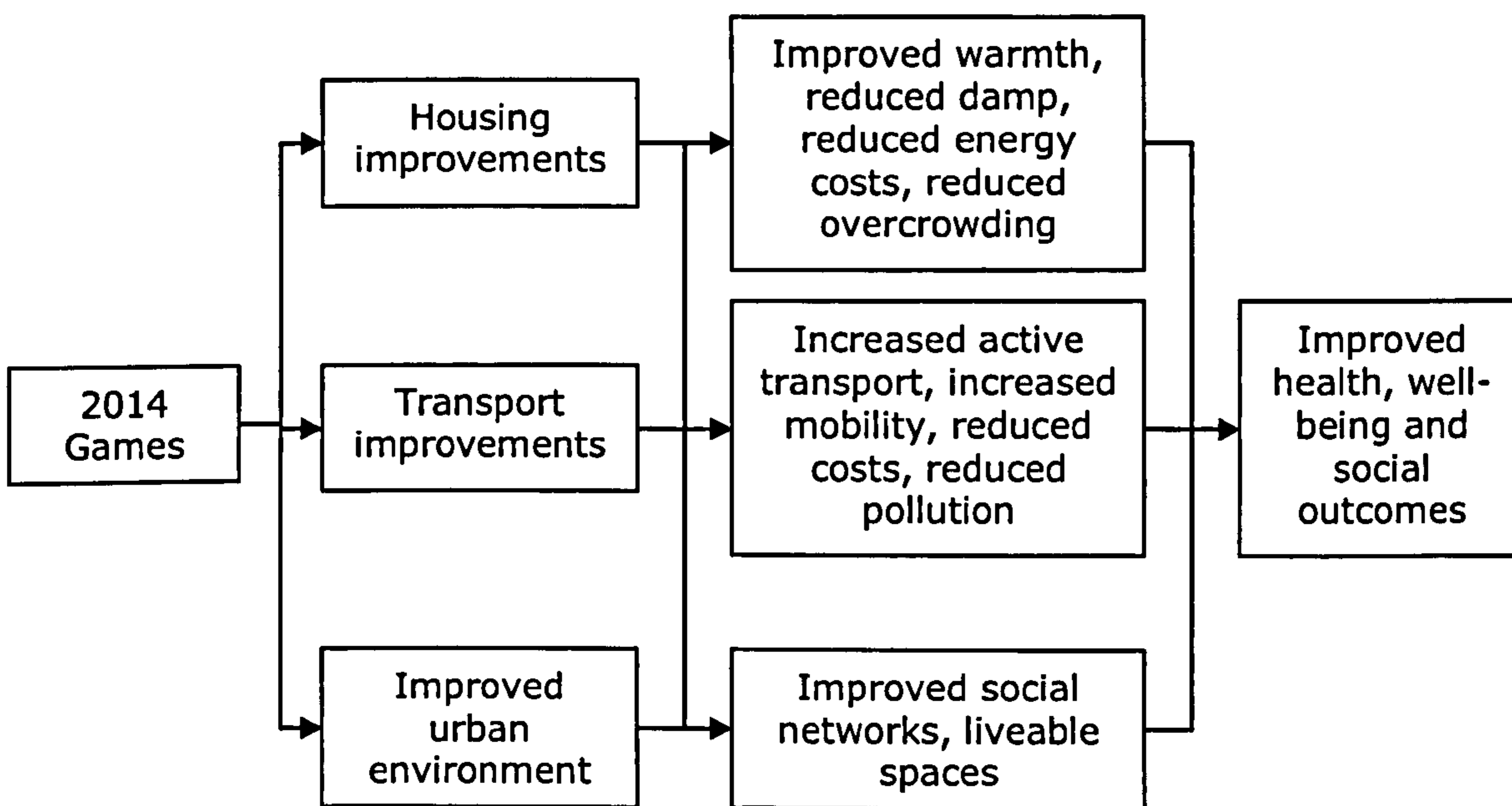
Figure 34 - The volunteering critical pathway



Critical pathway 5: improved environment

There is a much more robust evidence base for the impacts of improved housing,²¹⁰ regeneration,²¹⁸ transport²¹⁷ and urban planning²⁴² on health and well-being. This evidence isn't unequivocal and contains many nuances, but it suggests that improvements in each of these domains may well have important health impacts. What is much less clear is that major sports events are likely to create the kinds of improvements in housing, transport and urban environment that might benefit health and social outcomes (Figure 35).^{44, 243-245}

Figure 35 - The improved environment critical pathway



Transport and the Games

In Glasgow, the event has been associated with the introduction of transport changes such as the construction of the M74 motorway and the East End Regeneration Route (a dual carriageway road linking the M74 and M8 motorways). The net health effects of this are unclear, as accidents are lower on such roads and this is easier to measure than the effects of increased traffic, air pollution, community severance and other potential negative impacts. In truth, these transport interventions were planned long before Glasgow won the right to host the Games and would have occurred in their absence. However, it is difficult to be persuaded that these road-based transport initiatives might leave a positive legacy for health. In contrast, there is a small-scale planning legacy of the new Games village which is likely to be beneficial. This area is planned on the basis of being car-free during the Games. This potential positive legacy requires to be embedded

into the future plans for this urban village if host population impacts are to be realised.

Housing and the Games

The Games village being built to house the athletes during the event is planned to be converted into a mix of social and private housing at the conclusion of the event. It is currently proposed that 20% of this housing will be social housing, but the design is not yet clear. The bid document and the Government plans suggest that the new housing will be of a high environmental standard and will incorporate many of the 'healthy urban design' principles. The plans do not suggest that gentrification will be a feature of regeneration of the immediate area, although concerns have already been raised in Dalmarnock (adjacent to the village site) that a housing demolition programme is directly associated with the Games and the fact that some 80% of the new housing will be privately owned suggests that this is for an incoming, rather than local, population.^{197, 246, 247}

Urban regeneration and the Games

Other than the Games village, there is little or no regeneration planned as part of the 2014 Games that was not already planned before Glasgow won the right to play host. Glasgow, and the East End of Glasgow in particular, have had numerous attempts at regeneration in recent decades.²⁴⁸ The impact of urban regeneration programmes per se is not clear,²¹⁸ although the need for material improvements in many of the neighbourhoods in Glasgow's East End is not in doubt.⁵ What is more clear is the plans for the new Games village and sports infrastructure in the adjoining area. This has more permanence in design than the previous event-based site associated with the Glasgow Garden Festival (1988) which left a large

brownfield site undeveloped for some 15 years after that event.²⁴⁹ Urban regeneration related to the Games therefore has much more potential to generate positive benefits. That said, the people who will benefit from this urban regeneration will not be, for the most part, the current residents of the area nor the poorest citizens of the city. The Games village will have a small proportion of social housing contained within it and is likely to lead to gentrification of the existing area. This is not a bad thing for the incoming residents who will have access to quality housing, but will displace existing residents who will not be in a position to purchase such housing or access the new facilities being planned.

Critical pathway 6: legacy programmes

For legacy programmes to be an important mechanism for generating positive benefits either the programmes or policies need to be effective in their own right, or they must be effective in the context of a Games host city. The Weed review⁵⁶ suggests that there is a small possibility of generating an improvement in physical activity through legacy programmes, with several important caveats. The evidence for cultural or arts programmes is suggestive of some net positive impacts, but is largely limited to qualitative analysis.²⁵⁰⁻²⁵² Critically, the reach of most legacy programmes is limited to those who actively engage with them. This means that the prospect of generating a whole population impact is likely to be limited. Quantitative evaluation of the impacts of these legacy programmes should be a priority for the 2014 Games (Figure 36).

Figure 36 - The legacy programme critical pathway



9. Discussion

9.1. Overview of chapter

This chapter discusses the main findings of the thesis by chapter, the strengths and weaknesses of the methods, the validity of the results and the implications of the thesis for policy.

9.2. Main findings of the thesis

Context of Glasgow and the 2014 Games

The population of Glasgow has the worst health record in the UK and suffers from large inequalities in health between its citizens. Numerous attempts have been made in previous decades to design programmes and initiatives to improve this record, with limited success. The Scottish Government and Glasgow City Council believe that the Games is an intervention that can deliver health and social benefits and catalyse existing health and social improvement programmes in the City, and as such there are very high expectations for the ability of the event to create positive impacts. This thesis has examined what evidence there might be for such impacts and considered how an evaluation would require to be structured to measure these impacts.

Systematic review

The review found little or no evidence that previous events had generated such benefits, and that those studies which did suggest benefits (particularly economic benefits) used large amounts of estimated data and failed to take account of opportunity costs. The evidence base is dominated by poor quality studies and there are large gaps in the range of outcomes evaluated, particularly with respect to health. However, commissioning and publication biases towards positive results should be expected for this research question (particularly because a large proportion of the studies identified were funded by the organising committees of events). Given the review's extensive coverage of published and unpublished literature, it is unlikely that there has been a large positive effect on health or on socio-economic determinants of health that has been overlooked. This includes

impacts on health, the economy, transport (although there is evidence of short-term benefits of reduced congestion and air pollution during events), housing or culture. There is therefore an ‘absence of evidence’ of positive impacts on health and the socio-economic determinants of health, but also a missing quota of evidence showing positive impacts that might be expected for such a research question even if the net impact was equivocal. This suggests that large positive impacts are unlikely to have occurred from previous events.

Analysis of the Government’s theory

The Scottish Government’s legacy documentation suggests that the 2014 Commonwealth Games will generate a wealth of positive impacts for the population including health, environmental, economic and social benefits. Some of the outcomes and mechanisms described by the Government are relatively simple and uncontroversial (e.g. training Games volunteers in first aid), whilst many of the others are challenged by the evidence from previous events (e.g. that the Games will inspire the population to increase their physical activity rates).

The mechanisms through which the event is described as being able to achieve these outcomes can be divided into three types:

- **Direct impacts -** These are impacts that occur as a direct result of an activity intrinsically associated with hosting the event (e.g. the construction of new sports infrastructure specifically for the event)
- **Catalytic impacts -** These are the impacts on existing policies and initiatives that are thought to arise from changes in the underlying context that can be attributed to the

event (e.g. an existing social marketing campaign aimed at increasing physical activity might have a different impact in the context of a sports event)

- **Project effects -** These are the impacts of activities not essential to the hosting of the Games, but that are created or branded as related to the Games in an attempt to leverage maximum benefit from them

These mechanisms, with the possible exception of the catalytic impacts, are not dissimilar to the mechanisms of the previous health and social initiatives and programmes that have been tried over the last two decades.

Health impact assessment

A conclusion on the net impact of hosting the 2014 Commonwealth Games on the health of Glaswegians, and the determinants of their health, was not within the remit of the health impact assessment. This was because of the collaborative nature of the HIA which involved employees and corporate procedures of Glasgow City Council. This meant that the purpose of the HIA was limited to making recommendations to maximise the positive impacts of the event, and minimise the negative impacts of the event, rather than make any predictions of the net overall impact.

There are high public and governmental expectations of playing host and the Games have generated a great deal of interest and debate about the possible impacts. The HIA concluded that it is likely that the Games will influence health most through impacts on the economy, civic pride, engagement in decision-making, the provision of new infrastructure and participation in cultural events. A range of

recommendations were made reflecting the available evidence and the collective wisdom of the public and participants in the HIA process. These included: a recommendation that a higher proportion of the new housing built to accommodate athletes during the event should subsequently be made available as social housing; transport policies before, during and after the event should promote active transport and make public transport more affordable and accessible; and public involvement in the decision-making processes about the use of the new sports infrastructure after the event should be increased. Further evaluation is required to assess how successful the HIA process was in terms of community participation and validity, on the question of how effective the HIA was at influencing policy-makers, and on whether the impacts discussed in the HIA were realised.

Evaluating the 2014 Games

The Games is a complex intervention which is particularly challenging to evaluate. There are three types of mechanisms of impact described in this thesis: project effects, direct effects and catalytic effects.

The project effects arise from specific projects or programmes that are undertaken in the context of the Games, but which could be implemented in the absence of such an event. It is proposed here that a higher quality of evidence could be gathered from the 2014 Games on the project effects if either a prospective cohort study (where the participants in the projects can be predicted in advance) or a retrospective cohort study (where the participants will only be known after they have taken part) is arranged. This will require to be undertaken in combination with qualitative studies and the creation of a theory of change to understand why such project effects are seen.

The direct impacts of the Games, that is the impacts that occur as a direct result of playing host (such as the impact on tourism), require a different approach to achieve a quality evaluation. First, a theory of change to identify the critical pathways in generating impacts (as has been done in this thesis), should be elucidated. Next, a combination of a cohort study and an ecological study (using routine data and a series of comparison areas identified in advance), should be used to identify the attributable impacts of the Games. Qualitative work alongside these studies will be required to understand why the impacts occur (or not). For the economic impacts specifically, an ecological design or economic modelling (using IO or CGE methods) should be performed using actual data and taking account of the opportunity costs.

The catalytic impacts are particularly difficult to evaluate as it is not yet clear what these impacts might be. These potential impacts will require to be identified using regular qualitative work with key individuals within the public and private sector in Glasgow, and this information used to design quantitative studies to test these hypotheses.

The Games as a health improvement intervention

It is recognised that contextual differences between events may be important in discerning whether particular impacts can be expected from the 2014 Games that have not been seen previously, and so the 'critical steps' for each of the mechanisms were sought to allow analysis of the potential impacts within the Glasgow context. It was identified that some of these critical steps were very similar to the tried and tested mechanisms used over many decades in the West of Scotland in attempt to improve the health and social conditions (economic growth and improved environment). The ability of the Games to impact on the other

critical steps (sports participation, increased volunteering and increased pride) is not supported by the evidence from previous events, and it is difficult to see what is different about the plans for the 2014 Games that might generate a different result.

Therefore, the 2014 Games are unlikely to be an effective health improvement intervention and are unlikely to generate the plethora of social and economic benefits that pepper the bid document and legacy plans.

There is a legitimate concern that the marketing of the Games as an intervention for health and social improvement might deflect attention from more important determinants of health in the city: the critique made by the 'bread not circuses' writers. In that vein, it may be more reasonable to make few other claims for the Games than that it will provide public entertainment and a festival for the population.

9.3. Strengths and weaknesses of the thesis

This thesis used a number of different methods to consider the evidence of effects of the Games. It has used rigorous systematic review methods to evaluate the evidence from previous events, provided an in-depth analysis of the Scottish Government's theory, developed a critical pathways analysis of how impacts might be generated and critically appraised various methods of evaluating the event.

Systematic review

Of the 256 references identified as being potentially relevant for the review, 34 could not be obtained for screening and appraisal (these are detailed in Appendix 6). For these 34 studies, an institution holding the research could not be identified or the institution (or author) was unable to provide remote access. Most of them were not peer-reviewed studies and the quality was therefore likely to have been low. However, it is possible that these studies could have provided a different picture of the impacts of previous events had they been available for inclusion.

As with all systematic reviews, the answer provided to the review question is only as good as the evidence available. This can be affected by publication bias, where studies (usually negative) are not published, and by commissioning bias (where studies are more likely to be funded where positive effects are more likely to be found). Publication bias towards positive impacts from sports events is likely. For example, the MORI study on physical activity around the 2002 Commonwealth Games in Manchester is not available on the internet or in the published literature, and the results were not publicised, but I identified its existence through word of mouth from one of the participants at the HIA scoping event. Although this study

was identified, requested, received, and subsequently included in the review, it is possible that there are other studies that were not identified. In contrast, no studies were included from campaign groups seeking to suggest that events had deleterious effects because none provided an evaluation (only theoretical and commentary pieces were identified).

The quantity of evidence available for the review varied between events with the more recent North American and Australian events researched most extensively. There was also a change in the emphasis of event organisers from 1978 through to 2008, with later events focused more on regeneration and the creation of a positive legacy in contrast to the earlier events' focus on showcasing the city and entertainment.⁵¹ This limits the ability to generalize the impacts from the earlier events to contemporary ones as the nature of the expected impact appears to have changed.

The overall quality of the studies included in the review was low, but taken together it is telling that there was no overall picture of positive impacts arising in association with major multi-sport events.

Pawson has argued that systematic reviews require consideration of the context in which interventions occur if the data are to be interpreted appropriately.²⁵³ Indeed, it is argued that a systematic approach can inadvertently substitute certainty of effect size for an ability to explain findings.²⁵⁴ The alternative method proposed by Pawson, realist review, seeks to exposing the underlying mechanisms, gather evidence on implementation and evaluate the underlying theory being tested.²⁵⁵ However, a realist approach to this section of the thesis would have been limited by the narrow range of outcome measures available for more than one city

which could have facilitated discussion of the influence of context. That said, further exploration of the data with respect to the other strengths of realist review (identifying and testing underlying theories, clarification of the degree of intervention implementation and exposure of the linking mechanisms between intervention and outcomes) may have yielded deeper insights into the impacts of previous major multi-sport events. This could be a focus for future research efforts.

It would have been possible to include studies relating to events prior to 1978 or to include a broader group of events (e.g. single sport events such as the Football World Cup). This approach may have provided richer data from which to draw learning, but the introduction of greater variability in the types of interventions would have reduced the transferability of learning to the 2014 Commonwealth Games.

The strengths of the review were: its broad scope which included health and the socio-economic determinants of health; the extensive efforts to identify all relevant studies including worldwide grey literature in all languages; its systematic and unbiased nature including the use of recognised conventions such as dual independent screening, critical appraisal and data extraction; the use of recognised critical appraisal and synthesis techniques where these were available (e.g. the ESRC guidelines on narrative synthesis). The review has also been independently peer-reviewed by the *British Medical Journal* and accepted for publication.

Analysis of the Scottish Government's theory

This analysis was based on the published consultation document by the Scottish Government shortly after the announcement that Glasgow had won the right to host the Games ('On Your Marks'). As such, it was an early attempt by Government to discern the main outcomes and mechanisms of action of the event, and could potentially have been something of an unfinished work. However, the subsequent legacy plan did not propose alternative mechanisms that were not present in the initial consultation document.^{47, 148} There is also the potential for the official documentation to be different from the 'working knowledge' or 'unsaid' mechanisms if these are unpopular, unlikely or embarrassing in some way for Government. For example, if the Government wished to use the Games as a policy tool to introduce changes to policing that had the potential to interfere with civil liberties, it may not wish to make this mechanism explicit in the documentation. Therefore, a theoretical analysis based only on official documentation rather than qualitative work with policy-makers has the potential to miss some implicit or hidden mechanisms of action.

The analysis of the Scottish Government's theory of how the 2014 Games might create impacts is based on a published consultation document and can therefore be considered an official version of the views of policy-makers. The consultation document it is based upon is explicit about each of the potential outcomes of the Games and the mechanisms that will generate these impacts. This makes it easy to generate a linear theory of change for the intervention. Since it is a consultation document, it is also less bound by the conventional caution that marks Government policy documents, and is therefore quite ambitious, wide-ranging and explicit.⁴⁷ This makes it less likely that important mechanisms of action were not included in the document. The subsequent plans by the Government and Glasgow City Council

did not suggest any additional mechanisms that were not included in this initial consultation document.^{148, 155}

There are several different approaches that could have been adopted in this section, and which might have assisted in generating a deeper understanding of the underlying *theories* adopted by Government. For example, discourse analysis could have used a wider range of communication outputs and linguistic pointers to unpick the implicit and explicit mechanisms adopted by Government (e.g. the links between wealth and health).²⁵⁶ Alternatively, interviews or focus groups could have been conducted with decision-makers in a more focused and formal manner than was conducted as part of the health impact assessment. As it is, this section is mostly descriptive and identifies only the explicit mechanisms in the Government's document.

Health impact assessment

As with all HIAs, the value of this work is limited by the evidence base upon which it draws, the inability to predict impacts accurately and with certainty, and the extent to which its recommendations are acted upon.²¹⁹

The HIA has been the main mechanism adopted by in this thesis to transfer research knowledge to decision-makers. This process has been simultaneously limited and facilitated by the involvement of Glasgow City Council staff in the HIA. They, as City Council employees, are not free to write public documents criticising council policies nor lobby against political policy direction even where the evidence base suggests that this might be the most appropriate course of action. However, this limitation was minimised because of the multi-agency nature of the HIA steering committee which contained health board employees and myself from the MRC. This limited censorship of recommendations generated by the HIA steering

group. The involvement of the City Council employees also enabled us to use the council's own processes to influence the agenda around the Games legacy and ultimately decision-making. Further evaluation of the success of the HIA in doing this is being carried out.

The HIA fell short of predicting what the net impact on health and the determinants of health would be, but did produce over 150 recommendations for City Council policy-makers that were designed to enhance the prospects for a positive legacy. The HIA also managed to engage with the public such that they were made aware of the evidence from previous events and were encouraged to use this in formulating recommendations that could be fed in to the process. The HIA therefore captured the experiential evidence of the people of Glasgow as well as the expert opinion of the HIA group and the evidence from previous events. It is not yet clear how well the HIA managed to influence the decision-making process. The interim Games legacy plan for Glasgow City Council does not contain many of the recommendations contained within the HIA, but this was largely written before its publication.¹⁵⁵ The HIA steering committee have met with the City Council's Games legacy team and have been assured that all of the recommendations, with their supporting evidence, will be used in the planning of the next annual instalment of the Games legacy planning process. A full evaluation of the success of the HIA in influencing policy makers and the learning to be gained for the HIA steering group will be completed in due course, as will the evaluation of the HIA process.

Evaluating the Games

The main weakness of the proposed evaluation framework for the 2014 Games is not its design, but is instead the resource that would be required to implement the

framework. The wide variety of mechanisms through which the Games is envisaged to act require a combination of qualitative studies, longitudinal studies, ecological (repeat cross-sectional) studies and economic modelling. This would require co-ordination, sustained funding for several years after the event, extensive primary data collection and a large team of researchers. However, unless such a research programme is funded, there is a danger that the net impact of the Games will be unclear or worse poor quality (and therefore misleading) analyses will dominate. There is little or no incentive for the Scottish Government or Glasgow City Council to commission such research however, as it is unlikely that the Games will return in the near future and so any learning will be used by other cities and other countries rather than here in Glasgow. In addition to the unlikelihood of the event returning and the consequent limited utility of overall outcome evaluation in the future, Pawson has argued that an overall outcome evaluation has limited merit because of its 'black box' nature.²⁵⁴ In essence, the argument is that whether the overall impact is positive or negative is irrelevant: what is more important is know why some impacts are seen for some groups and in some contexts. Undoubtedly there is a great need to understand this, but it is also important to know the overall impact if population health is the overall goal. For example, if improvements were to be seen in some domains (e.g. physical activity) but were mitigated by a worsening in another domain (e.g. diet) leading to an overall neutral result, this may not necessarily be picked up by the approach advocated by Pawson. Furthermore, although learning from the Games may not inform a future Games event in Glasgow, there are many ideological and mechanistic similarities between this event and other interventions that may be attempted in the future. Thus, learning something about the overall impact is still worthwhile.

This section of the thesis used the existing models for the evaluation of complex social interventions such as the MRC framework,¹⁶⁸ the critique by Hawe,⁸³ theories of change¹⁷² and realistic evaluation,⁷⁶ and applied these to the Commonwealth Games and its plethora of potential causal pathways. In doing so the thesis was able to critically adapt these models such that, if such evaluations were put in place, the quality of evidence available from this event would be significantly better than that available from previous events.

Synthesis

The synthesis section of the thesis relied upon an accurate interpretation of the theories of change for the Games, appropriate identification of the critical steps for the intervention to generate impacts and assumptions regarding the transferability of learning from previous events and the non-complex nature of the *critical steps* of the intervention as part of a much wider complex system. There is also an assumption that the intervention will not be critically different to previous events nor will the unique context of Glasgow generate significantly different impacts from a similar intervention elsewhere. The nature of each of these weaknesses and the potential for them to influence the overall conclusion of the thesis is examined below:

Interpretation of the theories of change

The synthesis is dependent on the validity of each of the components upon which it is built. The first of these is the interpretation of the Scottish Government's documentation to create a theory of change for the Games intervention. The potential for this theory to miss some of the less appealing mechanisms from a Government perspective was discussed above and may mean that a bias towards positive impact mechanisms is introduced into the synthesis. Another potential

danger is that unexpected outcomes can be overlooked because of the a priori focus on “known knowns and known unknowns”.⁵⁵

Identification of the critical steps

The basis of the critical steps analysis is that the components of the mechanisms for the intervention are necessary, but not sufficient, if the outcomes are to be realised. If the critical steps identified in this section are not necessary for the outcome, then this will have focused attention on a section of the logic which could lead to misleading results. However, the likelihood of the wrong critical steps being identified here is low, since it would be illogical if the outcomes were to occur *through this mechanism* without a change in these critical steps. It is of course possible for the outcome to be generated through a different mechanism, but this would be an inaccuracy in determining the theory of change, and not of identification of the critical steps.

Transferability of learning from previous events

If the learning from previous events is to be applied to the 2014 Games with certainty, this requires: a deep understanding of the outcomes and mechanisms of action; minimal influence of context on the way in which the intervention works; and fidelity in the nature of the intervention compared to previous events.

Clearly none of these are entirely true of the 2014 Games. However, the learning sought from previous events is not simply a quantitative estimate of the shift in outcomes associated with events. Instead, an understanding of how Games might generate change and whether there is evidence from previous events that change has been generated along the pathway (or theory of change). For example, if economic growth is said to be an outcome of hosting events, we can learn from

previous events that this depends on future revenues from tourism outweighing the costs of hosting the event, or that the investment in infrastructure creates economic benefits that are greater than the opportunity costs of that investment. Therefore, the learning from previous events is limited if exact quantitative estimates are required, but is not if the direction and mechanisms of impact are of interest.

What is perhaps less certain, is that the 2014 Games will be essentially the same as previous events: that there is intervention fidelity. This thesis argues that even where there are differences between events, they share the same critical steps which allows the transfer of knowledge from one event to another. There is most scope for change where there are project effects (i.e. sub-interventions which could occur independently of the event). However, for there to be a true Games impact, the outcomes from these project effects need to be greater than the opportunity costs and catalysed in some way by the Games. If the nature of the event, its focus on legacy, its use of HIA to optimise the intervention, or if the Games does catalyse the projects associated with the Games, then there is the potential for the event to be different enough to make the learning from other events more limited. However, this is likely to be overwhelmed by the ability or otherwise of the identified mechanisms with the critical steps generating outcomes.

The non-complex nature of the critical steps

The synthesis section of the thesis seeks to minimise the potential for emergent and complex effects to be generated by the intervention that are not predicted. It does this by identifying the critical steps for the intervention to generate outcomes, but this itself depends on the interaction between the event and these

critical steps not being complex phenomena that resist prediction. This section makes the argument for each of these being relatively linear processes which are unlikely to see significant change as a result of the Games, but if any of these were to be realised this may generate complex impacts that might trigger other changes in society which could still be a result of the Games, but through other pathways than those identified here. In short, prediction within a complex system is difficult, but it is a reasonable assumption that there is a low likelihood of change in the absence of one of the critical steps being achieved.

Strengths of the synthesis

The synthesis section of the thesis developed a new method for making an assessment of the likely outcomes of a complex intervention. This method, adapting the ideas of Hawe and using a critical steps approach, focuses attention of the key elements of the intervention and the near term outcome of interest which minimises the effect of context (e.g. one of the most critical steps in generating economic growth from events is that the event increases tourism). The basis of this assertion is that the Games is not an intervention likely to change the context (at least not in the short term, and not without first acting through the various critical steps indicated). The synthesis therefore has strength in simplifying and demystifying the dauntingly complex intervention that the Games can often be viewed as.

9.4. Implications

There are a number of implications arising from this thesis including: that any understanding of how the Games generates change has to account for complexity but also be clear which mechanisms are likely to be impacted upon; that there is little evidence from previous events to inform thinking about what change might occur, but that change in some of the key mechanisms has not been seen in previous events; that it is possible to make policy changes that are likely to improve the chances of positive health and social outcomes arising from the event; and that a modest improvement in evaluation methods has potential to generate a useful improvement in the quality of the evidence base.

Analysis of Government's theory

There are a limited number of mechanisms through which the Games are likely to generate outcomes that are different to other social and health improvement interventions implemented by Government in recent years. The main difference is that the Games are thought to have the potential to catalyse existing programmes in addition to any direct impacts that may occur.

Systematic review

The potential impacts of major sports events are multiple and encompass change in health and most of the determinants of health. However, there was no consistent pattern across different events for a particular impact, nor any single event for which there was good evidence of positive impacts across a range of outcomes. A number of opinion articles have suggested negative impacts including community regeneration, gentrification and rising inequalities.^{44, 50, 55, 67, 200, 229, 230, 257} These

outcomes are not well researched and no conclusion can be drawn from this review about whether they are likely to be associated with future events.

The advocates of hosting major events have suggested that better evaluation of future events is likely to detect benefits, and that most previous events have not sought to generate 'legacy' benefits (and did not therefore attempt 'leverage' such as projects and programmes that utilise the context of the Games to generate positive effects). Clearly both of these could be true, and no two events will ever have exactly the same impacts.

However, the systematic review therefore calls into question whether a 'legacy' from future major multi-sport events can be expected if a similar policy direction is adopted to that of the last 30 years of major multi-sport events.

Health impact assessment

The HIA has made a series of recommendations to maximise the positive impacts of the Games and minimise the negative impacts. The HIA method can be used to engage with the public and policy-makers such that the health agenda is made more explicit and high profile. It is also clear that the Glasgow public are keen to be involved in planning the Games legacy and that, when given opportunities to be involved, they provide a useful and unique insight.

Health impact assessment is an established mechanism for public health professionals to inform policy-making with the available evidence and expertise. This is particularly important for social interventions, not aimed specifically at generating health effects, which are likely to be an important influence on health but may not have sufficient health input into their planning and conduct. There are

precedents for conducting HIAs on major multi-sports events⁴⁶ and there may be an increasing desire for quality public health input to policy-making.⁷³

Evaluating the Games

It is clear that if quality evidence is to be gathered from the 2014 Games then a research framework will need to be developed that takes account of the complexity and variety of the potential outcomes, and which captures the direct, project and catalytic impacts. This will require significant resources, long-term commitment and a high level of research expertise if this is to be achieved.

Synthesis

This thesis has articulated how there is little or no evidence of positive health benefits arising from previous events, and little or no evidence for the positive impacts arising from the 'critical pathways' that influence the determinants of health such as the economy, the urban environment and sports participation.

Of all the critical pathways identified as being the main drivers of positive legacy benefits from the Games, only increased pride, enhanced sense of identity, the new urban village and the limited benefits of the legacy programmes are likely to be realised. It does not seem credible that these will generate catalytic impacts nor positive emergent properties. There is a credible logic that the Games will increase inequalities in income and contribute towards gentrification of an area of Glasgow's East End. There are competing negative impacts of the Games: there is likely to be an opportunity cost to public service provision because of the public sector investment in sports infrastructure and the Games is likely to contribute to a more consumerist mindset amongst the population. It is not likely that a

combination of these factors will generate positive benefits for health or the socio-economic determinants of health for the people of Glasgow.

This raises the question of why there was such enthusiasm for bidding for the Games amongst decision-makers in Scotland. Was it that Scotland's health and social problems were seen to be so intractable and resistant to improvement despite decades of health improvement programmes and regeneration initiatives, such that taking a gamble on the Games generating a positive benefit was worthwhile? Was it that, before the evidence from previous events had been systematically brought together and analysed, decision-makers were under the impression that such events were more likely than not to generate positive benefits? Was it that some of the 'softer' benefits, such as increased pride or sense of identity, for which the 'critical pathway' is less uncertain, was sufficient reason to bid? Or is it that there was an expectation that Scotland would be able to learn from previous events such that it could generate positive benefits that have not been measured in elsewhere?

To consider these questions, there is benefit in reflecting on the wicked issue formulation that has been used by public health academics as a means of describing the complexity and uncertainty surrounding the potential policy solutions to some of the most difficult public health problems. It is implicitly argued that it has allowed academics the space and confidence to discuss policy matters that would otherwise be 'out of bounds'.^{169, 213} If this is true, then it is a welcome advance. However, it may also be that the wicked issue formulation is being used as a mechanism to package some of the most important public health problems as being apolitical and non-ideological for the consumption of policymakers. This has very important implications if it were to prevent academics

from questioning the very fundamental causes that generate such problems (albeit through a plethora of mechanisms in a complex system).²⁵⁸ Many of the critical pathways identified for the impacts of the 2014 Games are ideological and political. There is also a strong public discourse which questions the whole philosophy of bidding for major sports events, although this debate is not yet prevalent in Glasgow.^{67, 229, 259, 260}

The term 'wicked issue' is a term increasingly used when there is a complex health problem in search of a solution, rather than a complex solution (in this case the Commonwealth Games) in the search of its impacts. However, issues that arise from this formulation of wicked issues are common to both. Wicked issues are those: difficult to formulate; lacking boundaries and clear markers of success or failure; difficult to evaluate; complex (particularly in respect to path dependency); have an infinite number of possible solutions (in this case impacts); are essentially unique; and are related to, and dependent on, other problems.²⁶¹ In this way some academics might be tempted to describe the Games as a 'wicked solution'. But it is a 'wicked solution' in the search of a problem to address.

On balance, the 'wicked solution' that is the Commonwealth Games is unlikely to generate net health or socio-economic benefits beyond its opportunity costs, with the possible exceptions of improving citizens' pride and identity in their City. There is also a real danger of unintended consequences of increased inequalities, increased consumerism, gentrification and public sector cutbacks.

The intervention is in-keeping with the neo-liberal ideological mindset of the current political class. Given the lack of evidence of positive impacts, the possible (but unquantified) negative impacts and the opportunity costs (both in terms of

money and the loss of focus from activities more likely to address the fundamental causes of Glasgow's higher mortality),²⁵⁸ it is difficult to come to any other conclusion than that the Games are about providing a 'circus', and not about providing 'bread'.

10. Conclusions

“The definition of insanity is doing the same thing over and over but expecting different results” (possibly) Albert Einstein

The cost of hosting major sporting events such as the Olympic and Commonwealth Games has increased over the last three decades to the extent that it has become difficult to justify the expenditure on the basis of entertainment or national showcasing alone.⁴⁹ Cities competing to host events such as these are now judged on the prospect of a long-term positive legacy being generated for the host population amongst other factors. The limited evidence identified in this thesis questions the realities of the predicted legacy from major multi-sport events.

It is therefore unlikely that the 2014 Games will create positive impacts if the same approach to the implementation of the Games is taken to these previous events. Given that there is a large opportunity cost to playing host, this also questions the wisdom of the bid.

This thesis has argued that major sports events are unlikely to be an effective health improvement intervention and there is a danger that their marketing as such might deflect attention from more important mechanisms of health creation and destruction. The theory for positive impacts depends on a small number of ‘critical pathways’. These pathways have little or no evidence to support their impact, and are similar to many of the previous health and social interventions that have been tried in Glasgow. There is also a real danger of unintended consequences of increased inequalities, increased consumerism, gentrification and public sector

cutbacks. The intervention is in-keeping with the neo-liberal ideological mindset of the current political class.

Given that the Games will be coming to Glasgow in 2014, and that the decision to bid and award the event has been taken, it is reasonable to attempt to maximize the benefits and mitigate the negative impacts that are likely to arise from the event. The health impact assessment has made over 150 recommendations to attempt to influence policy-makers to this effect. The Games has a better chance of generating positive benefits if the legacy planning process adopts these recommendations.

If the actual impact of the Games is to be identified, there will need to be a carefully planned package of studies including: a prospective cohort study or retrospective cohort study for the project effects; a cohort study and ecological study for the direct impacts; an economic model; and a series of qualitative studies to understand why various outcomes are observed and to allow planning of quantitative studies of any catalytic impacts.

A common saying is: "If you do what you always did you will get what you always got". So it is with the 2014 Games. Those responsible for the event should take heed of the recommendations made in the HIA report as a route to minimising the negative impacts of the Games and maximising any positive impacts. Future event organisers should consider major multi-sport events as a risky investment if health or socio-economic legacy benefits are the main justification for playing host.

Appendix 1 - Systematic review search terms

Search	Date	Database	Search terms	Results
#1	22/2/08	Web of Knowledge 1978-Jan 2008	Olympic* NOT (doping or drug abuse or mountain* or dam or peninsula or Washington or Cascade* or Geolog* or marmot*) <i>Referred to as Olympic* X</i>	2873
#2	22/2/08	Web of Knowledge 1978-Jan 2008	Olympic* X and (impact* or effect* or chang* or improv* or difference* or benefit* or value or increas* or reduc* or decreas* or regenerat* or transform* or develop* or renew* or redevelop* or urban) <i>impact terms</i>	934
#3	22/2/08	Web of Knowledge 1978-Jan 2008	Olympic* X AND (health* or well-being or illness* or death* or mortality or morbidity or lifestyle* or smoking or alcohol or diet or weight or obesity or exercise or work or employ* or unemploy* or water or sanitation or housing or econom* or socioeconomic or environment*) NOT #2 <i>health terms</i>	226
#4	22/2/08	Web of Knowledge 1978-Jan 2008	(major or mega* or large* or big* or global* or international*) SAME "sport* event* or "sport* touris*" NOT #2 or #3 <i>megaterms</i>	126
#5	22/2/08	Web of Knowledge 1978-Jan 2008	paralympics or "paralympic games" or "commonwealth games" or "pan-american same games" or "Asian games" or "ASIAD or "African games" or universiade or "world student games" or "world police" and "fire games" or "caribbean games" or "goodwill games" or "mediterranean games" or "arab games" or "jeux de la francophonie" or "lusophony games" or "gay games" or "world out games" or "Games of the Smaller states of Europe" or "pacific games" or "world masters games" or "commonwealth youth games" or "south american games" or "bolivarian games" NOT (#2 or #3 or #4 or Olympic*) <i>other games</i>	130

Search	Date	Database	Search terms	Results
#6	29/2 /08	Web of Knowledge 1978-Jan 2008	Assess* or evaluat* or review* or legac* NOT #2 or #3 or #4 or #5 <i>impact2</i>	51
			Total Web of Knowledge	1465
#7	23/2 /08	Medline/Pre Medline 1978 - Week 3 Feb 08	Olympic X	996
#8			Impact terms	601
#9			Health terms	185
#10			Megaterms	91
#11			Other games	64
#12			Impact2	21
			Total Medline/PreMedline	962
#13	23/2 /08	Embase 1980- 2008 Wk 07	Olympic X	1156
#14		Embase 1980- 2008 Wk 07	Impact terms	565
#15		Embase 1980- 2008 Wk 07	Health terms	148
#16		Embase 1980- 2008 Wk 07	Megaterms	152
#17		Embase 1980- 2008 Wk 07	Other games	62
#18		Embase 1980- 2008 Wk 07	Impact2	38
#19		Emb 1978-1980	All	11
			Total Embase	976
#20	23/2 /08	PsycInfo 1978- 2008	Olympic X	
#21		PsycInfo 1978- 2008	Impact terms	297
#22		PsycInfo 1978- 2008	Health terms	43
#23		PsycInfo 1978- 2008	Megaterms	52
#24		PsycInfo 1978- 2008	Other games	15
#25		PsycInfo 1978- 2008	Impact2	22
			Total PscylInfo	429
#26	23/2 /08	HMIC	Olympic X	12
#27			Mega	2
#28			Other	2
			Total HMIC relevant	7
#29	23/2 /08	ERIC	Olympic X	387
#30			Impact terms	224
#31			Health terms	39
#32			Megaterms	33
#33			Other games	9

Search	Date	Database	Search terms	Results
#34			Impact2	39
			Total ERIC	343
#35	23/2/08	IBSS	Olympic X	448
#36			Impact terms	159
#37			Health terms	36
#38			Megaterms	85
#39			Other games	37
#40			Impact2	6
			Total IBSS	321
#41	23/2/08	Cochrane Database of Systematic Reviews	Olympic X	6
#42			Megaterms	3
#43			Other	0
			Total Cochrane	3
#44	1/3/08	ASSIA	Olympic X	112
#45			All impact terms	57
#46			Health terms	12
#47			Megaterms	17
#48			Other games	0
			Total ASSIA	86
#49	1/3/08	British Humanities Index	Olympic X	1097
#50			All impact terms	230
#51			Health terms	87
#52			Megaterms	24
#53			Other games	1 (irrel)
			Total BHI	337
#54	1/3/08	Sociological Abstracts	Olympic X	428
#55			All impact terms	298
#56			Health terms	41
#57			Megaterms	103
#58			Other games	0
			Total SocAbs	442
#59	1/3/08	Worldwide Political Science Abs	Olympic X	247
#60			All impact terms	112
#61			Health terms	25
#62			Megaterms	11
#63			Other games	0
			Total WPSA	148
#64	1/3/08	Econlit	Olympic (all)	72
#65			Megaterms	25
#66			Other games	7
			Total EconLit	104

Search	Date	Database	Search terms	Results
#67	7/3/08	Sportdiscus	Olympic X (all)	24178
#68			Impact terms 1	3091 (3059)
#69			Health terms (not weightlifting or weight lifting)	2171 (2147)
#70			Megaterms + impact	420 (413)
#71			Megaterms + health	243 (233)
#72			Sports tourism	2646
#73			Sports tourism + big terms	196 (191)
#74			Impact terms 2	1147
#75			<i>Mega +impact 2 not dedup</i>	66
#76			Other games and all impact terms	253
			Total Sportdiscus	7510
#77	11/3/08	Index to Theses	Olympics or Olympic Games	61
#78			Megaevents terms	19
#79			Other games	0
			Total Index to theses	80
#80	12/3/08	Proquest Dissertations and Theses	Olympics or Olympic Games	265
#81			Megaterms	64
#82			Other games	23
			Total Proquest Dissertations	352
#83	12/3/08	COPAC [UK library catalogues]	Olympics in title	484
#84			Olympic games in title	534 (439)
#85			Megaevent terms	1
#86			Other games	204 (130)
			Total COPAC (duplicates removed)	741
#87	12/3/08	WorldCat	Olympics or Olympic Games in title (not juvenile or fiction) and impact terms	225
			Olympics or Olympic Games in title (not juvenile or fiction) and health terms	126
			Megaterms	68
			Other games	299
			Total WorldCat	682 (656)
#88	8/4/08	ESRC society today Advanced search Searching: ESRC corporate content and ESRC awards and outputs	"olympic games"	22
#89			"commonwealth games"	7

Search	Date	Database	Search terms	Results
#90			"sport* events"	4
#91			"mega* event"	0
#92			"paralympic"	1
#93			"pan-american games"	0
#94			"asian games"	0
#95			"asiad"	0
#96			"african games"	0
#97			"universiade"	0
#98			"student games"	0
#99			"world police and fire games"	0
#100			"caribbean games" OR "goodwill games" OR "mediterranean games" OR "arab games" OR "jeux de la francophonie" OR "lusophony games" OR "gay games" OR "world out games" OR "games of the small* states of Europe" OR "world masters games" OR "commonwealth youth games" OR "south american games" OR "bolivarian games"	0
			Total ESRC society today	34
#101	8/4/08	IDOX	Keywords: "olympic games" NOT London NOT Beijing	91
			Keywords: "commonwealth games" NOT Glasgow NOT London	30
			Keywords: "major sport* event**"	46
			Keywords: "mega sport* event**"	17
			Keywords: "international sport* event**"	39
			Keywords: "paralympic**" not London	2
			Keywords: "pan-american games"	0
			Keywords: "asian games"	1
			Keywords: "asiad"	0
			Keywords: "african games"	0
			Keywords: "universiade"	1
			Keywords: "world student games"	16
			Keywords: "world police and fire games"	0
			Keywords: "goodwill games"	1
			Keywords: "mediterranean games"	1
			Keywords: "arab games"	0
			Keywords: "jeux de la francophonie"	0
			Keywords: "lusophony games"	0
			Keywords: "gay games"	0
			Keywords: "world out games"	1
			Keywords: "games of the small states of europe"	0
			Keywords: "pacific games"	0
			Keywords: "world masters games"	0

Search	Date	Database	Search terms	Results
			Keywords: "commonwealth youth games"	0
			Keywords: "south american games"	0
			Keywords: "bolivarian games"	0
			Total IDOX	246
# 102	02/05/08	HUD USER www.huduser.org US Department of Housing and Urban Development	Descriptor: sports events	0
			Descriptor: events	0
			Descriptor: Pan American Games	0
			Descriptor: Impact Evaluation	194
			Keywords: Olympic	4
			Keywords: "Mega Event"	2
			Keywords: Games	7
			Keywords: "International Sport"	3
			Keywords: "sport and impact"	7
			Free text: "Olympic Games"	14
			Free text: "Winter Olympics"	15
			Total HUD USER	256
#103	21/5/08	Urban Age www.urban-age.net	Free text: "sport events"	0
			Free text: events	36
			Free text: "Pan American Games"	0
			Free text: "Impact Evaluation"	0
			Free text: Olympic	8
			Free text: "Mega Event"	0
			Free text: Games	16
			Free text: "International Sport"	0
			Free text: "sport and impact"	2
			Free text: "Olympic Games"	8
			Free text: "Winter Olympics"	0
			Total Urban Age	70
#104	20/6/08	Sapling Info www.sapling.info	Keywords: "sports events"	0
			Keywords: events	159
			Keywords: "Pan American Games"	0
			Keywords: "Impact Evaluation"	0
			Keywords: Olympic	1
			Keywords: "mega event"	0
			Keywords: games	0
			Keywords: "international sport"	0
			Keywords: "sport and impact"	0
			Keywords: "Olympic Games"	0
			Keywords: "Winter Olympics"	0

Search	Date	Database	Search terms	Results
			Total Sapling Info	160
#105	26/6/08	Royal Town Planning Institute www.rtpi.org.uk	Keywords + Document titles (results shown in blue): "sport events"	0
			Keywords + Document titles: events	27
			Keywords + Document titles: "pan American Games"	0
			Keywords + Document titles: "impact evaluation"	0
			Keywords + Document titles: Olympic	0
			Keywords + Document titles: "mega events"	0
			Keywords + Document titles: games	0
			Keywords + Document titles: "international sports"	0
			Keywords + Document titles: "sport and impact"	0
			Keywords + Document titles: "Olympic Games"	0
			Keywords + Document titles: "Winter Olympics"	0
			Total Royal Town Planning Institute	27
#106	16/7/08	The Chartered Institute of Housing www.chi.org	Keywords: Olympic	2
			Keywords: sports events	5
			Keywords: Events	2617
			Keywords: Impact evaluation	50
			Keywords: Mega event	0
			Keywords: Games	7
			Keywords: International sport	5
			Keywords: Sport and impact	1
			Keywords: Olympic Games	2
			Keywords: Winter Olympics	0
			Total Chartered Institute of Housing	2,689
#107	17/7/08	The Centre for Education in the Built Environment www.cebe.heacademy.ac.uk/	Keywords: Olympic	0
			Keywords: sports events	2
			Keywords: events	2
			Keywords: impact evaluation	6

Search	Date	Database	Search terms	Results
			Keywords: mega event	1
			Keywords: games	0
			Keywords: international sport	1
			Keywords: sport and impact	106
			Keywords: Olympic games	0
			Keywords: Winter Olympic	0
			Total Centre for Education in the Built Environment	118
#108	21/7/08	Bubl - social science gateway (Strathclyde University) http://bubl.ac.uk	Keywords: Olympic	8
			Keywords: Sports Events	1
			Keywords: events	457
			Keywords: impact evaluation	0
			Keywords: mega event	0
			Keywords: games	87
			Keywords: international sport	0
			Keywords: sport and impact	
			Keywords: Olympic Games	8
			Keywords: Winter Olympics	0
			Total Bubl	561
#109	22/7/08	The Transportation Research Information Service (TRIS) http://tris.trb.org/about/	Keywords: Olympic	419
			Keywords: Sports Events	9
			Keywords: Impact Evaluation	108
			Keywords: mega event	2
			Keywords: International sport	0
			Keywords: sport and impact	0
			Keywords: Olympic Games	48
			Keywords: Winter Olympics	52
			Total TRIS	638
#110	24/7/08	Scirus www.scirus.com	Keywords: Olympic Games	51
			Keywords: Winter Olympics	1
			Keywords: Sports events	5
			Keywords: Impact Evaluation	3
			Keywords: mega event	9
			Keywords: international sport	1
			Keywords: sport and impact	0
			Total Scirus	70

Search	Date	Database	Search terms	Results
#111	6/8/08	SIGLE http://opensigle.inist.fr/	Keywords: Olympic	29
			Keywords: Impact Evaluation and Sports Events	582
			Keywords: Mega Events and Sport	33
			Keywords: International Sport and Impact	1365
			Keywords: Olympic Games	14
			Keywords: Winter Olympics	1
			Keywords: Commonwealth Games	0
			Keywords: Paralympic	1
			Keywords: World Police and Fire Games	0
			Keywords: Mediterranean Games	0
			Keywords: Jeux de la Francophonie	0
			Keywords: Lusophony Games	0
			Keywords: Gay Games	0
			Keywords: World Out Games	0
			Keywords: Games of the Small States of Europe	0
			Keywords: World Masters Games	0
			Keywords: European Youth Olympic Games	0
			Total SIGLE	2,025
#112	14/8/08	Intute www.intute.ac.uk	Keywords: Olympic Games	216
			Keywords: Mega Events	1
			Keywords: International Sport and Impact	6
			Keywords: Commonwealth Games	17
			Keywords: Paralympic	55
			Keywords: World Police and Fire Games	0
			Keywords: Mediterranean Games	1
			Keywords: Jeux de la Francophonie	0
			Keywords: Gay Games	3
			Keywords: World Out Games	0
			Keywords: Games of the Small States of Europe	0
			Keywords: World Masters Games	1
			Total Intute	300
#113	02/10/08	Google www.google.co.uk	Keywords: Olympic games and impact (Domain .edu)	18,600
			Keywords: Mega Events and impact (Domain .edu)	592
			Keywords: Winter Olympics and impact (Domain .edu)	4,060

Search	Date	Database	Search terms	Results
			Keywords: Olympic games and impact (Domain .ac)	6
			Keywords: Mega Events and impact (Domain .ac)	1
			Keywords: Winter Olympics and impact (Domain .ac)	3
			Keywords: Olympic Games and impact (Domain .gov)	6,600
			Keywords: Mega Events and impact (Domain .gov)	32
			Keywords: Winter Olympics and impact (Domain .gov)	2,400
			Keywords: Olympic Games and impact (Domain. org)	204,000
			Keywords: Winter Olympics and impact (Domain .org)	9,960
			Keywords: Mega Events and impact (Domain .org)	2,960
			Total Google	Not applicable as only first 20 hits screened

Appendix 2 - Critical appraisal of quantitative studies

The critical appraisal criteria for the quantitative studies in the systematic review were adapted from the Hamilton tool)²⁶²

A. Study Design/Allocation Bias		Critical appraisal criterion number
A1. Study Design	Randomised Controlled Trial Cluster Randomised Controlled Trial Prospective Controlled Study Prospective Uncontrolled Study Repeat cross sectional study (interrupted time series or routine surveillance data) Cross sectional study Case Control study Case reports Qualitative study Economic model (computable equilibrium analysis) Economic model (input output model) Other	
A2. Study design characteristics	A = Includes concurrent comparison groups; B = No concurrent comparison groups	1
B. Selection bias		
B1. Study selection	A = Selected study sample very likely to represent population from target area AND $\geq 60\%$ response rate and follow-up; B = Not representative of target population OR response rate or follow-up $\leq 60\%$ <i>[Routine data: Unless it is stated that individual data were taken from routine data specifically for the study population then studies using routine data labeled B]</i>	2
C. Confounders		
C1. Were there important differences between groups prior to the intervention?	A = Comparison groups are matched for key confounders or there is appropriate control for key confounders in the analysis B = Does not meet above criteria	3

C2. Are the statistical methods appropriate for the study design?	A = Yes B = No or not clear	4
C3. Was there an adequate attempt to control for secular trends:	A = Yes B = No or not clear	5
C4. Was there an adequate number of data points?	A = At least two data points before and two data points after the intervention B = Less than two data points before and two data points after the intervention or not clear	6
C5. Was there an attempt to control for regression to the mean?	A = Yes, the outcome of interest was either not an outlier at the beginning of the series or the analysis has taken its outlier status into account B = No or not clear	7
<i>D. Data Collection</i>		
D1. Summary of data collection:	A = Clear description of an established data collection method AND an objective validated outcome measure used (eg SF-36) OR routine national agency data B = Unclear or inappropriate description of data collection method OR non-validated outcome measure	8
<i>E. Withdrawals & Dropouts</i>		
E1. Initial sample size?	Number	
E2. Method of sampling:	Method	
E3. Baseline response?	Number and % of initial sample	
E4. Withdrawals/ drop outs	Numbers and reasons per group	
E5. Are there differences between participants and dropouts?	Describe briefly	
E6. Final response rate:	Number and % of baseline response rate	
E7. Length of follow up:	Number of follow ups and length	
E8. Summary of withdrawals and follow-ups:	A = 80-100% of original sample in final sample; B = Less than 80%/not reported/retrospective study/can't tell (if using routine data which is not linked to individuals or not panel data at end point then B)	9

Appendix 3 - Economic impact assessment critical appraisal tool

		Critical appraisal criterion number
F1. Is the underlying data transparent and valid?	A = Yes B = No	13
F2. What economic model is being utilised and how transparent is it?	Type of economic model	
F4. Extent of estimated data	A = The model is largely utilised actual collected data B = The model is largely dependent on estimated data	14
F3. Accounting for time	A = The model appropriately accounts for changes in values over time B = The model does not take account of changes in values over time appropriately	14
F4. How transparent is the economic model being used?	A = Economic model being used is clear with explicit assumptions B = Economic model being used is not clear and/or the assumptions are not explicit	15
F6. Assumptions in the model	A = The assumptions in the model are valid B = The assumptions in the model are not clearly valid	15

Appendix 4 - Critical appraisal of qualitative studies

The critical appraisal criteria for the qualitative studies in the systematic review was adapted from Dixon-Woods tool.⁹²

		Critical appraisal criterion number
G1. Research questions	A = The research questions are clear and are suited to a qualitative approach B = The research questions are not clear and/or suited to a qualitative approach	10
G2. Sample size	Number	
G3. Method of sample selection	Method	
G4. Data collection method	Method	
G5. Data recorded	A = The data were recorded and transcribed B = The data were not recorded and transcribed	11
G6. Appropriateness of method	A = The sampling, data collection and analysis were appropriate to the method B = The sampling, data collection and analysis were not appropriate for the chosen method	12
G7. Conclusions	A = The conclusions were justified by the data B = The conclusions were not justified by the data	13

Appendix 5 - Levels of evidence

The classification of the level of evidence for the studies included in the systematic review was adapted from the HAD guideline.⁹³ These levels are described below:

Level of evidence	Type of evidence
1++	High quality meta-analyses, systematic reviews of RCTs (including cluster RCTs), or RCTs with a very low risk of bias
1+	Well conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1-	Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias
2++	High quality systematic reviews of, or individual high quality non-randomised intervention studies (controlled non-randomised trial, controlled before-and-after, interrupted time series, repeat cross sectional), comparative cohort and correlation studies with a very low risk of confounding, bias or chance, and high quality economic impact models using valid data
2+	Well conducted, non-randomised intervention studies (controlled non-randomised trial, controlled before-and-after, interrupted time series, repeat cross sectional), comparative cohort and correlation studies with a low risk of confounding, bias or chance, and well conducted economic impact models using valid data
2-	Non-randomised intervention studies (controlled non-randomised trial, controlled before-and-after, interrupted time series, repeat cross sectional), comparative cohort and correlation studies with a high risk of confounding, bias or chance and low quality economic impact models or economic impact models using non-valid data
3	Non-analytical studies (eg case reports, case series)
4	Expert opinion, formal consensus

Appendix 6 - Studies unable to be obtained for the review

The following studies were unable to be sourced during the review period. They are classified below according to the reason for their unavailability.

Unable to identify an institution or author with copy of the study

Conference proceedings

1. Hiller HH. Cities and Mega-Events: Analyzing an Uneasy Relationship. American Sociological Association, 1999, 1999.
2. Holland WW. Fighting the Regime: Homeless Activism and the 1996 Olympics. Southern Sociological Society, 2003, 2003.
3. Hosting the Olympics: the long-term impact: report of the conference. Seoul: Seoul International Conference, 1988.
4. Kolstad A. Do the Olympic Games Promote Mutual Understanding and Internationalism or Ethnocentrism and Nationalism? International Sociological Association, 1998, 1998.

Peer reviewed journal article

5. Floros C. The London Olympic Games Announcement and London Stock Market Reaction. Empirical Economics Letters 2006;5(5):243-250.

Reports and other publications

6. [Olympic impact statements], 1984.

7. APEC. Best practice in sport and recreation for tourism development within APEC economies, 2001.
8. Brewer AMWB. Work-related travel activity and the Sydney 2000 Olympics [sic] Games: a longitudinal study of commuters coping strategies. [Sydney, N.S.W.]: Institute of Transport Studies, Australian Key Centre in Transport Management, the University of Sydney and Monash University, 2001.
9. Brown JA. How the Winter Olympics enrich community legacies for recreational open space: a case study of selected European and American Olympic sites: xiv, 206 leaves.
10. Brunet F. A study of the economics of the 1992 Barcelona Olympic Games. Centre d'Estudis Olímpics: Facultat de Ciències Econòmiques 1992; Bellaterra: 61.
11. Calgary Tourist and Convention Bureau Research Department. Olympic visitor study. Calgary: Calgary Tourist and Convention Bureau Research Department, 1988.
12. Casimiro Andújar AJASVÁSC. Incidencia social de los Juegos Mediterráneos Almería 2005: estudio longitudinal desde el año 2002 hasta después del evento. Almería: Editorial Universidad de Almería, 2006.
13. Changes in air quality and transportation associated with the 1996 Atlanta Summer Olympics : NCHRP 8-33 quantifying air quality and other benefits and costs of transportation control measures. Cambridge, Mass.: Cambridge Systematics, Inc., 1997.
14. Economic impact assessments from the 1984-2000 Summer Olympic Games. US, 1994:[310].
15. Hashimi A. Olympic games: a catalyst for economic growth and urban re-development, 2007.

16. Herpio R. Optio osajille: Helsinki - Lahti - Lillehammer 2006. Organizing the Olympic Games 2006 in Helsinki, Lahti and Lillehammer. The analysis of the economic effects of the event. *Liikunta & tiede* 1998;35(2):4-11.
17. Ibern M. The sport inheritance from the Olympic Games. Barcelona: Centro de Estudios Olimpicos y del Deporte Universidad Autonoma de Barcelona, 1993.
18. Lee SH. The Survey on the Attitudes of the Korean People on the Xth Asian Games. In: Kang S-p, MacAloon JJ, DaMatta R, editors. THE OLYMPICS AND EAST/WEST AND SOUTH/NORTH CULTURAL EXCHANGE.: The Institute for Ethnological Studies, Hanyang University.:pp.
19. Michel A. Economic developments in the Summer Olympic Games. Unpublished Paper:1-11.
20. Millenium Park : legacy of the Sydney Olympics. Green Games Watch 2000 Bondi 2000;Junction: 73.
21. Olympics impact report: effectiveness of transportation strategies implemented during the 1984 summer games in Los Angeles. [Los Angeles]: The Association, 1985.
22. Rigas N. The effect of Olympic games to the real estate markets of host cities, 2003.
23. Sink or swim? Water cycle management for the Olympic Games: community consultation report. Green Games Watch 2000 [Bondi 2000; Junction:13].
24. Sydney 2000 Olympic Games: environmental performance of the Olympic Coordination Authority: review IV. Sydney, NSW: The Council 2001.
25. Sydney State Chamber of Commerce. Sydney 2000: a report on the Olympic impact on business in a host city: State Chamber of Commerce, 2001.
26. XV Olympic Winter Games public transportation operating strategy, final report, April 1988: City of Calgary. Transportation Department. Olympic Transport Group.

Unable to identify an institution or author able to provide remote access to the study

Student theses

27. Davis LK. Reshaping Seoul: Redevelopment, women and insurgent citizenship [Ph.D.]. The Johns Hopkins University, 2005.
28. Jeong G-H. Perceived post-Olympic sociocultural impacts by residents from a tourism perspective: A case study in Chamsil, Seoul, Korea [Ph.D.]. University of Minnesota, 1992.
29. Kemble S. The Olympics and urban development: A study of Seoul, Barcelona and Atlanta [M.a.]. California State University, Fullerton, 2007.
30. Kuziak N. The environmental impact of the winter Olympic games [M.a.]. University of Ottawa (Canada), 1995.
31. Martindale K. To what extent are the modern Olympic Games a catalyst for urban redevelopment?: case study: the 2000 Summer Olympic Games, Sydney, Australia, 2000.
32. Miguelez F. Impact of the Olympic Games on the work market: Barcelona Univ. Autonoma, Bellaterra (Spain)

Reports and other publications

33. Ronningen AH. Analysis of the economic impact of the XVII Olympic Winter Games at Lillehammer in 1994. Lausanne: International Olympic Committee, 1997.
34. Totten GO, Stockholms Universitet. Center for Pacific Asia S. The democratization of South Korea and the role of the Olympics in this process.

Stockholm, Sweden: University of Stockholm, Center for Pacific Asian
Studies, 1988.

Appendix 7 - Full details of the critical appraisal and results for studies included in the review

The studies are listed in alphabetical order according to the lead author's surname or institutional name where appropriate. The notation 'NA' denotes where the box is not applicable to the study.

All studies were critically appraised using the general critical appraisal criteria (1-9) (see appendix 2). Qualitative studies additionally were appraised using criteria 10-12 (see appendix 4) and economic impact studies with criteria 13-15 (see appendix 3). The relevant criteria for each study are listed in the table below with criteria met and not met demonstrated. Where a critical appraisal criterion is not listed it is not applicable to the study. The critical appraisal tool questions relevant to each criterion are shown below the table.

The critical appraisal criteria summarized from the three critical appraisal tools are shown in Table 7.

Table 7 - Coding of the critical appraisal criteria

General critical appraisal criteria	1 = study design includes concurrent comparison groups (A2)
	2 = study sample representative (B1)
	3 = differences between groups accounted for (C1)
	4 = statistical methods appropriate (C2)
	5 = control for secular trend (C3)
	6 = adequate data points (C4)
	7 = control for regression to mean (C5)
	8 = data collection method appropriate (D1)
	9 = sampling and response adequate (E8)
Qualitative study critical appraisal criteria	10 = clear question suited to method (G1)
	11 = data recording appropriate (G5)
	12 = sampling, data collection and analysis appropriate to the method (G6)
	13 = claims supported (G7)

Table 8 - Full details of the studies included in the systematic review including critical appraisal

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Athanasopoulos ¹⁴⁶	Repeat cross sectional study [NA]	2000 Olympics (Sydney)	Level 2+ 4 5 6 7 8 [1]	NA	Funded by Tourism Research Australia and the Sustainable Tourism Co-operative Research Centre	<p>Economy There was a significant increase in domestic business travel in the 3 months following the Games ($p < 0.05$, actual change not reported), but no significant change in holidays, visiting friends or relatives or 'other' forms of domestic tourism (as measured using a questionnaire). The three time series models predict that domestic tourism will either increase by 0.61% or decrease by 1.78% or by 2.11% between 2005 and 2014 as compared with the predicted increase of 8.41% by the Tourism Forecasting Council.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Baade ¹¹⁶	Repeat cross sectional study [NA]	1984 Olympics (Los Angeles) & 1996 Olympics (Atlanta)	Level 2- 1 4 8 [3]	NA	Not stated	<p>Economy</p> <p>The authors report that the Los Angeles Olympics was associated with the creation of 5,043 additional jobs during 1984, but none in other years. The Atlanta Olympics is associated with the creation of a total of 42,448, 21,767 or 3,467 jobs in the 3 models. When opportunity costs and displacement were accounted for, the most optimistic model created an additional 24,742 permanent jobs (a mean of \$63,860 per created job). In the other two models there was a net loss of 4,540 or 29,301 permanent jobs. These figures included full-time and part-time jobs. It is not clear which model fitted the changes in consumption best.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Berman ¹²¹	Repeat cross sectional study [NA]	2000 Olympics (Sydney)	Level 2- 1 4 5 6 7 8 [3]	NA	Not stated	Economy There was an insignificant increase in the 'All Ordinaries Accumulation Index' (overall stock market) trend of 0.8% following the Sydney announcement (p=0.29). Four industry sectors did have a significant change stock market value (Building materials increased by 2.0% p=0.0003; Developers and contractors increased by 2.8% p=0.0001; Engineering increased by 1.8% p=0.033; Miscellaneous services increased by 1.5% p=0.0095). For these four sectors, only the New South Wales-based companies (identified by the location of the head office) had a significant change in their trend value (p=0.02 as compared to p=0.40 for non-New South Wales-based companies). This amounted to an increase of 2.2%.
Brown ¹⁰²	Cross sectional study and Qualitative [13 Local Education Authorities (LEAs),	2002 Commonwealth Games (Manchester)	Level 2- (CSS only) 2 10 [1 8 11 12 13]	The Wider Opportunities Programme (WOP) was a range of initiatives including education projects, festivals,	UK Sport	Recreation It was reported that the involvement of local authorities, local education authorities and sports governing bodies in the WOP was generally low and was limited by funding constraints, a lack of dedicated staff, the lack of capacity within most voluntary sports organisations to harness any benefits of the Games, a lack of ability to retain staff after the Games and poor communication of information. There were a

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
	13 Local Authorities (LAs) & 16 Sport governing bodies (SGBs)]			coaching, volunteering and workshops for sports groups. All LAs participated in the relay and most in the volunteering. Most LEAs participated in the YST topline programme, the spirit of friendship festival and the millennium volunteers project but few in the seminars or conference. The participation of SGBs was generally low with 41% using the curriculum pack and participating in		number of examples of initiatives that provided an ongoing sports development legacy that were created or catalysed by the Games and the WOP. Where these positive impacts were felt, they were described as being close to the Games venues with dedicated funding from local authorities or local education authorities. The inability of many organisations to associate themselves with the Games because of concerns about sponsorship hampered attempts to gain a benefit from the Games (a parallel community branding and sponsorship scheme was suggested to resolve this issue). The trends in the use of the new facilities built for the Games (aquatics centre, tennis centre, squash centre, velodrome and Belle Vue leisure centre) are all positive between opening and 2003/4 (although the 'wet use' of the aquatics centre decreased it was compensated for by a greater increase in 'dry use'). It is not known who is using the facilities and what impact this has had on existing facilities. There is the suggestion that a large proportion of the use has been by elite athletes and by people outwith the local area. The Games stadium was passed to Manchester City FC and generates a revenue stream for sports development work.

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
				<p>the volunteering but much lower proportions for the other initiatives. Participation in almost all the programmes increased between 2001 and 2004.</p>		

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Brunet ¹¹⁸	Repeat cross sectional study [NA]	1992 Olympic Games (Barcelona)	Level 2- 4 8 [1 5 6 7]	NA	Not stated	<p>Housing The mean price of new housing in Barcelona increased from 67,260 to 228,471 peseta/m² from 1986 to 1992 in Barcelona, before decreasing to 230,756 peseta/m² by the end of 1993. The price of other (secondhand) housing rose from 60,163 peseta/m² in January 1986 to 214,230 peseta/m² in June 1991.</p> <p>Economy The retail price index rose by 64.1% in Barcelona, by 53.2% in Catalonia and 51.7% in Spain between 1985 and 1992. Barcelona unemployment decreased from 125,694 in 1986 to 66,295 in 1991 before increasing to 69,941 in 1992, and the number employed increased from 582,078 in 1986 to 656,575 in 1991 before decreasing to 645,833 in 1992. The registered unemployment rate decreased by 47.8% in Barcelona, by 50.6% in the Province of Barcelona, by 46.7% in Catalonia and by 25.8% in Spain as a whole between 1986 and 1992. The population of Barcelona increased by 1.1% between 1986 and 1993. The increase in the number of tourist visitors staying in Barcelona hotels increased steadily from 1,616,484 in 1989 to 1,874,734 in 1992. The number of hotel beds increased from 18,569 to 25,641 between 1990 and 1992 whilst bed occupancy decreased from 58% to 54%.</p> <p>Transport The mean number of passengers during the Olympic period compared with the same period in 1991 increased by 61% for RENFE railways, 64.8% for FGC railways, 53.2% for the</p>

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Decker ¹³⁴	Repeat cross sectional study [NA]	2002 Winter Olympics (Salt Lake City)	Level 2+ 4 5 6 7 8 [1]	NA	Not stated	<p>Crime</p> <p>The demand for police services (as measured by police calls) did not vary significantly between the 73 week pre-event period (4,553/week), the three week event period (4,635/week) and post-event period (4,679/week). Police-generated incidents (i.e. recorded crime) decreased significantly between the pre-event and event period (-15% from 1,344 to 1,141/week; p<0.01) before significantly increasing again between the event and post-event periods (+18% to 1,341/week; p<0.01). Similarly, the rate of arrests significantly decreased between the pre-event and event periods (-47% from 407 to 216/week; p<0.001) and significantly increased between the event and post-event periods (+76% to 381/week; p<0.001). Analysis of the time trends using an 'ARIMA' model and adjustments for seasonality found that there was a significant increase in citizen demand for police services (calls to police) during the Games but also a significant reduction in police recorded incidents and arrests (p<0.001). There was no significant change in the type of crime reported between the time periods.</p>

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Downward ¹³ ₂	Cross sectional study [1,300]	2002 Commonwealth Games (Manchester)	Level 2-4 [1 2 8 9]	NA	UK Sport	Recreation In a study of event volunteers, 6.7% of respondents agreed that they now do more sport (whilst 66.7% disagreed) and 6.0% agreed that they participate in new sports (whilst 74.7% disagreed). 8.3% said they agreed that they do more hours as a sports volunteer and 12.3% agreed that they volunteered for new sports (whilst 74.1% and 67.1% disagreed). 15.6% agreed that they volunteer in a wider range of activities/organisations now whilst 63.4% disagreed.
ERA ¹⁰⁷	Input Output economic model [NA]	1984 Olympics (Los Angeles)	Level 2-4 [1 8 14 15 16]	NA	Not stated	Economy The total economic impact of the Games was \$2.298bn (\$0.766 primary impact and \$1.532 induced impact). This is calculated to have generated 73,375 years of employment and \$1.268bn in wages. \$50m of organising committee surplus was invested in the LAOOC Amateur Athletic Foundation.

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Faber Maunsell ¹⁴⁵	Repeat cross sectional study [NA]	2002 Commonwealth Games (Manchester)	Level 2-4 [1 5 6 7 8]	NA	North-West Development Agency	<p>Economy</p> <p>Employment change in East Manchester (excluding self-employed) increased by 4% (from 33,360 to 34,820) between 1999 and 2000. This was substantially accounted for by increases in public administration, education and health (+14% to 14,090 jobs) and distribution, hotels and restaurants (+14% to 8,230 jobs) despite a reduction in manufacturing employment of 29% (to 5,050). The number of UK residents' trips to Greater Manchester, the North West and England decreased by 6.4%, 2% and 3.9% respectively between 2000 and 2002 whilst the number of trips to these areas by foreigners changed by +7.4%, +3.8 and -4.4% over the same period. The number of UK residents overnight stays in Greater Manchester, the North West and England changed by +7.2%, -3.2% and -5.3% whilst overseas visitor overnights changed by -2.2%, -2.1% and -3.2% between 2000 and 2002. The total tourism spend changed for UK visitors by 21.3%, 17.3% and 4.5% and by 28.9%, 4.0% and -9.2% between 2000 and 2002 for Greater Manchester, the North West and England.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Fidell ¹³⁰	Repeat cross sectional study [22 people in 12 houses]	1996 Olympics (Atlanta)	Level 2- 4 5 6 8 [1 2 7 9]	NA	US air force with additional advice from air traffic services, the civil aviation authority and NASA.	<p>Transport and Environment</p> <p>The number of outdoor noise events in the range of 61dB to 91dB was higher before and during the Olympics than after, and higher in the range of 61dB to 75dB for indoor noise events (although it is not clear if these are rates or if variations in collection time have been accounted for). The number of outdoor noise events for each 5 dB interval during the event was up to 700 more than after the event, and up to 250 more than before the event for each 5dB interval. The excess of number of indoor noise events before the event was up to 200 more than after the event and 100 more than during the event. The mean number of push-button confirmed awakenings was 1.8 per subject-night pre-Olympics; 1.3 during the Olympics; and 1.0 post-Olympics. There was a significant correlation between indoor noise events and arousal ($R^2=0.64$) and outdoor events and awakening ($R^2=0.77$) but no significant correlation between indoor events and awakening or outdoor events and arousal.</p>

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Friedman ⁹⁷	Repeat cross sectional study [NA]	1996 Olympics (Atlanta)	Level 2- 1 4 5 6 7 8 [2] The transport data does not meet criterion 1	Not stated	Not stated	<p>Health</p> <p>The number of acute care childhood asthma events during the Olympics decreased significantly by 41.6% in the Medicaid claims file (RR 0.61 95%CI 0.44-0.85) and decreased insignificantly in an health maintenance organisation file (by 44.1%; RR0.56 (95% CI 0.31-1.02), in two paediatric hospitals (by 11.1%) and in the Georgia hospital discharge database by 19.1% as compared to 4 weeks before and 4 weeks after the Games. It is unlikely that this was due to migration effects since non-asthma acute events varied by between -3.1% and 1% only. Peak daily ozone concentrations decreased by 27.9% (p<0.001) and peak weekday traffic counts by 22.5% (p<0.001). Traffic counts were correlated with ozone concentration (r=0.36) and meteorological conditions did not differ substantially from the base period.</p>

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Giesecke ¹¹⁷	Computable general equilibrium economic model [NA]	2000 Olympics (Sydney)	Level 2- 4 5 6 7 15 16 [1 2 8 14]	NA	Not stated	<p>Economy</p> <p>There was a 12% increase in tourism demand (economic spend) in New South Wales during the year of the Games in comparison to the rest of Australia, but the demand was 2.2% lower for the next three years before becoming equivalent. There is therefore no evidence for an induced tourism impact beyond the year of the event. The CEA model concludes that the economic impact on Australia is negative (in present value terms \$2.1bn for Australia accounted for by a -0.04% deviation from real GDP baseline from 1997 to 1999, -0.06% until 2001 and -0.01% until 2006). There was no impact on Australian employment, although consumption decreased and investment increased. For New South Wales there was an increase in real GDP of 0.19% from 1997 until 2001 (except for 1999/2000 for which it was 0.08%), before decreasing to -0.02% in 2001/2 and then stabilising at -0.01% until 2006. This was largely due to increased investment and was offset by sustained large decreases in real private and public consumption.</p>
Giuliano ¹²⁷	Cross sectional study	1984 Olympics (Los Angeles)	Level 2- Nil	General transport system management	California Department of Transport	<p>Transport</p> <p>During the Olympics between 15.9% and 23.9% of respondents did not work at their regular</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
	[4,900]		[1 2 4 8 9]	<p>consisted of: venue site traffic management; spectator information; freeway closure management; public information campaign for commuters, businesses and shippers; system traffic management including removal of roadworks and opening auxiliary lanes; and system monitoring. For trucks there was: a temporary withdrawal of restricted night deliveries; a</p>		<p>workplace. The proportion on vacation ranged from 9.5% to 13.8%; the proportion utilising an alternative workplace varied between 2.8% and 3.7%; with smaller proportions modifying their working week pattern, being off sick or not attending work for other reasons. The mean commute to work during the games took 36.8 minutes (5.6 minutes/14% less than normal) and commute home took 42.2 minutes (6.4 minutes/13% less). 23.3% of respondents left for work earlier than usual; 65.1% at the same time; and 11.6% later. 17.9% of respondents left for home earlier, 72.6% at the usual time and 8.2% earlier than usual. There was a flatter and earlier distribution of the proportion of people leaving for, and arriving home from, work during each half hour time period in the mornings (with higher proportions in the earlier time periods and a smaller overall peak). The proportion of employees that had their working hours specified for them reduced from 56.2% before the Olympics to 41.3% during the Olympics. The window of allowed arrival and departure times to and from work was widened during the Olympics compared to other times. The number of stops made by respondents was almost unchanged on the way to work (27.3% to 27.4%)</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
				voluntarily agreement with Teamsters Union to accept regular wages for night shift; and legislation passed to allow certain commodities to be delivered at night. The degree to which this was implemented was not stated.		and decreased (39.9% to 37.5%) on the way home during the Olympics.

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Hallenbeck ⁶³	Repeat cross sectional study [NA]	1990 Goodwill Games (Seattle)	Level 2- 2 6 [1 4 7 8]	NA	Not stated	<p>Transport</p> <p>The impact of the Games on traffic volumes in Tacoma and Seattle was not statistically different from before or after the event in all but three monitoring locations (where traffic volumes were significantly lower by approximately 2,500-3,000 vehicles per day), although specific traffic incidents caused congestion on some days. Traffic speed was unchanged at Tacoma but increased on the SR-520. Bus passenger numbers increased by 10% in comparison to the previous year. Requests for transport information overwhelmed supply (both Metro and road traffic inquiries). There is a suggestion that the increase in traffic patrols identified and dealt with incidents more rapidly. There is evidence that people changed their transport plans as part of a mitigation strategy.</p>

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Hargreaves ⁴¹	Repeat cross sectional study [NA]	1992 Olympics (Barcelona)	Level 2- 1 [2 3 4 5 6 7 8]	NA	ESRC and Leverhulme Foundation	Culture The proportion of the Catalan population identifying themselves principally with Catalonia decreased from 45% to 37% between 1990 and 1996 at a time when regional identification had increased elsewhere in Spain from 20% to 21%. The corresponding identification with Spain increased from 16% to 24% amongst Catalans at the time when Spanish identification elsewhere remained constant at 27% between 1990 and 1996.
HBOS ¹³⁵	Repeat cross sectional study [NA]	1992-2004 Olympic Games	Level 2- 4 [1 5 6 7 8]	NA	HBOS (mortgage lender)	Housing There were house price increases of 49%, 7%, 11% and 9% in Barcelona, Atlanta, Sydney and Athens respectively in the 5 years before hosting the Games in addition to the national increase in house prices in these nations.

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Hensher ¹²⁹	Repeat cross sectional study [NA]	2000 Olympics (Sydney)	Level 2- Nil [1 2 4 5 6 7 8]	NA	Not stated	Transport The mean travel time during the Games was substantially reduced as compared with the previous year. The reductions were from 64 to 33; 57 to 28 and 80 to 57 minutes for the M4/Parramatta Road, Victoria Road and Cumberland Highway respectively in the morning. The afternoon reductions were from 56 to 33 and from 45 to 35 minutes from the M4/Parrameter Road and Victoria Road. No afternoon data from the Cumberland Highway is presented.
Hiller ¹³⁶	Repeat cross sectional study [NA]	1988 Winter Olympics (Calgary)	Level 2- 6 7 8 [1 4 5]	NA	Not stated	Housing The population of both Victoria Park Stampede and Victoria Park East declined steadily from 546 and 2,593 in 1968 to 12 and 825 respectively in 1997. This decline is reflected in a similar decline in housing units from 228 in Victoria Park Stampede and 1,204 in Victoria Park East in 1968 to 7 and 414 respectively in 1997. It is suggested that these declines resulted from the pursuit of mega-events since property speculation was encouraged and investment discouraged.

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Hopkins ¹³⁷	Repeat cross sectional study [NA]	1996 Olympics (Atlanta)	Level 2- 48 [1 2 5 6 7]	The intervention was the creation of the urban camping ordinance (law). The degree to which this was implemented is reported in the outcomes.	Not stated	<p>Housing</p> <p>279 citations were issued under the urban camping ordinance over 12 months with a higher incidence in the mornings (69% between 7am and 1pm) and in the summer months (with July accounting for 25% of the total number). 58% of the citations were issued following arrests in public parks, with 27% of the total in the park at 419 Peachtree Street (opposite a homeless centre). 73% of the citations were issued to African Americans, 24% to Caucasians and 2% to Latinos. 94% of the citations were issued to males. Only 12% of the citations were issued to repeat offenders. 20% of those arrested provided an address within the Atlanta metropolis although many of these were found to be invalid. The number of citations used against homeless people was less than expected given that there is an estimated 15,000 homeless in Atlanta each night.</p>

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Hotchkiss ¹⁰⁸	Repeat cross sectional study [NA]	1996 Olympic Games (Atlanta)	Level 2- 1 4 5 6 7 8 [2 3]	NA	Nil	<p>Economy Employment increased 17% more in counties close to Games venues as compared to venues distant to venues within Georgia ($p < 0.01$). The evidence on differences in wages (7% increase in comparison to areas distant to venues) cannot be attributed to the Games because of the high degree of variability in the wages data. The effect was not simply due to metropolitan growth since a comparison of the Atlanta area with other Southern USA metropolitan areas revealed an 11% ($p < 0.01$) increase in employment.</p>

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Indig ⁹⁹	Repeat cross sectional study [NA]	2000 Olympics (Sydney)	Level 2- 4 6 [1 2 5 7 8]	NA	Not stated	<p>Health</p> <p>The mean daily number of presentations to hospital with illicit drug related problems was significantly more ($p=0.04$) during the Olympics with 13.3 compared with 8.8 in the 2 weeks beforehand. Presentations peaked 24 hours after the closing ceremony (at 35/day) and were higher at the weekends (16.6 compared to 9.2, $p=0.001$). There was a significant increase in mean daily presentations for ecstasy and amphetamines (5.1 compared with 1.7, $p=0.007$) but not for heroin (4.5 compared with 4.2, $p=0.8$) during the Olympic period compared with the two weeks prior to the Olympics. Most of the presentations were in males (67%) and young people (61% of men and 69% females were under 30 years). Over 90% of presentations were Australian residents and 83% were from the Sydney metropolitan area. Two deaths were recorded (one related to heroin and one to ecstasy). The recordings for the Olympic surveillance system were significantly different from the routine hospital system limiting comparisons with other time periods.</p>

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ISER ²⁶⁴	Input output economic model [NA]	2001 Special Winter Olympics (Anchorage)	Level 2- 4 [1 2 8 14 15 16]	NA	Not stated	Economy \$18.8million was added to the Alaskan economy as a result of the Games, equivalent to 379 jobs for a year. The greatest number of jobs created was in retail (75), construction (36) and business services (31). The construction impacts were seen prior to the event and many of the retail impacts during and after. The Anchorage Municipality received \$0.18million additional revenues from various taxation sources.
Kang ¹⁴⁴	Repeat cross sectional study [NA]	1988 Olympics (Seoul)	Level 2- 1 4 8 [5 6 7]	NA	Not stated	Economy The regression model fit improved from 0.457 to 0.655 in the five country model (South Korea, Japan, Taiwan, Hong Kong and Thailand) and from 0.348 to 0.438 in the four country model (excluding Thailand) with the addition of the mega-event variable, indicating an important impact of the Olympics in explaining tourism trends (p<0.05). The modeled impact of this is an increase in tourism market share of 1.2% in the year of the event, 3.5% in 1989 and 2.8% in 1990 (and falling steadily thereafter). This amounts to a (direct) economic impact of \$1.3billion for these three years. No total impact is presented.

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Kasimati ¹⁰⁵	Macro-economic model [NA]	2004 Olympics (Athens)	Level 2+ 4 5 6 7 8 [1]	NA	Funded by IOC and Greek ministry of national economy and finance	Economy The GDP growth attributable to the Games between 1997 and 2005 was a mean of 1.34% per year. Unemployment decreased by a mean of 1.88% per year from 1997 to 2005 as a result of the Games (amounting to a reduction of 86,300 individuals per year). The model predicts that the additional GDP growth resulting from the Games between 2006 and 2012 will be a mean of 0.49% whilst unemployment will fall by 0.17% per year (7,700 individuals per year).
Kemp ²⁶³	Cross sectional study [400]	1994 Winter Olympics (Lillehammer) & 2000 Olympics (Sydney)	Level 2- Nil [1 2 3 4 8]	NA	Not stated	Volunteering Most volunteers perceived that they had developed social skills and personal networks (64.5%), acquired job skills (79% in Lillehammer and 88% in Sydney) and enhanced their knowledge about society (55%).
Kim ¹⁰⁹	Input output economic model [NA]	1988 Olympics (Seoul)	Level 2- Nil [1 4 5 6 7 8 14 15 16]	NA	Not stated	Economy The total economic impact between 1982 and 1988 is calculated as being 2,383 billion won (1,108 billion won as direct impacts and 1,274 billion as indirect impacts) and 336,000 jobs. This is equivalent to 0.4% of GNP and 0.3% of total employment over the same period. GNP grew by 5.4%, 12.3%, 12.0%, 12.1% and 8.5% between 1985 and 1989.

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Kolstad ¹⁴⁰	Repeat cross sectional study [NA]	1994 Winter Olympics (Lillehammer)	Level 2- Nil [1 2 4 5 6 7 8]	NA	University and Olympic documentation service	Culture There was no significant change in the value systems of the Lillehammer residents after the Games.
KPMG ²⁶⁶	Computable general equilibrium model [NA]	2006 Commonwealth Games (Melbourne)	Level 2+ 4 8 14 15 16 [Nil]	NA	Office of the Commonwealth Games Coordination	Economy There was an increase in Gross State Product of \$1.6bn over 20 years and an additional 13,000 person years of FTE employment, with a total of 22,000 casual jobs during 2006.

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Lee ¹²⁶	Repeat cross sectional study [NA]	2002 Asian Games (Busan)	Level 2- 8 [1 4 5 6 7]	Restriction of passenger vehicles to alternative day operation only during the event (based on registration plate numbers). The implementation of this is not stated other than vehicle counts.	University of Ulsan, Korea	<p>Transport and Environment</p> <p>Passenger vehicle numbers decreased by 4.7% (+/-0.8%) during the study period (29/9/02-14/10/02) as compared to the periods before and after (13/9/02-28/9/02 and 15/10/02-30/10/02). Mean vehicle speeds increased during the Games from 24.6 to 28.3km/h. Carbon monoxide (CO) levels during the Games were 1.25, nitrogen dioxide (NO₂) 1.45, ozone (O₃) 1.01, PM10 (particles measuring 10µm or less) 1.78 and sulphur dioxide (SO₂) 1.40 times the levels of the period before the Games.</p> <p>Meteorological conditions were more conducive to the accumulation of air pollution during the Games and this may provide some explanation for the otherwise paradoxical outcomes.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Lee ⁹⁶	Repeat cross sectional study [NA]	2002 Asian Games (Busan)	Level 2+ 2 4 5 6 7 8 [1]	Restriction of passenger vehicles to alternative day operation only during the event (based on registration plate numbers). The degree to which this was implemented was not stated.	Supported by Ministry of Environment	Health, Transport and Environment The relative risk of hospitalization for asthma during the post-Games 3 week period over the baseline period (the three weeks before the Games and the 16 days of the Games) was 0.73 (95% CI 0.49-1.11). In 2003 the relative risk of admission between the time periods was 1.78 (95% CI 1.27-2.48). Air pollution was reduced by 1-25% in the post-Games period compared to the Games and pre-Games period in 2002. This was in contrast to rises in pollutants comparing the time periods in 1999, 2000, 2001 and 2003 with the exception of ozone (O ₃) which decreased in the comparison for each year except 2003. There was no difference in weather variables between the comparison years. The relative risk of admission was significantly associated with nitrogen dioxide (NO ₂) (1.35 95% CI 1.01-1.80), sulphur dioxide (SO ₂) (1.34 95% CI 1.06-1.68), PM10 (particles measuring 10µm or less) (1.34 95% CI 1.13-1.60) and ozone (O ₃) (1.24 95% CI 1.04-1.48) but not with carbon monoxide (CO) (1.01 95% CI 0.74-1.38).
London East Research Institute ²⁶⁷	Repeat cross sectional study	1992-2004 Olympic Games	Level 2- 1 5 6 8 [2 3 4 7]	NA	Funded by the London Assembly	(Figures are approximations read from graphs) Tourism Tourist arrivals in Barcelona increased from 1.7m in 1989 to 3.6m in 2002, with the biggest

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
	[NA]					<p>increase in 1993 and a dip between 1995 and 1999. The number of visitors to Atlanta increased from 6.1m in 1993 to 7.3m in 1995 before decreasing to 6.7m in 1996. The number of conventions in Atlanta increased from 1,623 in 1988 to 2,280 in 1996 whilst bed occupancy increased from 62% to 68%. The trend in the number of international visitors to Australia is difficult to determine from the data presented between 1999 and 2002. The variations in the GVA (gross value added) in Barcelona closely resemble the variations for Spain between 1987 and 2004 with the exception of 1995 which is higher for Barcelona.</p> <p>Economic</p> <p>Gross fixed capital formation in Spain varied between 1986 and 2002 (increasing from 1986 to 1990 before slightly decreasing and leveling out) with no corresponding variation in Barcelona. Gross fixed capital formation increased in Greece between 2000 and 2004 by approximately \$7bn (2000 US\$) and Attica (Athens region) by \$5bn over the same period. GDP in Attica increased by 25% in 2000 whilst Greek GDP increased by 3%. The annual change in GDP was similar for the other years between 1996 and 2004. Median household income rose faster in</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
						<p>Atlanta than the US city mean between 1979 and 1999 but remained lower. The Atlanta mean household income decreased from around \$38,000 in 1999 to around \$37,000 in 2005 (2000 \$). Mean individual income decreased by around 2.5% in Sydney in 2002 in contrast to an increase of around 1% in Australia, but increased by around 1.5% in 2003 whilst Australian income decreased by around 0.5%.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
London East Research Institute ²⁶⁷ (continued from above)						<p>The proportion of households in the lowest income quintile was higher in Atlanta than in other US cities between 1969 and 1999 with a large increase in Atlanta from 24% to 34% between 1969 and 1979 before declining steadily to 29% by 1999. The US city average increased steadily from 22% to 24% from 1969 to 1999. The mean unemployment rate for Barcelona was comparable to Spain between 1989-1993 (approximately 15%) and 1999-2003 (approx 10%) but was higher between 1994 and 1998 (20% v 12.5%). The unemployment rate in Atlanta was approximately 1% lower than the US mean and fluctuated in parallel with it between 1990 and 2004 before becoming the same as the US rate in 2005. The unemployment rate in Sydney was approximately 1.5% lower than the Australian average in 2001 with the gap narrowing to less than 0.5% by 2004 against a general declining trend for both. Unemployment in Attica (Athens region) was approximately 0.5% higher than in Greece as a whole in 1999 before steadily declining to become approximately 1% less than Greece by 2005 against a declining trend for both. Inflation in Barcelona mirrored that of Spain between 1986 and 2006 with the exception of 1989-1994 where the rate was 1-2% higher, peaking in 1992. The inflation rate in Atlanta was approximately 1% below the US city average between 1990 and 1992 and from 2002 to 2005 and mirrored the US city average between 1992 and 2002. The New South Wales inflation rate was almost identical to the Australian inflation rate from 1996 to 2005.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
London East Research Institute ²⁶⁷ (continued from above)						<p>Housing</p> <p>House prices in Barcelona rose from approximately (US) \$1,250/m² in 1989-93 to \$2,600/m² in 1999-2003. The average house price in Atlanta was approximately the US city average in 1990 but rose by approximately \$50,000 by 2000 whilst the US city average rose by approximately \$25,000. The Atlanta average house price then rose by another \$70,000 by 2005 but there is no US city comparator given. Australian and New South Wales house prices rose between 1996 and 2005, with the most rapid rise between 2002 and 2004 (from approximately \$10,000 to \$17,000) with the gap between to the Australian prices from the higher NSW prices rising from approximately \$2,000 to \$4,000 over the series.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Lumsdon ¹⁵⁰	Qualitative [not clear]	2002 Commonwealth Games (Manchester)	Level NA 10 11 13 [1 2 8 9 12]	NA	Not stated	<p>Volunteers</p> <p>Some volunteers felt that they received inadequate training and some that there was inadequate supervision. There was concern expressed that too much time was spent rehearsing or between tasks and that volunteers were frequently under-utilised or were not appreciated sufficiently by the paid staff, management or in respect to organisational arrangements such as breaks and catering. Some volunteers described strong feelings of comradeship and appreciation from the public. There was no significant change in the type or extent of volunteers' participation in sport or voluntary work between the pre-event survey in 2002 and 2003.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Lybbert ¹¹¹	Repeat cross sectional study [NA]	1980 & 1988 Winter Olympic Games and 1984 & 1996 Olympic Games	Level 2- 1 4 5 6 7 [2 3 8]	NA	Not stated	<p>Demography and Economics</p> <p>Net migration to all of the Olympic regions is positive [1.63% (95% CI -1.81%, 6.86%) net increase before the Games and 0.84% after (95% CI -1.29%, 6.21%)] with the Summer Olympics having a larger positive effect [2.17% before the Games (95% CI -0.04%, 6.86%) and 1.71% after the Games (95% CI -0.70%, 6.21%)] than the Winter Olympics [0.84% before the Games (95% CI -1.81%, 6.54%) and 0.13% after the Games (95% CI -1.29%, 6.21%)]. The regression models suggest that employment increased by around 1% before and after the Games and that per capita economic growth may be negative at -1% before and -1.3% after the event although the derivation of these results is much less clear.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
MORI ¹⁰⁰	Repeat cross sectional study [4,084 (2002); 4118 (2003)]	2002 Commonwealth Games (Manchester)	Level 2- 1 4 [2 3 5 6 7 8 9]	NA	Not stated	<p>Recreation</p> <p>The proportion of the population participating in sports activities (except walking) 4 or more times in the 4 weeks after the Games compared with before insignificantly decreased across the 4 sample areas when combined (-2.0% (95% CI -4.1% to 0.0%)); and decreased significantly in Blackburn [-9.0% (95% CI -13.2% to -4.7%)]; decreased insignificantly in Liverpool [-3.0% (95% CI -7.3% to 1.3%)] and Greater Manchester [-3.0% (95% CI -7.3% to 1.3%)]; and increased significantly in Congleton (7.0% (95% CI 2.7% to 11.3%)); representing an increasing socioeconomic difference. The proportion participating in sport at least once in the last 12 months decreased in 2 areas [Greater Manchester by 2.0% (95% CI -6.4% to 2.3%) and Blackburn by 11.0% (95% CI -6.7% to -15.3%)], was static in Liverpool (0.0% change, 95% CI -4.3% to 4.3%) and increased by 7.0% (95% CI 3.0% to 11.1%) in Congleton. Participation rates were higher for men than women and in the higher social classes. Volunteering rates increased by 3% in Congleton and Liverpool, remained static in Manchester and declined in Blackburn (reported narratively).</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Mount ¹²⁴	Cross sectional study [650]	1988 Winter Olympics (Calgary)	Level 2- 2 [1 4 8 9]	NA	Calgary Convention and Visitors Bureau	Economy 91% of respondents said that the upcoming Olympics had no effect on the planning of their new business. 56% reported some positive effect from the Olympics and 14% reported that they get business from the Olympic facilities or the athletes they attract. Those reporting these positive effects tended to be the larger companies with sales of greater than \$1million per annum.
Newby ¹⁰³	Repeat cross sectional study	2002 Commonwealth Games (Manchester)	Level 2- 1 [2 3 4 5 6 7 8]	NA	Not stated	Economy Unemployment in East Manchester declined from 18.1% to 9.8% between 1996 and 2002 in proportion with the national and regional declines (Manchester declined from 8% to 4%; North West England from 7% to 3%; Great Britain from 6% to 3% (all figures approximate as read from graphs)). The proportion of people with a perceived net household income (excluding housing benefit) of >£200 per week in East Manchester increased from 17% to 34% between 1999 and 2002 and the proportion perceiving themselves to be in financial difficulty decreased from 49% to 26%. Recreation Resident satisfaction (not clear which residents) with the provision of parks and green spaces

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
						<p>increased from 28% to 75% between 1999 and 2002.</p> <p>Crime Reported vandalism to own property decreased from 19% to 13% between 1999 and 2002.</p> <p>Housing Resident satisfaction with access to supermarkets increased from 75% to 89%; the proportion believing the area is improving increased from 17% to 52%; the proportion believing the area is getting worse decreased from 52% to 30%; reported satisfaction with their home increased from 75% to 82%; and reported their home was in good condition increased from 53% to 75% between 1999 and 2002. It is not clear whether all the relevant outcomes from the residents perceptions survey have been reported and which residents are being referred to.</p>
O'Brien ¹²²	Qualitative [74]	2000 Olympics (Sydney)	Level NA 10 11 12 13 [Nil]	The intervention consisted of networking initiatives in three Australian regions (Canberra, Hunter Valley	Not stated	<p>Economy The Hunter Valley region developed numerous business links, as perceived by stakeholders, due to an explicit business networking strategy based on the visit of Olympic teams to pre-event training camps in the areas. This was seen to a lesser extent in the Gold Coast and Canberra who viewed the visits as more sports orientated</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
				<p>and Gold Coast). Canberra and the Gold Coast based their initiatives within sport departments and Hunter within the economic department. Hunter had a more explicit strategy of creating business networks whilst Canberra and Gold Coast were interested more in attracting public investment in facilities and in training camp visitation. Canberra outsourced the tasks of co-ordinating pre-</p>		<p>and either outsourced the co-ordination or left it to the Sports Department. The positive networking results perceived in Hunter were tempered by the failure to maintain the co-ordinating group or the employment contract of the main facilitator after the event. This study confirms that many perceive the Sydney Olympics as a prime business networking opportunity.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
O'Brien ¹²²	Qualitative [92]	2000 Olympics (Sydney)	Level NA 10 11 12 13 [Nil]	Games training. The interventions were business leveraging initiatives associated with the Games including: Australia Open for Business; Business Club Australia; Australian Technology Showcase; Olympic Business Roundtable; and The Business Project. Most of these were perceived to have been implemented as planned.	Funded by Sustainable Tourism Cooperative research centre with is an Australian Government initiative	Economy There was a concerted effort by government agencies and business to gain a positive impact from contact with business representatives from across the world at the Sydney Games. Reflection on these attempts suggests that most is to be gained from the creation of sustainable networks rather than from trade during the Games. It is suggested that effective business leveraging requires: strategic activity aimed at the identification of sports tourists and the networks that they inhabit; attention to integrative structures that facilitate collaboration between businesses; creation of a supportive environment for learning and relationship building; and recognition of the complexity of the networks present at a mega-event.

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Owen ¹³⁸	Qualitative [11]	2000 Olympics (Sydney)	Level NA 10 11 12 [13]	NA	Not stated	Democracy Features of governance in the run up to the Sydney Olympics included: centralisation of planning powers, the increased involvement of the private sector in government activities, relaxation of the planning process, reduced transparency, reduced accountability and reduced public participation. This loss of democracy was tempered where civic activism was present. Those communities where activism was a feature were more likely to secure significant benefits from the Games.
Pitts ¹¹²	Input output economic model [NA]	1998 Gay Games (Amsterdam)	Level 2- Nil [1 2 4 8 14 16]	NA	Not stated	Economy The direct economic impact on Amsterdam was \$350.7million based on a median daily expenditure of \$146 for 10 days, with an additional 5 days spent in neighbouring cities, and 11,610 participants (after adjusting for casuals, time switchers and locals); and 197,250 visiting spectators.
Potter ¹²⁵	Repeat cross sectional study [NA]	1996 Olympics (Atlanta)	Level 2+ 5 6 7 8 [1 4] The data for ozone meets	The traffic management arrangements consisted of: supplementary public transport (including 24	Not stated	Traffic and Environment Total daily traffic volumes (as compared to the mean for June 1st - August 31st excluding the Olympic period of July 13 - August 1st) were reduced by 0-10% during the first week of the Olympic period with some locations recording an increase and some a decrease of up to

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
			<p>criterion 1 but not 2 or 3</p>	<p>hour bus and rail, park and ride with express buses to venues and additional services); a demand management campaign (encouraging alternative commuting habits); additional high occupancy vehicle lanes and Intelligent Transportation System infrastructure; and traffic restrictions in central Atlanta. The degree to which this was implemented was not stated.</p>		<p>approximately 7% in the second week. Peak traffic volumes were substantially lower (approximately 5-30%) during the Olympic period and during the previous week. The statistical significance of these results was not tested. There was a statistically significant (level not stated) mean reduction in ozone in the Atlanta test sites of 18% during the Olympic period as compared to the rest of the summer. It is not clear what confounding is represented by the meteorological data in the model. There were large decreases in ozone levels in the comparison areas in neighbouring states of 10-28%. The prevailing wind during this time was westerly indicating that the largest reductions could not be accounted for by a reduction in emissions from Atlanta. It is therefore unclear as to whether the reduction in ozone levels was due to prevailing meteorological conditions, reduced traffic or other factors.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Preuss ⁵⁰	Repeat cross sectional study [NA]	2000 Olympics (Sydney)	Level 2- 1 5 8 [2 3 4 6 7]	NA	Not stated	Economy The cost of living increased in Australian cities (Sydney, Melbourne, Brisbane, Adelaide, Perth) in equal measure during Olympic year (an approximate 6% rise in prices) before returning to pre-event levels (approximately 3%) in the following two years. Sydney did not experience a differential effect.
Searle ¹¹⁹	Repeat cross sectional study [NA]	2000 Olympics (Sydney)	Level 2- 8 [1 2 4 5 6 7]	NA	Not stated	Economy New South Wales capital expenditure on recreation and culture increased by 144.2% in the period 1996/7-1998/9 as compared to 1993/4 to 1995/6. This compares to an increase of 1.6% in health capital expenditure and a decrease of 18.1% in education capital expenditure. Capital expenditure in the period 2000/1 to 2002/3 compared with the period 1996/7 to 1998/9 decreased by 65.1% for recreation and leisure and increased by 7.7% and 40.5% for health and education capital expenditure respectively.

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Shin ⁹⁵	Repeat cross sectional study [NA]	1988 Olympics (Seoul)	Shin 2+ 4 5 6 7 8 [1]	NA	Not stated	Health Against a backdrop of a seasonal but declining suicide rate, there is no evidence to suggest a change in suicide behaviour at the time of the Olympics. The proportion of variation explained by the addition of the Olympic variable was 0.04% and insignificant.
Simon ⁹⁸	Cross sectional study [NA]	1996 Olympics (Atlanta)	Level 2- 4 [1 2 8]	NA	Not stated	Health 263 children from outwith the local catchment area were seen between the 13th July and the 13th August 1996. The mean age was 6.7 years. 24% were seen in tertiary care centres and 76% in urgent care centres. The children originated from 23 countries with 15 primary language. 44% were uninsured and the proportion requiring admission were higher than proportion of local residents (27% vs 13% at the tertiary hospital and 7% vs 3% at the country hospital).

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Smith ¹¹⁴	Repeat cross sectional study and Qualitative [RCS is NA; Qualitative = 20]	2002 Commonwealth Games (Manchester)	Level 2- (RCS only) 4 8 10 [1 2 11 12 13]	The intervention was the Legacy Programme funded by Single Regeneration Budget managed through Local Authorities and City Councils. The degree to which it was implemented was not stated.	Not stated	Economy The legacy programme was reported to have created 220 jobs; generated recognised qualifications for 3,092 people; assisted 8,473 businesses; helped 913 voluntary organizations; and encouraged 2,607 individuals to participate in voluntary work. It was suggested that projects helped engage people better than previous initiatives. Teenagers, ethnic minorities, retired and people with special needs were perceived to have been given opportunities to access training and employment experience. It was also perceived to have raised aspirations, confidence and self esteem, fostered a sense of regional identity, broken down barriers and enhanced community organisations. Four of seven projects were still continuing to be delivered at the time of the study.
Spilling ¹⁴²	Repeat cross sectional study [NA]	1994 Winter Olympics (Lillehammer)	Level 2- 1 3 8 [2 4 5 6 7]	NA	Norwegian government	Economy The annual number of guest nights increased by 100% between 1989/90 and 1995 for Lillehammer and its two neighbouring municipalities (59% in Lillehammer; 225% in Oyer and 76% in Gausdal). This is a rise from approximately 400,000 to 800,000 bed nights.

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
State of Utah Governor's office ²⁶⁸	Repeat cross sectional study [NA]	1988 Winter Olympics (Calgary) and 1996 Olympics (Atlanta)	Level 2- Nil [1 4 5 6 7 8]	NA	Funded by State of Utah	<p>Economy</p> <p>The occupancy rate for Atlanta's lodging industry was slightly lower in 1996 at 68% than in 1995 when it was 71%, although revenue during July and August was higher in 1996 (\$1.3bn) than in 1995 (\$1.1bn) with most of the excess gained during the Olympic months. Revenues were 5-10% higher in 1997 than in 1995. The number ski visits dropped by approximately 20% in Calgary during January and February in 1988 as compared to 1987 but otherwise followed an almost identical trend.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Sterken ¹¹⁵	Repeat cross sectional study [NA]	1984 - 1996 Olympic Games	Level 2- 1 4 5 6 7 8 [2 3]	NA	Not stated	<p>Economy</p> <p>Host nations for the Summer Olympic Games between 1984 and 1998 (inclusive) experienced median percentage excess real GDP growth of -0.682, -0.492, -0.256, 0.144, 1.241, 1.345 and 0.644 in the 7 years prior to the event, -1.077 in the year of the event, and -0.323, 1.010, -0.314, -1.563, -0.867, 1.374 and 0.544 in the 7 years following the event over the world growth median (none statistically significant). When correction was made for host nation growth and in comparison with Olympic participating nations only, the excess percentage excess real GDP growth rate was 0.300, 1.740, 1.417, 0.104 in the 4 years prior to hosting the event; 1.881 in the year of the event; and 1.744, 2.534, 0.883, 0.964 in the 4 years following the event (with the second year after the event being the only statistically significant difference).</p>

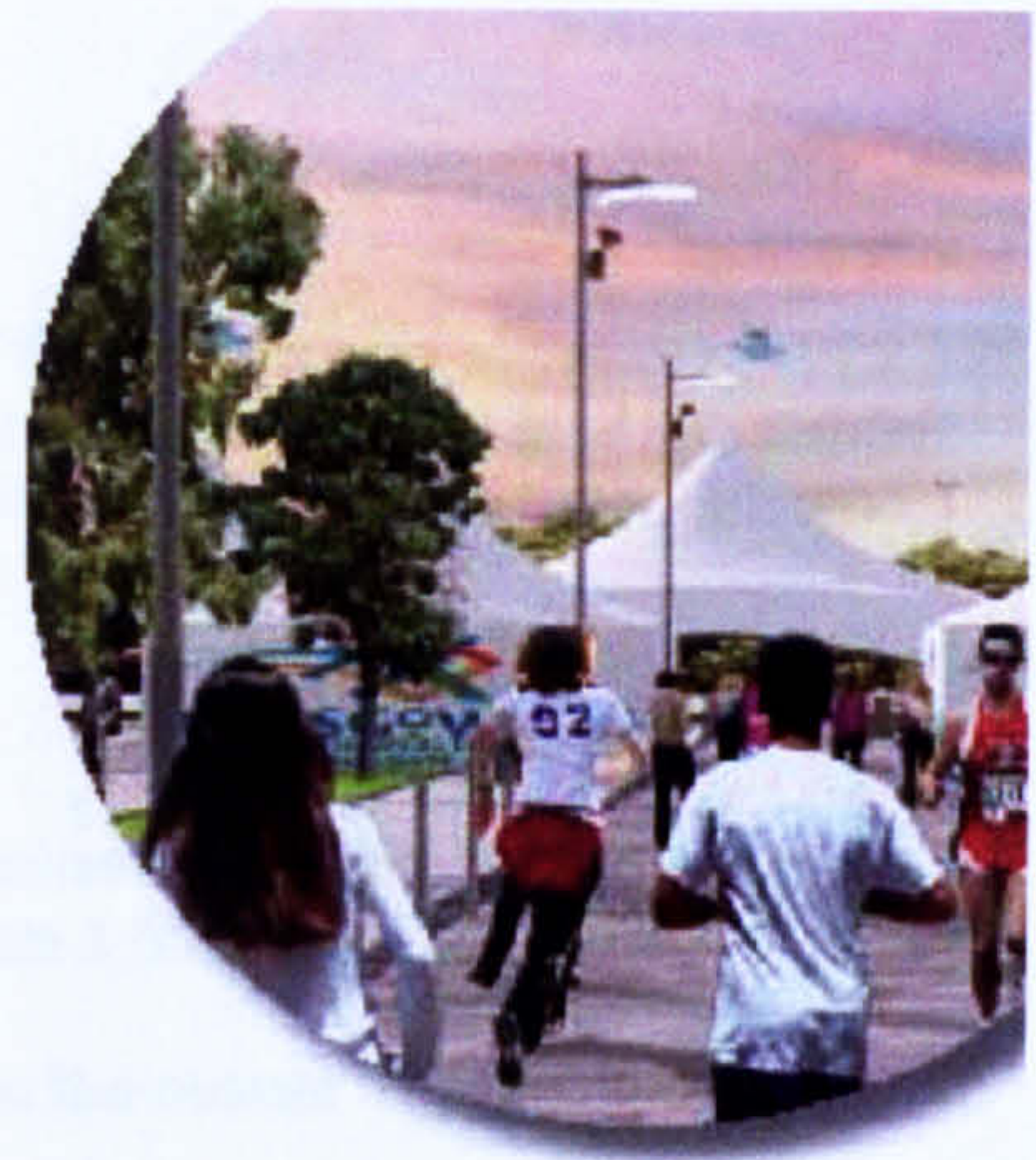
Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Teigland ²⁶⁹	Repeat cross sectional study [NA]	1988 - 1994 Winter Olympics	Level 2- 1 4 5 6 7 [2 3 8]	NA	Western Norway Research Institute	<p>Economy</p> <p>The total number of guest nights in the Olympic region was stable at 105,000/month from 1991 to mid-1995. Within this the Olympic satellite sites increased steadily from 25,000 to 50,000/month and Lillehammer itself increased from 20,000/month to 40,000/month at Games time before falling to 25,000/month by the end of 1994 (all figures approximated from graphs). Changes in demand for rooms in establishments >20 beds were significantly explained by GDP growth and during the post-Olympic period (but only for domestic tourism; no level of significance stated). Competing Norwegian destinations' occupancy was explained by GDP growth (for Buskerud only) and the Olympics (positively for Oslo but negatively for Buskerud), indicating a post-Olympic displacement effect. The tourist accommodation occupancy rate in Calgary increased from 53% to 65% between 1983 and 1994 after dipping from over 70% in 1981 (figures approximate). Regression analysis shows that increased prices had a significantly negative effect and domestic demand a significantly positive effect on occupancy, but the Olympic year, or the period following the Olympics had no significant impact (no level of significance stated). Visits to the Olympic facilities in Lillehammer and Olympic museums in Calgary, Albertville and Lillehammer after the Games dropped by approximately 50% every 2-3 years.</p>

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Truno ¹⁰¹	Repeat cross sectional study [NA]	1992 Olympics (Barcelona)	Level 2- Nil [1 2 4 5 6 7 8]	NA	Not stated	Recreation The proportion of the population which does some form of physical or sporting activity at least once a week has increased from 36% in 1983, to 47% in 1989 to 51% in 1995. The proportion of women participating in sporting activity has increased from 35% in 1989 to 45% in 1995.
Tucker ¹¹³	Repeat cross sectional study [NA]	1984 - 2004 Olympic Games	Level 2- 5 6 7 8 [1 4]	NA	Not stated	Economy There was a significant increase in employment across the pooled time series from 6 years before until 1 year after, with a smaller non-significant positive impact for the 8 years after the event. It is also stated that higher Olympic expenditures are negatively correlated with the size of the effect and that the employment impact is larger in wealthier countries.

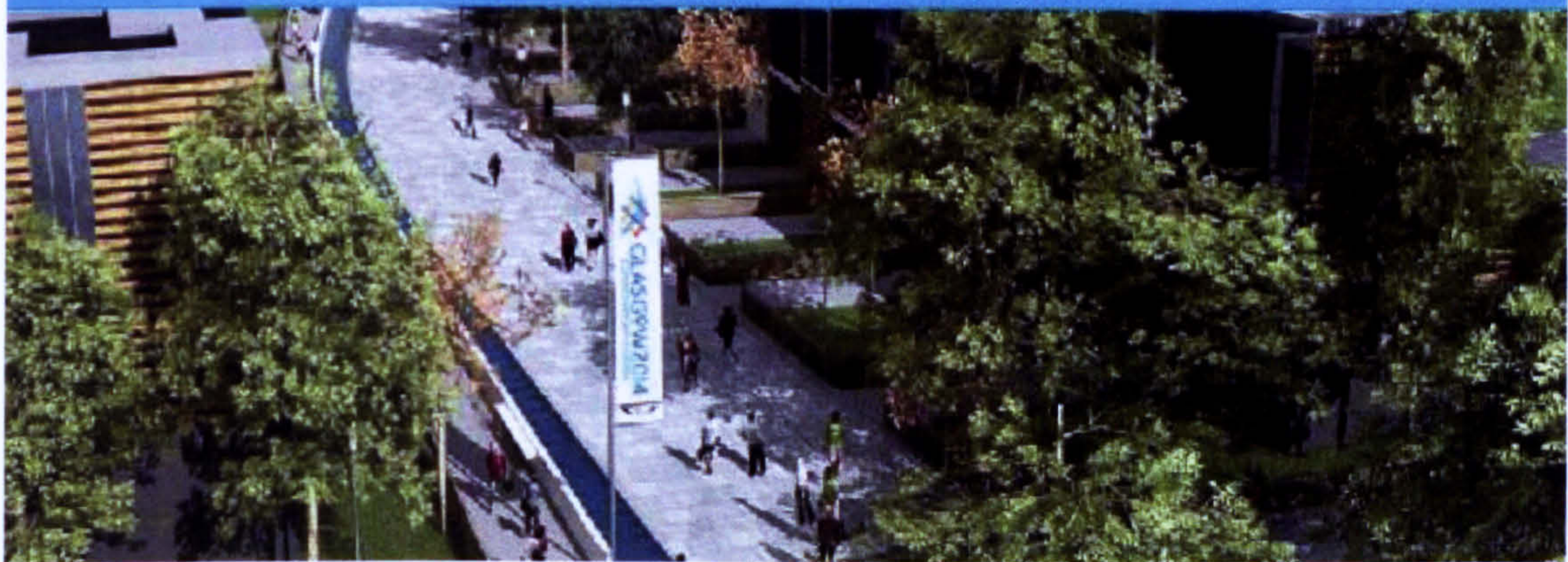
Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Veraros ¹²⁰	Repeat cross sectional study [NA]	2004 Olympics (Athens)	Level 2- 1 4 6 8 [2 3 5 7]	NA	Greek Ministry of National Economy and Finance and National Bank of Greece.	Economy There was an increase in the total Athens stock market value of 7.68% (p=0.035) in the week following the announcement (the announcement was made on a Friday evening after the market was closed), with statistically significant increases in the construction sector (12.85%; p=0.0300) and industrial sector (8.97%; p=0.0146) with no significant change in the banking, insurance, closed-end funds or 'parallel' sectors. There was no significant change in the overall stock market in Milan and significant change in only two of the Milanese stock sectors (construction and electrical) which both increased (4.6%; p=0.032 and 5.4%; p=0.031 respectively).

Author	Study type [& sample size]	Event	Level of evidence ⁹³ & breakdown of critical appraisal criteria met [and not met]	Intervention & implementation	Funding	Outcomes
Waitt ¹³⁹	Cross sectional study [NA]	2000 Olympics (Sydney)	Level 2-4 [1 2 3 8 9]	NA	No funding received	<p>Culture</p> <p>As a result of the prospect of (in 1998) hosting the Sydney Olympics, residents in the three most deprived (Western) SLAs (statistical local areas) were significantly ($p < 0.001$) more likely to feel a sense of community spirit, a sense of pride in Sydney and a feeling of pride in Australia as compared with the three most wealthy (Northern) Sydney SLAs. The mean feeling of community spirit was 1.39, pride in Sydney 1.33 and pride in Australia 1.36 in the deprived Western deprived SLAs as compared with 1.54, 1.50 and 1.53 in the Northern wealthy SLAs on a scale of 1 (strongly agree) to 2.5 (strongly disagree).</p>

Appendix 8 - 'Have Your Say' questionnaire



2014 Commonwealth Games – Have Your Say!



What do we want to know?

We want to know what you think the impact of the 2014 Commonwealth Games could be. Your views will help us to work for lasting positive effects for the people of Glasgow.

What will happen to the information?

This survey is part of a wider consultation being led by Glasgow City Council. It will contribute to a Health Impact Assessment (HIA), which will advise the people organising the Games about the things that could be done to bring about a health benefit. The results of this consultation will be made available through the Glasgow City Council website and through local community facilities.

If you would like more information or would like this questionnaire in another format (e.g. large print, audio) or in another language, please contact

0141 287 4460

The 2014 Commonwealth Games

In the summer of 2014, Glasgow will play host to over 6,000 of the world's best athletes from 71 countries for 11 days of sporting competitions across 17 different sports. Hundreds of thousands of people will visit the city as spectators and to participate in associated cultural events. Millions will watch on television.

The Commonwealth Games plans include:

- Steps to help create Games related employment and business opportunities for local people and companies - it is expected that this will include 1,000 new jobs
- Building a mix of private and social housing
- Recruitment and training of 15,000 volunteers to help run the events
- Detailed consideration of security arrangements
- Guarantees for fair hotel accommodation prices
- Efficient new transport systems
- Cultural events to accompany the games
- Cultural and education programmes involving young people in Scotland over the next 6 years and making links to Commonwealth countries

The events will take place across the city in existing and new venues as follows:



West

Scotstoun Leisure Centre *UPGRADED* – Squash and Table Tennis
Kelvinhall International Sports Arena – Boxing
Kelvingrove Lawn Bowls Complex *UPGRADED* – Lawn Bowls
SECC National Entertainment Arena *NEW* – Netball and Gymnastics
Clyde Auditorium – Weightlifting
SECC Hall 3 – Judo

South West

Ibrox Stadium – Rugby 7s



South East

Cathkin Braes *NEW* – Mountain Biking
Hampden Park – Athletics and Closing Ceremony



East

Glasgow Green – Marathon and Road Cycling
Glasgow Green Hockey Centre *UPGRADED* – Hockey
Celtic Park – Opening Ceremony
National Indoor Sports Arena (NISA) *NEW* – Badminton
National Indoor Velodrome *NEW* – Track Cycling
Tollcross Park National Swimming Centre *UPGRADED* – **Aquatics**
Dalmarnock *NEW* – Games Village
Strathclyde Country Park - Triathlon



How do I take part?

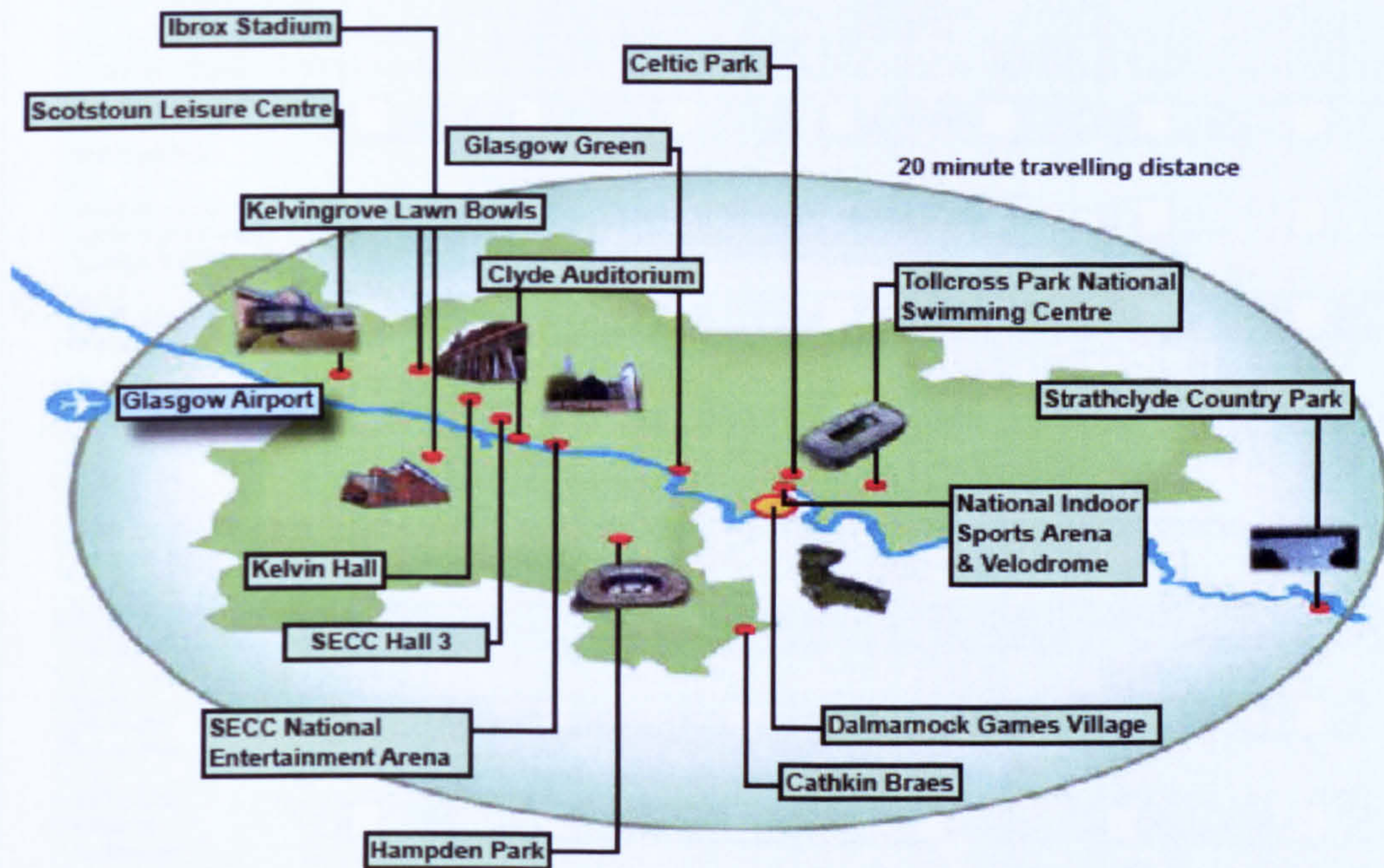
You can complete this survey and return it to the freepost address on the back page or you can answer the same questions on our website at www.glasgow.gov.uk/en/YourCouncil/CG2014/. The consultation period runs until the end of 2008.

Can I get more involved?

Yes! If you have more to say than can be fitted on to this form, you might prefer to take part in an interactive workshop to discuss your ideas. You can find out about what is happening in your local area by contacting the GERA Community Health Initiative on 0141 781 4180 or health@gera.org.uk

To register your interest in volunteering for the 2014 Commonwealth Games in Glasgow go to www.glasgow2014.com/getinvolved/volunteers

Location Map of Venues



Please return this section

But what does all this mean for you?

We want to make sure that there will be long lasting benefits for the people of Glasgow after the 2014 Commonwealth Games has finished. Please answer the following questions to help us shape the city's approach to this challenge.

Return your questionnaire to the freepost address on page 11. You can also complete the questionnaire online at www.glasgow.gov.uk/en/YourCouncil/CG2014/. Closing date for all responses is 31st December 2008.

Q1. Of the developments that are planned as part of the Commonwealth Games, which, if any, of the following, will have the most impact on you?

	Strongly Positive Impact	Positive Impact	Neither Positive nor Negative Impact	Negative Impact	Strongly Negative Impact	No Impact	Don't Know
Housing for the Games Village in Dalmarnock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New and upgraded sporting facilities across the city	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improved transport systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improved outdoor and green spaces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q2. When awarding business contracts to companies for the Commonwealth Games, how important or unimportant are the following?

	Very Important	Fairly Important	Neither nor	Fairly Unimportant	Very Unimportant	Don't Know
Using Fairtrade* businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using local Glasgow businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using businesses that will employ local (Glasgow) people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using non profit making organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using businesses that promote health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using environmentally friendly businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Getting best value for money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Fairtrade is about better prices, decent working conditions and fair contracts for farmers and workers in the developing world

Q6. It is hoped that Glasgow hosting the Commonwealth Games in 2014 will help promote better physical health. How important or unimportant are the following in trying to achieve this?

	Very Important	Fairly Important	Neither nor	Fairly Unimportant	Very Unimportant	Don't Know
Access to affordable healthy food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to affordable sports facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safer routes for walking, cycling and running	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to affordable exercise classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advice on healthier lifestyles (e.g. nutritional advice, stop smoking services, low risk drinking)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using sports people as role models to inspire people to be more physically active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7. It is hoped that hosting the Games will lead to a “feel good factor” within the city. How important or unimportant are the following in trying to achieve this?

	Very Important	Fairly Important	Neither nor	Fairly Unimportant	Very Unimportant	Don't Know
Opportunities for Glaswegians to have a say about planning around the Games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities for Glaswegians to access training, volunteering and jobs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities to take part in a wide range of events and activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using Scottish athletes and their achievements to inspire people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q3. The Commonwealth Games have the potential to increase **tourism** and **provide positive images of the city**. How important or otherwise do you feel it is to promote positive images of the following?

	Very Important	Fairly Important	Neither nor	Fairly Unimportant	Very Unimportant	Don't Know
East End of Glasgow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glasgow City	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scotland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q4. Which if any of the following **learning and education** opportunities would be of **most** interest to you and your family? *(Please tick one only)*

- Commonwealth countries, cultures (e.g. music, art, literature, history etc.)
- Health and Lifestyle
- Sport (e.g. coaching)
- Literacy Skills (e.g. reading and writing)
- None of these
- Don't know
- Other (please specify below)

Q5. It is hoped that the Commonwealth Games will increase **participation in various events and activities** among the people of Glasgow.

Please state how strongly you agree or disagree with the following statements:

	Strongly Agree	Agree	Neither nor	Disagree	Strongly disagree	Don't Know
Glaswegians should get access to tickets for sports and/or cultural events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More work should be done to include people who find it harder to join in events and activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glaswegians should be involved in designing programmes of events linked to the Games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Big events where lots of people volunteer or take part on the same day are a good idea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q8. How concerned or otherwise are you with the following environmental issues as a result of the Commonwealth Games?

	Very Concerned	Fairly Concerned	Neither nor	Fairly Unconcerned	Very Unconcerned	Don't Know
Construction noise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parking difficulties	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Litter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carbon Footprint*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Carbon Footprint measures the impact of activities on the environment (e.g. greenhouse gases produced through burning fossil fuels for electricity, heating and transportation)

Q9. Which, if any, of the following, are most likely to motivate you to become a Commonwealth Games volunteer? (Please tick up to three)

- Opportunity to be part of a big event
- Opportunity for personal development (e.g. to gain experience, skills, training)
- Opportunity to meet new people
- Opportunity to promote Glasgow/share knowledge of the city
- Reimbursement of expenses (e.g. travel, childcare)
- Recognition (e.g. uniform, celebration for volunteers)
- None of these
- Don't know
- Other (please specify below)

If other, please specify:

Q10. What do you think the biggest impact of the 2014 Commonwealth Games will be on you personally?

Q11. Will this impact be positive or negative?

- Positive
- Negative
- Don't Know

Q12. What one action should the organisers take to make sure there is a lasting benefit for the people of Glasgow?

Q13. About you

It helps us to know a bit about the people who have responded to this consultation. We want to make sure that people from a variety of backgrounds have had a chance to have their say. This information is anonymous and voluntary.

(i) Sex

- Male
- Female
- Prefer not to say

(ii) Age (years)

- Under 16
- 16-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75 and over
- Prefer not to say

(iii) How would you describe your cultural or ethnic background?

White

- Scottish
- Irish
- Other British
- Any other white background

Mixed

- Any mixed background

Asian, Asian Scottish or Asian British

- Indian
- Bangladeshi
- Pakistani
- Chinese
- Any other Asian background

Black, black Scottish or black British

- Caribbean
- African
- Any other black background
- Any other background (please specify)

- Prefer not to say

(iv) Do you consider yourself to be a disabled person?

- Yes
- No
- Prefer not to say

(v) Postcode

Q14. Where did you pick up this questionnaire?

- Library
- Sports/ Leisure centre
- Museum
- Housing office
- Community centre
- If other, please state:

What next?

Thank you for completing the questionnaire. Please now return your completed questionnaire to the Freepost address below.

Freepost NAT 2359
Glasgow City Council
Corporate Policy Section
Chief Executive Department
City Chambers
George Square
Glasgow G2 1DU



2014 Commonwealth Games – Have Your Say!



Appendix 9 - Results of Glasgow Household

Survey questions on the Games

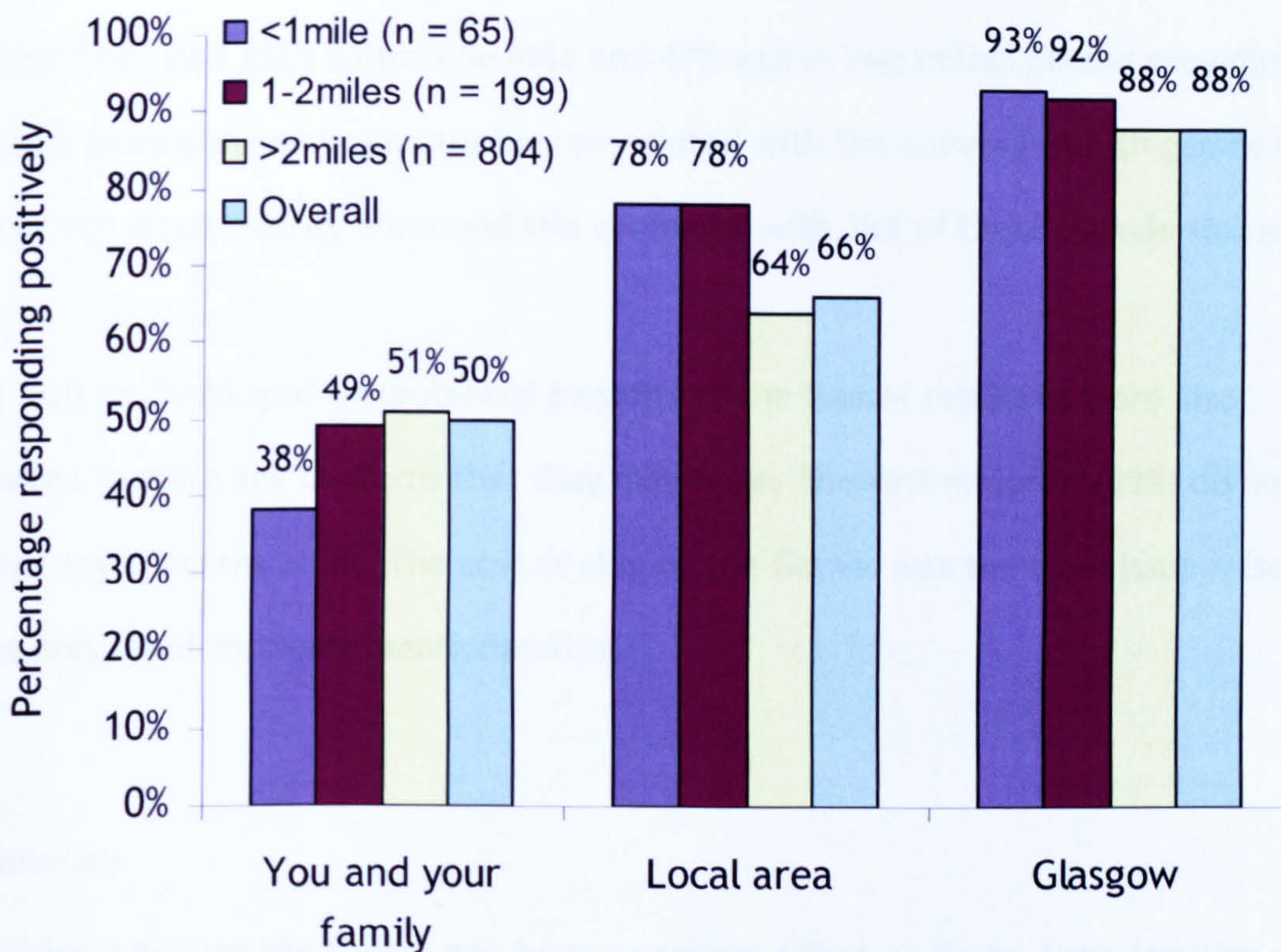
The following is an edited extract from the report of the Glasgow Household Survey covering the questions on the Commonwealth Games:¹⁵³

Overall, half of those interviewed (50%) thought hosting the Commonwealth Games would have a positive effect on themselves and their families. Only 5% thought it would have a negative effect. Older residents (aged 75+) were more likely to believe it will have no effect at all (30%). Over two thirds (67%) thought that it would have a positive effect on their local area. Again, those aged 75+ were not as positive with 18% not believing there would be any effect on their local area. The response was even stronger when residents considered the effect in Glasgow overall. The vast majority (88%) thought it would have a positive effect.

Residents living within one mile of the planned Commonwealth Games Village were less likely to believe it would have a positive effect on themselves and their family. Nevertheless, in line with Glasgow as a whole, very few thought there would be a negative impact. When their local area was considered, a higher proportion of those within one and two miles believed there would be a positive impact on their area. A total of 78% of those within one and two miles believe there would be a positive impact in their area and this compares to just 64% of residents who live outside of this radius. With regard to the impact on Glasgow, there is a widespread belief that the Games will have a positive impact upon the City but this belief is

still slightly stronger in the area within 2 miles of the planned Commonwealth Games Village (Figure 37).

Figure 37 - Perceptions on who will be positively affected by the Games



Residents looked at 14 possible priorities for Glasgow to get as much benefit as possible for hosting the Games, and were asked to rank their top three. The most popular answer was an improvement in the image of Glasgow. The next most popular answer was employment. Those aged 55-59 (29%) were more likely to want to see providing access to employment opportunities as the top priority area, compared with 17% of 16-34 year olds. The third most popular answer was to increase the 'pride / feel good factor' amongst Glaswegians.

The main priority areas of Glasgow's residents were also the main priority areas for those closest to the planned Commonwealth Games Village. Improving the image of

Glasgow was clearly the main priority area. Just under one third (30%) of residents within a two mile radius stated this as the top priority area, and 76% within one mile and 61% within two miles ranked this in their top three priority areas. This compares with 38% of residents outside of the two mile radius.

Around one half (52% within one mile and 47% within two miles) placed providing access to employment opportunities associated with the commonwealth games in their top three priority areas and this compares with 38% of those outside this area.

As well as thinking of the potential benefits of the Games residents were also invited to state any concerns that they may have. The vast majority (89%) do not have any concerns at all. The cost of staging the Games was the main issue raised but only 5% of residents mentioned this.

Summary

Residents believe the Games will have a positive affect on them, their families, their local area, and Glasgow. Perhaps surprisingly, those living closest to the planned Commonwealth Games Village are less likely to believe there will be a positive impact on themselves and their families. For Glasgow to benefit as much as possible from the Games the priorities, according to residents, should be to improve the image of Glasgow and provide access to employment opportunities.

Appendix 10 - Results of the 'Have Your Say' questionnaire

The 'Have Your Say' questionnaire was analysed by members of the Glasgow City Corporate Policy team. The results shown below are adapted from their report of the questionnaire.

Infrastructure - facilities

Seventy-five percent felt that the new/upgraded sports facilities would have a strongly positive (32%) or positive (43%) impact on them. Those aged under 35 were most likely to believe the impact would be strongly positive or positive.

Respondents who had ticked at least one of the motivations for volunteering were much more likely to be strongly positive or positive (83%) compared to those who did not tick any of the motivations for volunteering (54%).

Ninety-five percent thought that access to affordable sports facilities was very important (70%) or fairly important (25%) for improving health. Women (74%) were more likely than men (66%) to say it was very important. The age groups most likely to say it was very important were those aged 25-44 (78% for those aged 25-34, 75% for those aged 35-44 as compared to about 65% for the other age groups). White respondents (73% for white Scottish and 70% for white other) were more likely to say it was very important than Black and minority ethnic respondents (57%). Those motivated to volunteer were more likely to say it was very or fairly important (98%) than those who did not tick a motivation for volunteering (88%).

Eighty-nine percent thought that access to affordable exercise classes was very important (56%) or fairly important (33%) for improving health. Women (64%) were much more likely than men (47%) to say it was very important, as were those aged 25-34 (65% for 25-34, 58% for 35-44, 56% for those <25, 53% for those aged 45-54 and 44% for those over 55). White Scottish respondents (58%) were most likely to say it was very important (49% for white other and BME). Those motivated to volunteer were more likely to say it was very or fairly important (93%) than those who did not tick a motivation for volunteering (77%).

When asked an open ended question about what one action should be taken by organisers to ensure a lasting benefit for the people of Glasgow, the most population answer (25%) was to ensure equitable access for local communities to the new sports facilities.

Infrastructure - transport

Eighty-six percent said that the impact of improved transport systems on them would be strongly positive (48%) or positive (38%). Women (51%) were slightly more likely than men (47%) to say it would be strongly positive. Those under the age of 35 were most likely to say it would be strongly positive (57% for those aged <25, 55% for those aged 25-34, 48% for those aged 35-44, 46% for those aged 45-54 and 42% for those aged 55 and over). Respondents who had ticked at least one of the motivations for volunteering were much more likely to be strongly positive or positive (93%) compared to those who did not tick any of the motivations for volunteering (70%).

Ninety-four percent thought that safer routes for walking, cycling and running were very important (74%) or fairly important (20%) for improving health. Women (79%)

were more likely than men (67%) to say they were very important. Those aged 25-44 were most likely to say that they were very important (80% for those aged 25-34, 77% for those aged 35-44 compared to about 69% for the rest). Those motivated to volunteer were more likely to say they were very important (77%) than those who did not tick any of the motivations for volunteering (62%).

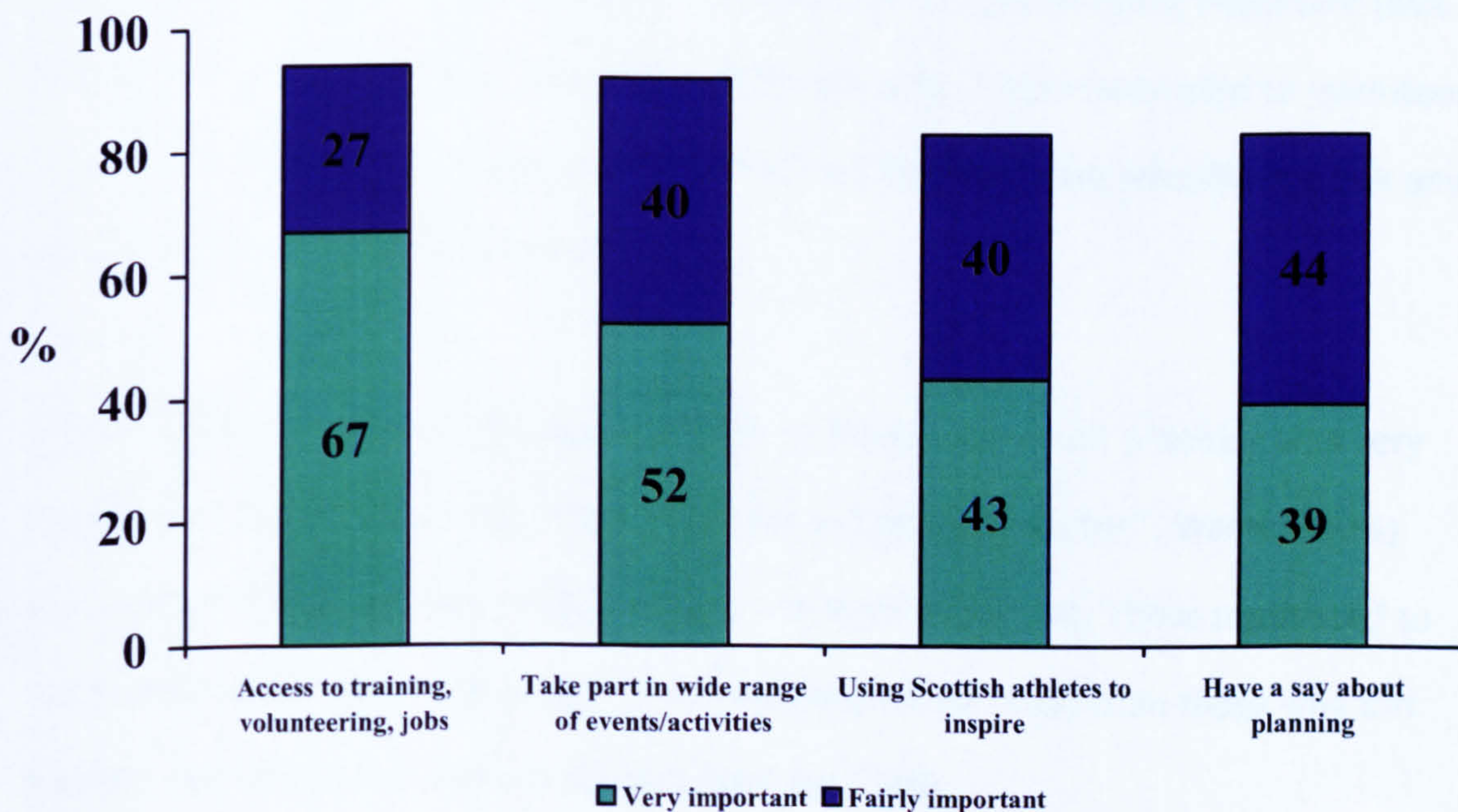
Seventy-five percent said that they were very concerned (39%) or fairly concerned (36%) about increased traffic as a result of the Commonwealth Games. Women (43%) were more likely than men (35%) to say they were very concerned. People who said they had a disability (54%) were more likely to be very concerned than those without (38%). Those living outwith the City but in the Glasgow conurbation were least likely to be very concerned (41% in East End, 40% elsewhere in Glasgow, 34% outwith city but in the Glasgow conurbation, 40% elsewhere in Scotland). Those motivated to volunteer were less likely to say they were very concerned (38%) than those who did not tick any of the motivations for volunteering (44%).

Sixty-six percent said that they were very concerned (36%) or fairly concerned (30%) about parking difficulties as a result of the Commonwealth Games. Women (82%) were more likely than men (60%) to say they were very concerned or fairly concerned. Those aged 25-44 were less likely to say were very concerned (41% for <25, 33% for 25-34, 30% for 35-44, 40% for 45-54, 40% for 55 and over). Black and minority ethnic (BME) respondents were most likely to say they were very concerned (35% for white Scottish, 31% for white other, 46% for BME). People who said they had a disability (50%) were more likely to be very concerned than those without (35%). Those motivated to volunteer were slightly less likely to say they were very concerned (35%) than those who did not tick any of the motivations for volunteering (39%).

A 'Feel Good Factor'

Ninety-four percent of respondents thought opportunities to access training, volunteering or jobs was very important (67%) or fairly important (27%) for a “feel good factor”. Women (74%) were more likely than men (60%) to say it was very important. White respondents were more likely to say it was very important (69% for white Scottish and white other; 44% for BME). Those living in the East End of Glasgow were mostly likely to say it was very important (72% compared to 67% for other areas). Those motivated to volunteer were more likely to say it was very important (72%) than those who did not tick any of the motivations for volunteering (50%) (Figure 38).

Figure 38 - The importance of different aspects of the Games in generating a 'feel good factor'



Ninety-two percent thought opportunities to take part in a wide range of events and activities was very important (52%) or fairly important (40%) for a “feel good factor”. Women (58%) were more likely than men (46%) to say it was very important. Those aged 25-34 were most likely to say it was very important (59% for those aged 25-34, 56% for those <25, 54% for those 35-44, 46% for those aged 45-54, and 49% for those over 55). Those motivated to volunteer were more likely to say it was very important (57%) than those who did not tick any of the motivations for volunteering (34%).

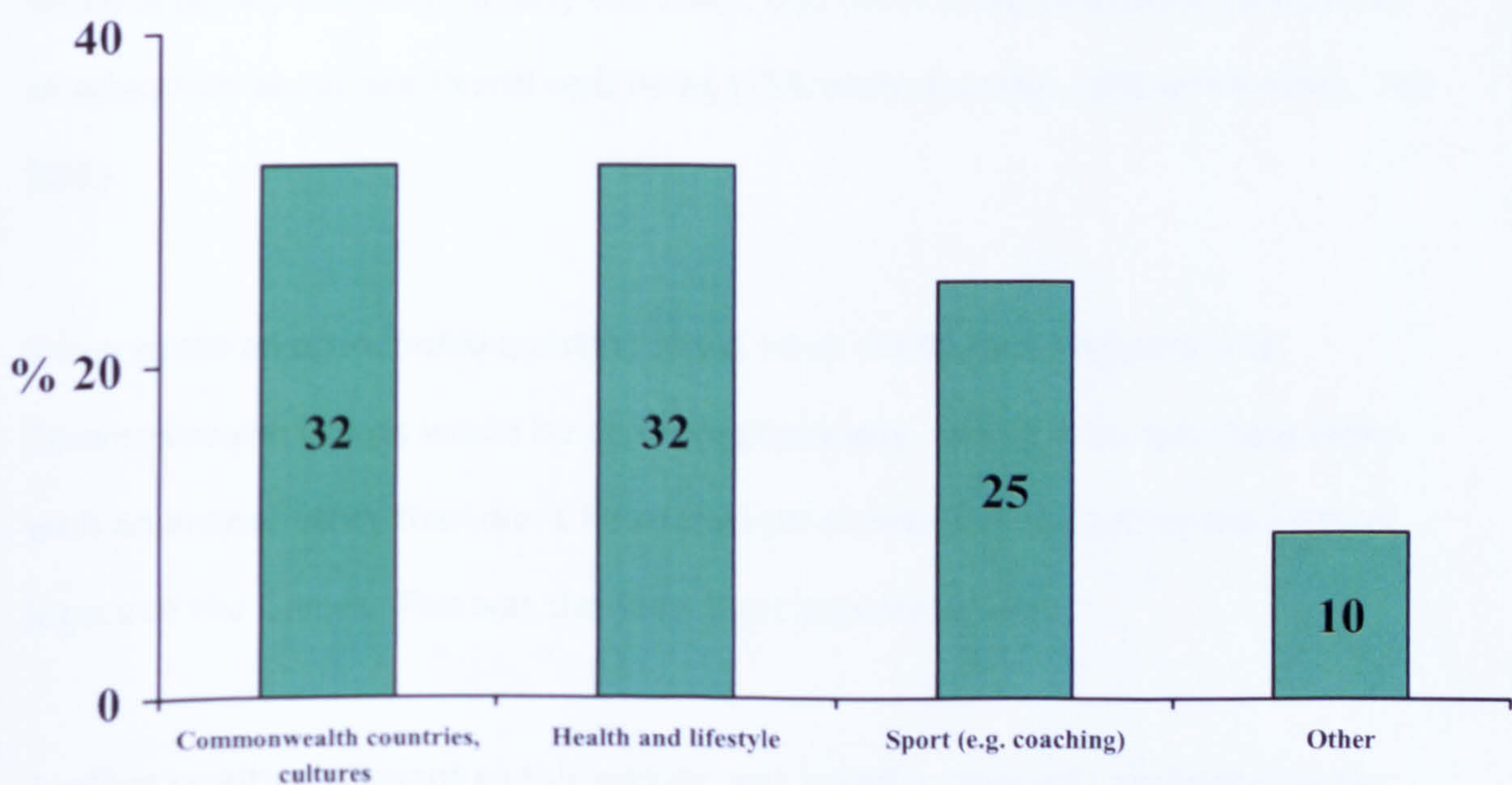
Eighty-three percent thought using Scottish athletes and their achievements to inspire people was very important (43%) or fairly important (40%) for a “feel good factor”. Women (47%) were more likely than men (40%) to say it was very important. Those aged <25 and those over 55 were most likely to say it was very important (54% for those aged <25, 39% for those aged 25-34, 44% for those aged 35-44, 39% for those aged 45-54, 52% for those over 55). White Scottish respondents were more likely to say it was very important or fairly important (86% for white Scottish, 76% for white other, 72% for BME). Those motivated to volunteer were more likely to say it was very important (47%) than those who did not tick any of the motivations for volunteering (28%).

Eighty-three percent thought opportunities to have a say about planning was very important (39%) or fairly important (44%) for a “feel good factor”. Women (43%) were more likely than men (34%) to say it was very important. Those motivated to volunteer were more likely to say it was very important (40%) than those who did not tick any of the motivations for volunteering (34%).

Ninety-two percent thought opportunities to take part in a wide range of events and activities was very important (52%) or fairly important (40%) for a “feel good factor”. Women (58%) were more likely than men (46%) to say it was very important. Those aged 25-34 were most likely to say it was very important (59% for those aged 25-34, 56% for those <25, 54% for those 35-44, 46% for those aged 45-54, and 49% for those over 55). Those motivated to volunteer were more likely to say it was very important (57%) than those who did not tick any of the motivations for volunteering (34%).

Respondents were asked about learning and education opportunities that would be of most interest to them and their family. People were asked to tick only one response. Figure 39 shows the relative importance of each in terms of the proportion of respondents ticking each.

Figure 39 - Learning and education opportunities of most interest



The most popular responses to learning and education opportunities were either about Commonwealth countries and cultures (e.g. music, art, literature, history, etc.) (32%) or health and lifestyle (32%). Twenty five percent said that learning and education opportunities about sport (e.g. coaching) were important to them and their families. About 10% gave other responses to opportunities for learning and education.

Women were more likely to say they were interested in Commonwealth countries than men (35% to 29% respectively) and that they were more interested in health and lifestyle (35% to 29% respectively). Men (31%) were more likely than women (21%) to say they were interested in learning about sport, e.g. coaching. While there was relatively little difference between age groups about learning relative to Commonwealth countries, older age groups were more likely to say they were interested in education about health and lifestyle and younger age groups were more likely to say they were interested in sport. White Scottish respondents were least likely to display an interest in education about Commonwealth countries (30% white Scottish, 38% white other, 40% BME), and more likely to express an interest in education about health and well being (35% white Scottish, 27% white other, 24% BME).

When asked an open ended question about what the biggest impact of the Commonwealth Games would be on them personally, 18% of those who responded with an answer other than don't know thought it would be related to the cultural legacy of the Games. This was the joint most popular answer.

Another question relevant to this section was asked in relation to maximising the "feel good factor" of the Games in regards to the importance of opportunities to

access training, volunteering and jobs. Ninety four percent of respondents thought opportunities to access training, volunteering or jobs was very important (67%) or fairly important (27%) for a “feel good factor”. Women (74%) were more likely than men (60%) to say it was very important. White respondents were more likely to say it was very important (69% for white Scottish and white other; 44% for BME). Those living in the East End of Glasgow were mostly likely to say it was very important (72% compared to 67% for other areas). Those motivated to volunteer were more likely to say it was very important (72%) than those who did not tick any of the motivations for volunteering (50%).

Ninety-four percent of respondents thought opportunities to access training, volunteering or jobs were very important (67%) or fairly important (27%) for a “feel good factor”. Women (74%) were more likely than men (60%) to say it was very important. White respondents were more likely to say it was very important (69% for white Scottish and white other; 44% for BME). Those living in the East End of Glasgow were mostly likely to say it was very important (72% compared to 67% for other areas). Those motivated to volunteer were more likely to say it was very important (72%) than those who did not tick any of the motivations for volunteering (50%).

Volunteering

One of the motivations for volunteering was the opportunity to promote Glasgow and share knowledge of the city. Forty percent of respondents said that this would be a motivation to volunteer. Those aged over 55 were most likely to have ticked this motivation (38% for those <25, 34% for those 25-44, 48% for those 35-44, 40% for those 45-54, 57% for those 55 and over). Respondents living within East Glasgow were most likely to have said this was a motivation for volunteering (51% East

Glasgow, 44% Other Glasgow, 47% within Glasgow and Clyde Valley, 30% elsewhere in Scotland).

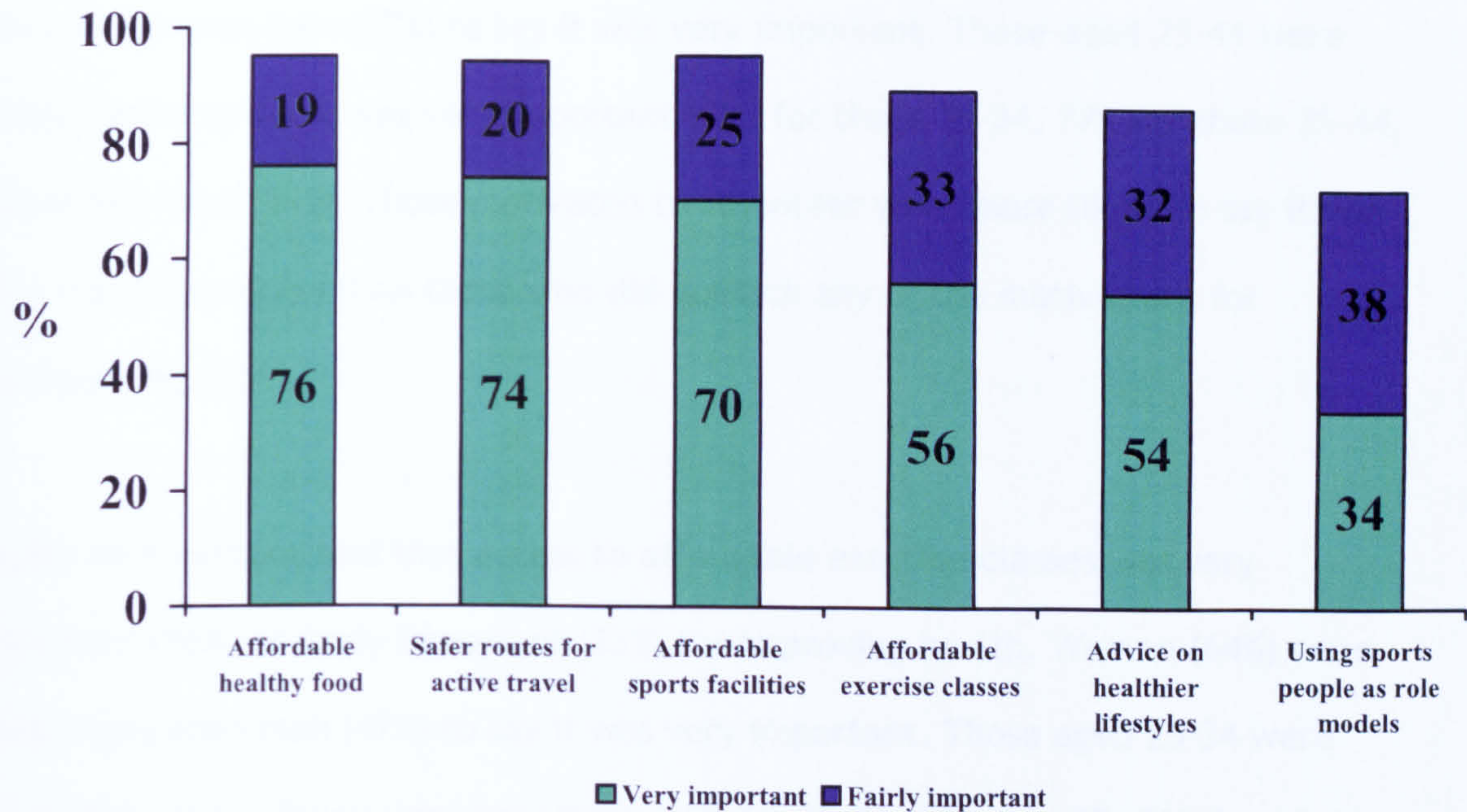
When asked an open ended question about what the biggest impact of the Commonwealth Games would be on them personally, the most population answer (18% - excluding those who said 'don't know') stated it would be related to civic pride.

When asked an open ended question about what one action should be taken by organisers to ensure a lasting benefit for the people of Glasgow, the most popular answer (21% - excluding those who said 'don't know') was related to ensuring adequate community involvement throughout the planning and delivery of the Commonwealth Games.

Health and Well-being

Several questions were asked about how the Commonwealth Games could help to promote better physical health. Figure 40 shows the relative importance of each in terms of positive responses.

Figure 40 - Positive responses to questions about improving health



Ninety-six percent said that access to affordable healthy food was very important (76%) or fairly important (19%) for improving health. Women (82%) were more likely than men (69%) to say it was very important. Those motivated to volunteer were more likely to say it was very important (78%) than those who did not tick any of the motivations for volunteering (70%).

Ninety-five percent said that access to affordable sports facilities was very important (70%) or fairly important for improving health. Women (74%) were more likely than men (66%) to say it was very important. Those aged 25-44 were most likely to say it was very important (78% for those 25-34, 75% for those 35-44, about 65% for others). White respondents (73% for white Scottish, 70% for white other) were more likely than BME respondents (57%) to say it was very important. Those motivated to volunteer were more likely to say it was very important (75%) than those who did not tick any of the motivations for volunteering (54%).

Ninety-four percent said that safer routes for walking, cycling or running were very important (74%) or fairly important (20%) for improving health. Women (79%) were more likely than men (67%) to say it was very important. Those aged 25-44 were mostly likely to say it was very important (80% for those 25-34, 77% for those 35-44, about 69% for others). Those motivated to volunteer were more likely to say it was very important (77%) than those who did not tick any of the motivations for volunteering (62%).

Eighty-nine percent said that access to affordable exercise classes was very important (56%) or fairly important (33%) for improving health. Women (64%) were more likely than men (47%) to say it was very important. Those aged 25-34 were most likely to say it was very important (65% for 25-34, 58% for <25, 58% for 35-44, 53% for 45-54, 44% for over 55). White Scottish respondents were most likely to say it was very important (58% for white Scottish, 49% for white other and BME). Those motivated to volunteer were more likely to say it was very important (60%) than those who did not tick any of the motivations for volunteering (43%).

Eighty-six percent said that advice on healthier lifestyles (e.g. nutritional advice, stop smoking services, low risk drinking) was very important (54%) or fairly important (32%) for improving health. Women (58%) were more likely than men (48%) to say it was very important. Those motivated to volunteer were more likely to say it was very important (58%) than those who did not tick any of the motivations for volunteering (40%).

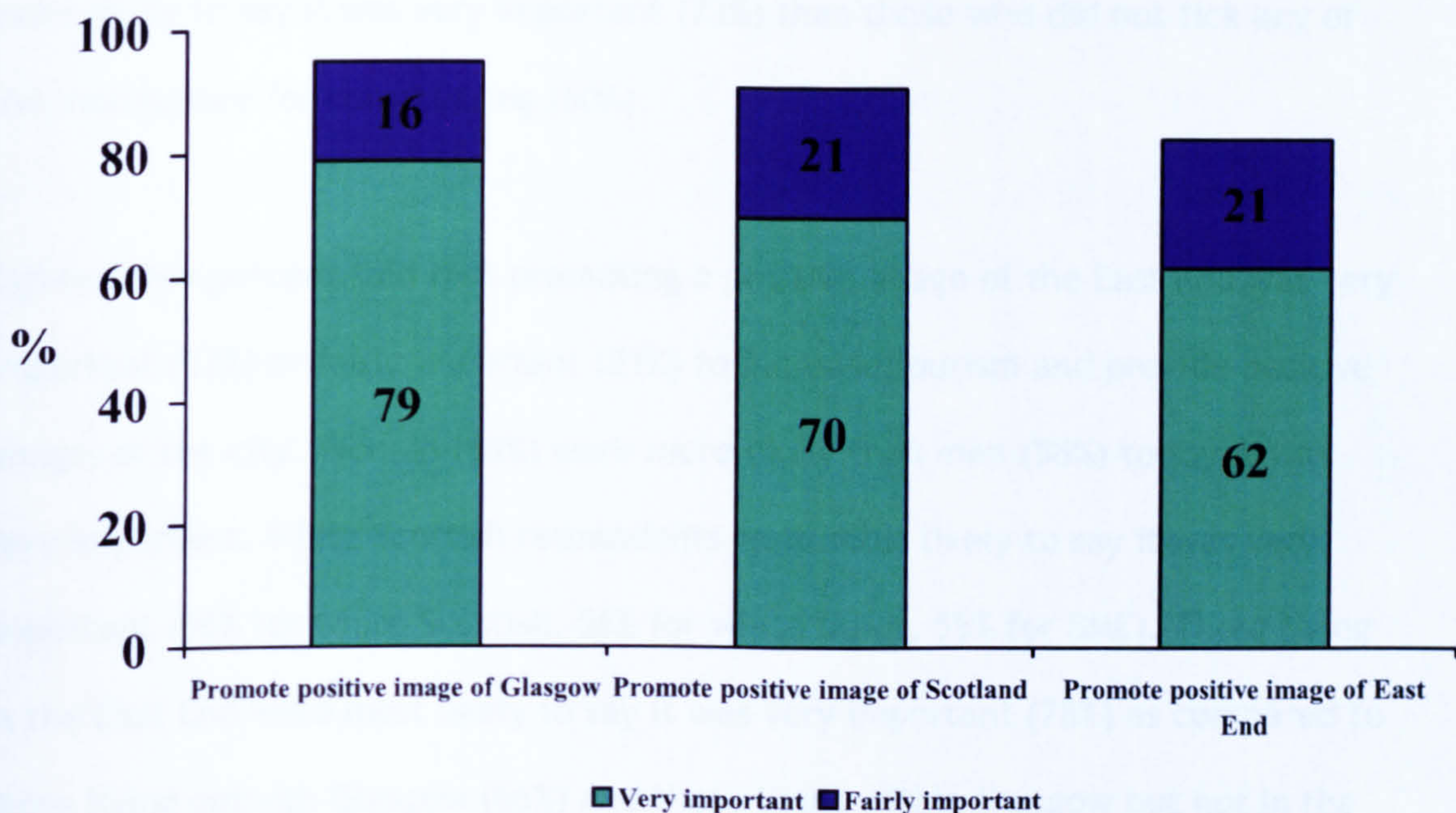
Seventy-three percent said that using sports people as role models to inspire people to be more physically active was very important (34%) or fairly important (38%) for improving health. Those motivated to volunteer were more likely to say it

was very important (38%) than those who did not tick any of the motivations for volunteering (21%).

Image of Glasgow

Questions were asked about importance of promoting positive images of the East End, Glasgow and Scotland to the potential of the Commonwealth Games to increase tourism and provide positive images of the city. Figure 41 shows the relative importance of each in terms of positive responses.

Figure 41 - Positive responses to questions about promoting positive images



Ninety-five percent said that promoting a positive image of Glasgow was very important (79%) or fairly important (16%) to increase tourism and provide positive images of the city. Women (83%) were more likely than men (75%) to say it was very important. White Scottish respondents were most likely to say it was very important (83% for white Scottish, 74% for white other, 68% for BME). Those without a disability (81%) were more likely to say it was very important compared

to those who considered themselves to have a disability (71%). Those motivated to volunteer were more likely to say it was very important (84%) than those who did not tick any of the motivations for volunteering (63%).

Ninety-one percent said that promoting a positive image of Scotland was very important (70%) or fairly important (21%) to increase tourism and provide positive images of the city. Women (77%) were more likely than men (63%) to say it was very important. White Scottish respondents were most likely to say it was very important (74% for white Scottish, 59% for white other, 59% for BME). Those living outwith Glasgow (78%) were most likely to say it was very important as compared to those living within Glasgow (about 66%). Those motivated to volunteer were more likely to say it was very important (73%) than those who did not tick any of the motivations for volunteering (60%).

Eighty-three percent said that promoting a positive image of the East End was very important (62%) or fairly important (21%) to increase tourism and provide positive images of the city. Women (68%) were more likely than men (58%) to say it was very important. White Scottish respondents were most likely to say it was very important (66% for white Scottish, 56% for white other, 55% for BME). Those living in the East End were most likely to say it was very important (78%) as compared to those living outwith Glasgow (66%) and those living within Glasgow but not in the East End (57%). Those motivated to volunteer were more likely to say it was very important (67%) than those who did not tick any of the motivations for volunteering (46%).

In addition to the questions asked about increasing participation, another relevant question to this section was one asked about how to maximise the “feel good

factor” within the City. Ninety-two percent thought opportunities to take part in a wide range of events and activities were very important (52%) or fairly important (40%) for a “feel good factor”. Women (58%) were more likely than men (46%) to say it was very important. Those aged 25-34 were most likely to say it was very important (59% for those aged 25-34, 56% for those <25, 54% for those 35-44, 46% for those aged 45-54, and 49% for those over 55). Those motivated to volunteer were more likely to say it was very important (57%) than those who did not tick any of the motivations for volunteering (34%).

Regeneration

Thirty percent thought that the impact of the Commonwealth Games Village on them would be strongly positive (12%) or positive (19%). Men (34%) were more likely than women (28%) to think it would be strongly positive or positive. BME respondents were more likely to think it would be strongly positive or positive (44% BME, 32% white Scottish, 24% white other). Those living in the East End were most likely to say it would be strongly positive (20% for those in the East End, 10-12% for those elsewhere). Those motivated to volunteer were more likely to say the impact would be strongly positive (13%) than those who did not tick any of the motivations for volunteering (8%).

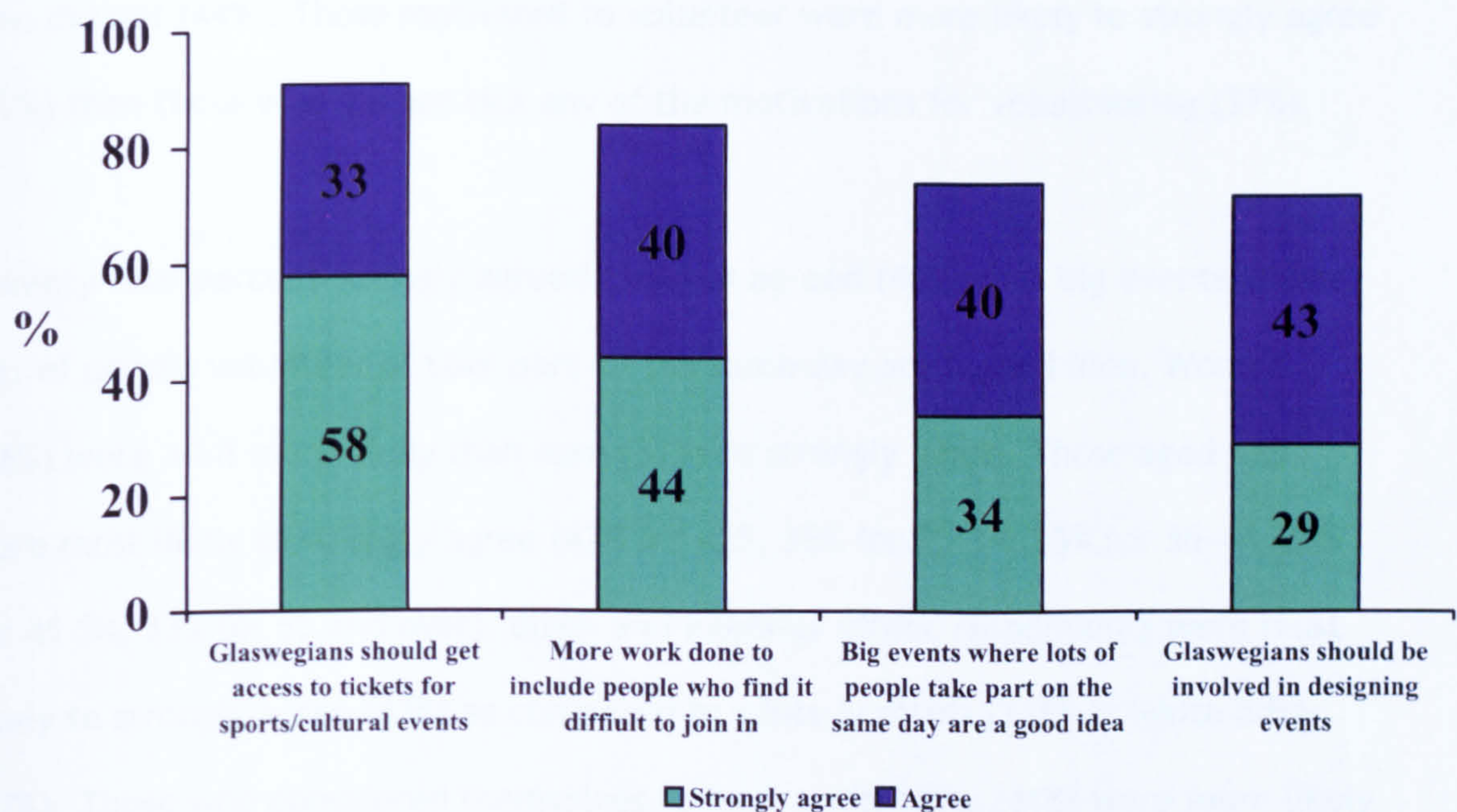
Thirty-five percent were either very concerned (11%) or fairly concerned (24%) about the construction noise that would result from the Commonwealth Games. Women (40%) were more likely than men (28%) to be very or fairly concerned. Those aged < 25 were most likely to be very concerned (18% for <25, 9-11% for others). Those from a minority ethnic background were most likely to be very concerned (19% for BME, about 10% for white). People with a disability (27%) were more likely to be very concerned than those without (9%). Those motivated to

volunteer were less likely to be very concerned (9%) than those who did not tick any of the motivations for volunteering (17%).

Cultural Programmes

Several questions were asked about aspirations for the Commonwealth Games to increase participation in various events and activities. Figure 42 shows the relative importance of each in terms of positive responses.

Figure 42 - Positive responses to questions about increasing participation



Ninety-one percent of respondents strongly agreed (58%) or agreed (33%) that Glaswegians should get access to tickets to sports and/or cultural events. Women (68%) were more likely than men (58%) to strongly agree. Those aged 25-44 were most likely to strongly agree (63% for 35-44, 62% for 25-34 and about 53% for others). White respondents were more likely than BME respondents to strongly agree or agree (92% white Scottish, 89% white other, 82% BME). Those living in

Glasgow or its conurbation were more likely to strongly agree than those in the rest of Scotland (63% in the East End, 58% elsewhere in Glasgow, 59% in the Glasgow and Clyde Valley, 46% elsewhere in Scotland). Those motivated to volunteer were more likely to strongly agree (60%) than those who did not tick any of the motivations for volunteering (48%).

Eighty-four percent strongly agreed (44%) or agreed (40%) that more work should be done to include people who find it harder to join in events and activities. Women (50%) were more likely than men (44%) to strongly agree. Those who considered themselves to have a disability (56%) were more likely to strongly agree than those who did not (44%). Those motivated to volunteer were more likely to strongly agree (47%) than those who did not tick any of the motivations for volunteering (37%).

Seventy-four percent strongly agreed (34%) or agreed (40%) that big events where lots of people volunteer or take part on the same day are a good idea. Women (36%) were a bit more likely than men (31%) to strongly agree. Those aged <25 were most likely to strongly agree (42% for <25, 35% for 25-34, 35% for 35-44, 29% for 45-54, 33% for 55 and over). Black and minority ethnic respondents were most likely to strongly agree (43%) as compared to white Scottish (34%) or white other (27%). Those who considered themselves to have a disability (41%) were more likely to strongly agree than those who did not (34%). Those motivated to volunteer were more likely to strongly agree (38%) than those who did not tick any of the motivations for volunteering (19%).

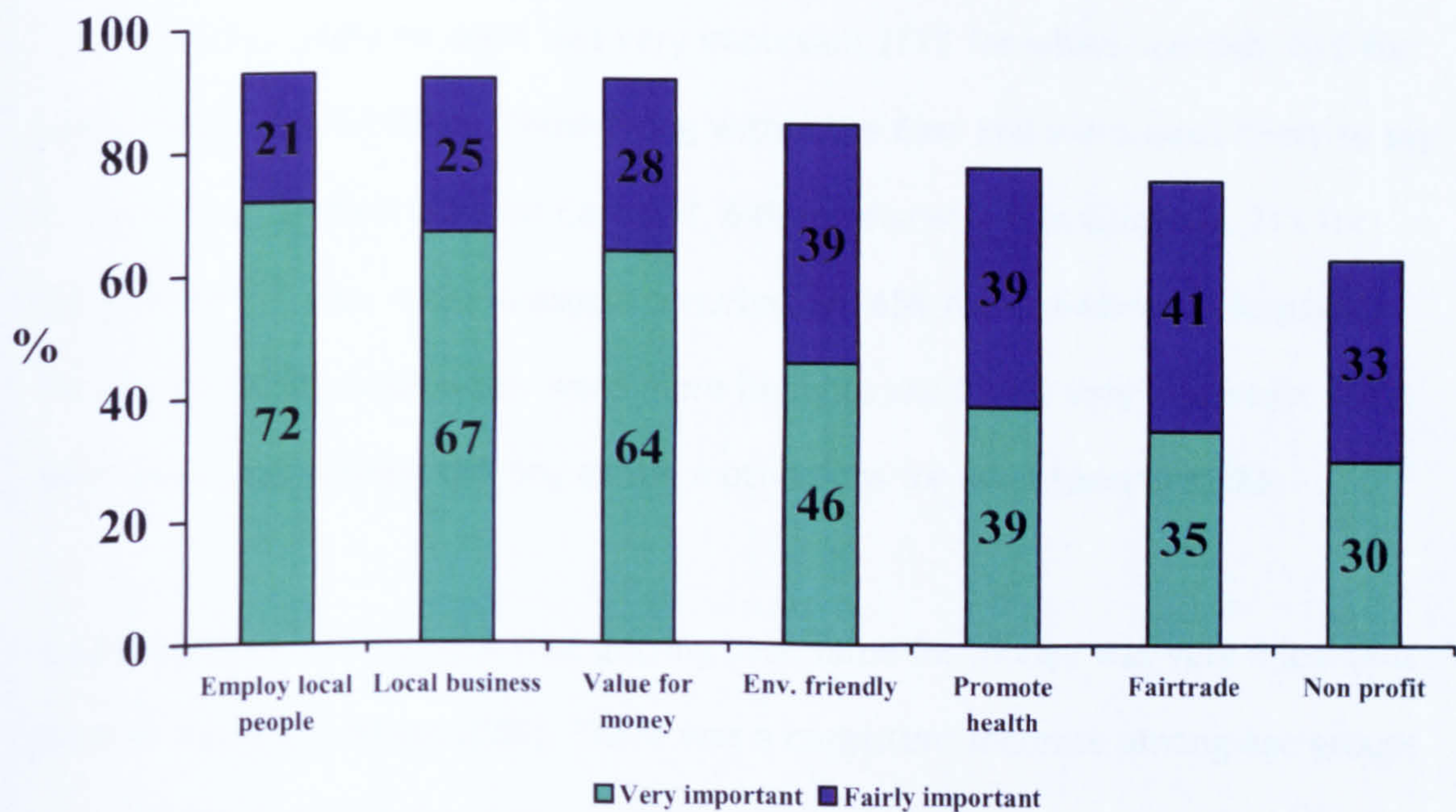
Seventy-two percent strongly agreed (29%) or agreed (43%) that Glaswegians should be involved in designing programmes of events linked to the Games. Women (77%) were more likely than men (67%) to strongly agree or agree. Those motivated to

volunteer were more likely to strongly agree or agree (75%) than those who did not tick any of the motivations for volunteering (62%).

Economy/Employment

Several questions were asked about awarding business contracts for the Commonwealth Games. Figure 43 shows the relative importance of each in terms of positive responses.

Figure 43 - Positive responses to characteristics of businesses for awarding contracts



Ninety-three percent thought that using businesses that will employ local (Glasgow) people was very important (72%) or fairly important (21%). Women (78%) were more likely than men (66%) to say it was very important. Those aged <25 were the least likely to say it was very important (54% compared to over 70% for all others).

White Scottish respondents were the most likely to say it was very important (76% for white Scottish, 66% for white other, 51% for BME). Those living within the East End were most likely to say it was very important (82% for East End, 71% for elsewhere in Glasgow, 73% for outwith the city but in the Glasgow conurbation, 67% for elsewhere in Scotland). Those motivated to volunteer were more likely to say it was very important (74%) than those who did not tick any of the motivations for volunteering (64%).

Ninety-two percent thought that using local Glasgow businesses was very important (67%) or fairly important (25%). Women (78%) were more likely than men (58%) to say it was very important. Those aged <25 were the least likely to say it was very important (56% compared to over 65% for all others). White Scottish respondents were the most likely to say it was very important (71% for white Scottish, 61% for white other, 49% for BME). Those living within the East End were most likely to say it was very important (78% for East End, 64% for elsewhere in Glasgow, 71% for outwith the city but in the Glasgow conurbation, 65% for elsewhere in Scotland). Those motivated to volunteer were more likely to say it was very important (70%) than those who did not tick any of the motivations for volunteering (58%).

Ninety-two percent thought that getting best value for money was very important (64%) or fairly important (28%). There was a consistent increase among age groups in the likelihood of saying it was very important the older the age cohort (52% for <25, 57% for 25-34, 64% for 35-44, 68% for 45-54, 76% for 55 and over). White respondents with a background other than Scottish were least likely to say it was very important (66% for white Scottish, 48% for white other, 61% for BME). Those who considered themselves to have a disability (75%) were more likely to say it was very important than those who did not consider themselves disabled (63%). Those

living within Glasgow but not in the East End (59%) were least likely to say it was very important than those living elsewhere (over 68% for all others). Those motivated to volunteer were more likely to say it was very important or fairly important (93%) than those who did not tick any of the motivations for volunteering (87%).

Eighty-five percent thought that using environmentally friendly businesses was very important (46%) or fairly important (39%). Women (53%) were more likely than men (38%) to say it was very important. White Scottish respondents were the least likely to say it was very important (44% for white Scottish, 57% for white other, 54% for BME). Those who considered themselves to have a disability (55%) were more likely to say it was very important than those who did not consider themselves disabled (46%). Those motivated to volunteer were more likely to say it was very important or fairly important (89%) than those who did not tick any of the motivations for volunteering (74%).

Seventy-eight percent thought that using businesses that promote health was very important (39%) or fairly important (39%). Women (53%) were more likely than men (38%) to say it was very important. Those who considered themselves to have a disability (57%) were more likely to say it was very important than those who did not consider themselves disabled (38%). Those motivated to volunteer were more likely to say it was very important (42%) than those who did not tick any of the motivations for volunteering (29%).

Seventy-six percent thought that using fairtrade businesses was very important (35%) or fairly important (41%). Women (39%) were more likely than men (30%) to say it was very important. White respondents with a background other than

Scottish were the most likely to say it was very important (33% for white Scottish, 44% for white other, 36% for BME). Those who considered themselves to have a disability (43%) were more likely to say it was very important than those who did not consider themselves disabled (34%). Those motivated to volunteer were more likely to say it was very important or fairly important (79%) than those who did not tick any of the motivations for volunteering (67%).

Sixty-three percent thought that using non profit making organisations was very important (30%) or fairly important (33%). Those who considered themselves to have a disability (43%) were more likely to say it was very important than those who did not consider themselves disabled (30%). Those living in the East End were most likely to say it was very important (41% for East End, 33% for elsewhere in Glasgow, 21% for outwith the city but in the Glasgow conurbation, 26% for elsewhere in Scotland).

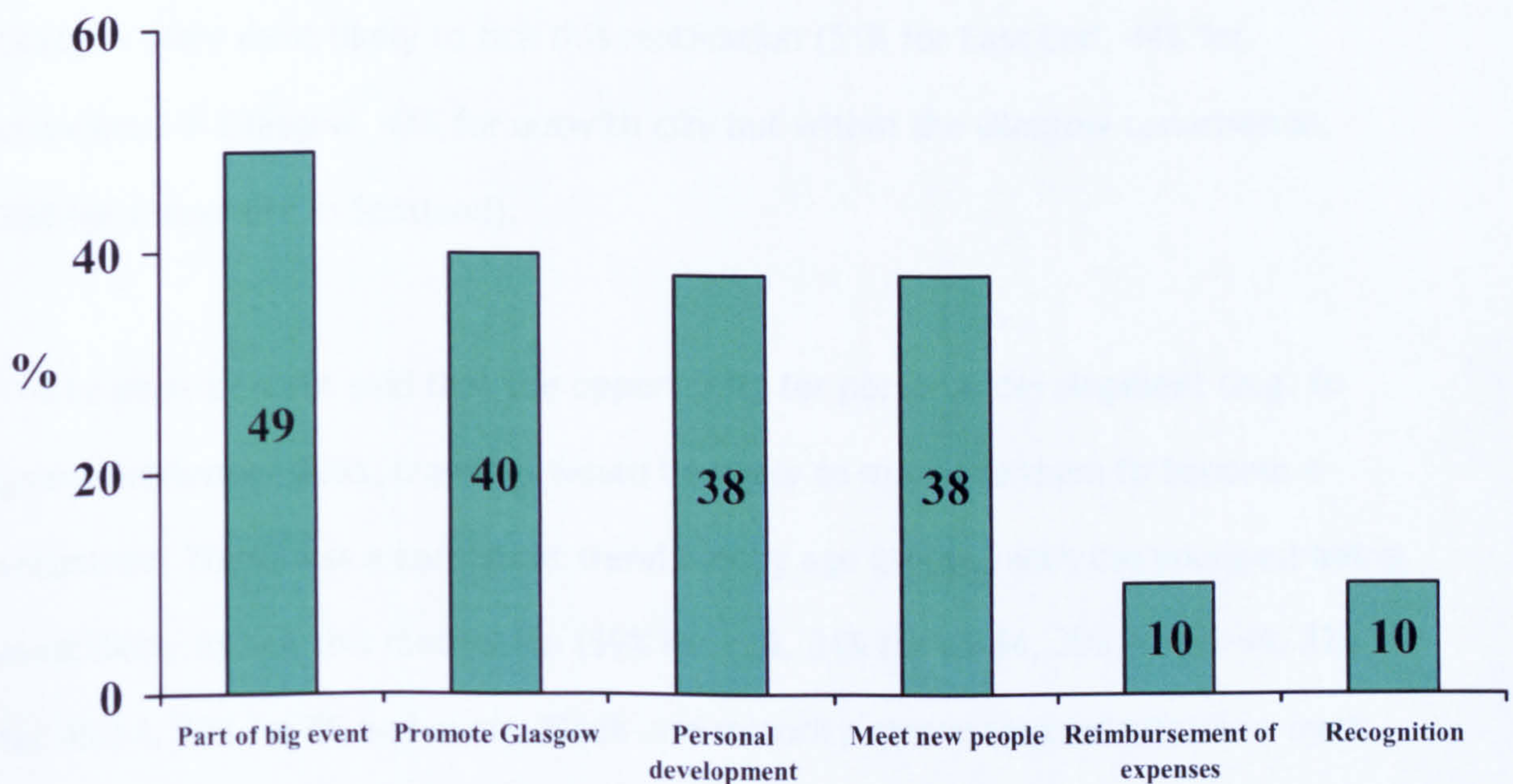
When asked an open ended question about what the biggest impact of the Commonwealth Games would be on them personally, 8% of those who responded with an answer other than don't know thought it would be related to the legacy around employment. Nine percent said it would have to do with the economic legacy, but many of these thought the economic legacy would be negative. There was concern over the costs of the Games being passed on to residents (e.g. through a rise in Council taxes) and there was also concern about funds being diverted from other projects and services.

Volunteering

People were asked to tick a series of items about what would be most likely to motivate them to become a Commonwealth Games volunteer. Respondents were

allowed to tick up to three responses. Seventy-five percent ticked at least one of the motivations for volunteering. Women (83%) were more likely than men (75%) to tick at least one of the motivations for volunteering. Those aged under 45 were more likely to have ticked at least one motivation for volunteering (89% for <25, 83% for 25-34, 83% for 35-44, 71% for 45-54, 74% for those 55 and over). Those who considered themselves to have a disability (70%) were less likely to have ticked one of the motivations for volunteering than those who did not consider themselves disabled (80%). Figure 44 shows the percentage of ticks for each motivation.

Figure 44 - Proportion of respondents motivated by various factors



Forty-nine percent said that the opportunity to be part of a big event would be likely to motivate them to become a volunteer. Women (55%) were more likely than men (47%) to tick this motivation. Those aged under 45 were more likely to tick this (54% for <25, 54% for 25-34, 58% for 35-44, 46% for 45-54, 43% for 55 and over). White Scottish respondents were most likely to tick this motivation (55% for

white Scottish, 46% for white other, 42% for BME). Those who considered themselves to have a disability (38%) were less likely to have ticked this motivation than those who did not consider themselves disabled (53%). Those living outwith Glasgow were most likely to tick this motivation (51% for East End, 49% for elsewhere in Glasgow, 59% for outwith the city and in the Glasgow conurbation, 60% for elsewhere in Scotland).

Forty percent said that the opportunity to promote Glasgow and share knowledge of the city would be likely to motivate them to become a volunteer. Those aged over 55 were the most likely to tick this motivation (38% for <25, 34% for 25-34, 48% for 35-44, 40% for 45-54, 57% for over 55). Those living in the East End of Glasgow were most likely to tick this motivation (51% for East End, 44% for elsewhere in Glasgow, 47% for outwith city but within the Glasgow conurbation, 30% for elsewhere in Scotland).

Thirty-eight percent said that the opportunity for personal development (e.g. to gain experience, skills, training) would be likely to motivate them to become a volunteer. There was a consistent trend among age groups, with the youngest being most likely to tick this motivation (59% for <25, 54% for 25-34, 39% for 35-44, 32% for 45-54, 20% for 55 and over). Black and minority ethnic respondents were most likely to tick this motivation (40% for white Scottish and white other, 57% for BME).

Thirty-eight percent said that the opportunity to meet new people would be likely to motivate them to become a volunteer. Women (44%) were more likely than men (36%) to tick this motivation.

Ten percent said that reimbursement of expenses (e.g. travel, childcare) would be likely to motivate them to become a volunteer. Those aged under 45 were slightly more likely to tick this motivation (12% for <25, 12% for 25-34, 13% for 35-44, 6% for 45-54, 8% for 55 and over).

Ten percent said that recognition (e.g. uniform, celebration for volunteers) would be likely to motivate them to become a volunteer. Those aged under 35 were more likely to tick this motivation (18% for <25, 17% for 25-34, 10% for 35-44, 6% for 45-54, 8% for 55 and over).

An additional 3% ticked the other category as a motivation for volunteering. When asked to specify what would motivate them, the most common response was to elicit a “feel good factor” (e.g. pride in representing the city or feeling valued). The next most common specifications were to improve their chances of access to 2014 sporting/cultural events, financial incentives and benefits, and a passion or interest in sports.

Sports development

There were two of questions asked in relation to other sections of the questionnaire that are relevant to sports development.

Seventy-three percent said that using sports people as role models to inspire people to be more physically active was very important (34%) or fairly important (38%) for improving health. Those motivated to volunteer were more likely to say it was very important (38%) than those who did not tick any of the motivations for volunteering (21%).

Eighty-three percent thought using Scottish athletes and their achievements to inspire people was very important (43%) or fairly important (40%) for a “feel good factor”. Women (47%) were more likely than men (40%) to say it was very important. Those aged <25 and those over 55 were most likely to say it was very important (54% for those aged <25, 39% for those aged 25-34, 44% for those aged 35-44, 39% for those aged 45-54, 52% for those over 55). White Scottish respondents were more likely to say it was very important or fairly important (86% for white Scottish, 76% for white other, 72% for BME). Those motivated to volunteer were more likely to say it was very important (47%) than those who did not tick any of the motivations for volunteering (28%).

Environment

Eighty-three percent said that the impact of improved outdoors and greenspace as part of the developments of the Commonwealth Games on them would be strongly positive (44%) or positive (39%). Women (48%) were slightly more likely than men (41%) to say that it would be strongly positive. Interestingly, those living outwith the City but within the conurbation were slightly more likely to say it would have a strongly positive or positive impact (83% for East End, 84% for elsewhere in Glasgow, 90% for those outwith the city but in Glasgow conurbation, 74% elsewhere in Scotland). Those motivated to volunteer were more likely to say it would be strongly positive (49%) than those who did not tick any of the motivations for volunteering (28%).

Eighty-two percent said they were very concerned (47%) or fairly concerned (35%) about litter as a result of the Commonwealth Games. Women (86%) were more likely than men (76%) to be very concerned or fairly concerned. Those aged over 55

were significantly more likely to be very concerned (44% for <25, 38% for 25-34, 43% for 35-44, 49% for 45-54, 64% for 55 and over).

Sixty-three percent said they were very concerned (27%) or fairly concerned (36%) about air pollution as a result of the Commonwealth Games. Women (30%) were more likely than men (23%) to be very concerned. Those aged <25 were most likely to be very concerned (39% for <25, 23% for 25-34, 24% for 35-44, 27% for 45-54, 28% for 55 and over). BME respondents were most likely to say they were very concerned (23% for white Scottish, 32% for white other, 48% for BME). Those who considered themselves to have a disability (44%) were more likely to say they were very concerned than those who did not consider themselves disabled (25%). Those motivated to volunteer were slightly less likely to say they were very concerned or fairly concerned (63%) than those who did not tick any of the motivations for volunteering (69%).

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