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TITLE PAGE: Using mixed methods to analyse barriers to primary paediatric health access

Abstract

This paper describes the way in which a mixed methods approach might provide a knowledge base to understand some of the factors involved in access to paediatric healthcare. The paper addresses the potential for this approach to start to build an evidence-informed understanding of a public policy issue.

Our research tracked the increase in paediatric presentations at the Woman's and Children's Health Service Emergency Department (ED) in South Australia for primary care illness events. The use of ED for primary care services is an increasing issue for emergency service provision.

The mixed methods used the Hospital Admission Status (HAS), Paediatric Emergency Department data, analysis of the South Australian Social Health Atlas for demographic and epidemiological data, and triage priority information. This quantitative analysis informed the use of interviews with parents, community health providers and emergency health professionals. Sequencing allowed the researchers to integrate the question over time and revealed policy deficits in health access in Australia.

Keywords

Mixed methods, narrative inquiry, multiple regression, triangulation, emergency department use.

Main body

Introduction

The use of mixed methods research methods is recommended when investigating complex health sciences and health policy issues related to healthcare access (Kelly & Bonnefoy 2007; Leech, Onwuegbuzie & Combs 2011). The combination of the use of demographic, epidemiological and narrative data can provide an understanding of the complexity of health access issues (Kelly & Bonnefoy 2007). Epidemiological and demographic data can, on occasion, identify information on class, gender, education,

income, and other Social Determinants of Health (SDH) as well as providing the basis for understanding the interactions between these categories and patterns of health (Kelly & Bonnefoy 2007). Furthermore, investigating the commonalities and differences between qualitative and quantitative data can provide a pragmatic framework for research design (Johnson & Onwuegbuzie 2004).

Whilst quantitative data can describe factors including the number of attendances and is important in managing some aspects of a service (Kelly & Bonnefoy 2007; Pope, Mays & Popay 2007), it cannot explore the deeper needs of a population group or explain the influences behind some SDH, or why people make the decisions that they do. In short, demographic and epidemiological data provides information that explains a situation telling us what is occurring, but lacks the capacity to tell us why or what influences health access, and hence what might be an appropriate solution. This is often best addressed through in-depth interviews, focus groups or other qualitative approaches.

This paper outlines a mixed method approach used to understand the increasing trend for parents seeking emergency care for their sick child. The Woman's and Children's Health Service (WCH) ED, is South Australia's main tertiary hospital for sick children. The use of WCH for primary care services such as that provided by general practitioners (GPs) might be more appropriate is potentially less efficient than the use of ED for emergency care (McWilliams, Tapp, Baker & Dulin 2011). The study occurred between 2009-2011 in South Australia and took as a major hypothesis that health access is a social determinant of health, and that lack of access could be linked to social disadvantage. The paper provides a brief overview of the mixed methods used to explore this question with a particular focus on the concept of sequencing as an investigative strategy. This is followed by a discussion of the research design with a statement of the findings at each stage. In the final section we discuss how these processes enabled us to arrive at a particular interpretation of events, only possible through the sequencing of data gathering. In the study outlined in this paper both quantitative and qualitative data were used to understand why families chose an Emergency Department (ED) for non-urgent care in preference to a primary care provider.

Mixed methods as a research approach

The strength of mixed methods is that it has the potential to reduce bias linked to a single methodological design. Mixed methods also afford the ability to triangulate data through a more comprehensive collection process (Johnson & Onwuegbuzie 2004; Johnson, Onwuegbuzie & Turner 2007; Pluye, Gagnon, Griffiths & Johnson-Lafleur 2009; Sosulski & Lawrence 2008) by using two or more data sets to confirm, refute, or question the findings of each other. In addition, mixed methods designs are a powerful process capable of illuminating policy deficits and solutions by providing directions for social action that arise from qualitative comments (Sosulski & Lawrence 2008; Whitehead & Popay 2010).

Social actions require the use of inductive and deductive reasoning processes in order to understand complex interactions and the appropriate applications of mixed methods (Creswell & Plano Clark 2007; Brenner, Hughes & Sutphen 2008) therefore determining construct validity is important. The concepts of construct mixed methods validity are determined by asking the following questions; i) What empirical evidence is available that links the data in meaningful ways? ii) What evidence is used to justify the relevance of the data linkages? iii) What are the consequences and appropriateness of the data interpretation? and, iv) What are the societal consequences either intentional or unintentional of the interpretations? (Dellinger & Leech 2007). These questions inform the process and analysis of the data collection and the sequencing used in this study.

Here the empirical evidence is the knowledge that is available – perhaps via raw data, coding criteria, theoretical rationales, member checks, and statistical analysis that link data to the meaning of the data (Dellinger & Leech 2007; Teddlie & Tashakkori 2009). Further, does the evidence that is available justify its utility, its relevance and value to a research community? Additionally, are the consequences of data interpretation appropriate given the potential consequences of these inferences, the values of the researcher inherent in the choices made, and the impacts these meanings have on the data. Furthermore, the consequences of the appropriate use of the data in terms of intended and unintended social implications or value implications can only be determined by society and the research community in the future (Braveman, Cubbin, Egerter, Chideya, Marchi,

Metzler & Posner 2005; Dellinger & Leech 2007). All these aspects have important implications for the validity of mixed method designs (Dellinger & Leech 2007; Teddlie & Tashakkori 2009).

According to Dellinger and Leech (2007, p. 312) mixed methods validity is based on firstly the foundational elements; this new concept reflects the previously unaddressed aspect of the ‘researcher’s’ prior understanding of a construct and/or phenomenon under study’ and includes personal reflections, comprehensive theoretical and empirical understandings and analytical developments, understandings, evaluations, and is the combination of all these influences. Secondly, the inferential consistency uses the consistency of previous understandings with the appropriateness of the design, measurement, comprehensiveness and conclusions of the research together. Thirdly, the historical element is the validity construct in which the impact of past information provides acceptable constructs that measure the evidence appropriately and in a meaningful way for the research community. Fourthly, the consequential element in construct validity for mixed methods consists of the social acceptability of the outcomes of the research as assessed by the stakeholders, subsequent researchers and the broader community. In this study the use of a mixed methods research design addressed the first three concepts by combining the researcher’s previous experience, the literature, previous research, an understanding and definition of the constructs, and a transparent account of the mixed methods research process. The fourth element was provided by the social constructionist analysis, as well as, member checks, discussions with health professionals and the dissemination of the findings.

Sequencing in mixed methods

The sequencing of data collection refers to the order and procedures involved in the data collection process (Creswell & Plano Clark 2007). The data is collected in stages that are related to one another but not independent of each other (Creswell & Plano Clark 2007). Sequencing can either ‘tell the story’ or confirm or triangulate results. For example, sample selection criteria and the timing of data collection can be used to establish the relationship between qualitative and quantitative data and this enhances the links between forms of data, findings, and conclusions (Haverkamp et al 2005; Sosulski & Lawrence

2008).

In this study the initial quantitative data (Hospital Admission Status) analysis indicated an increasing use of ED services for primary care but did not provide an insight into why this had occurred. The various data and sequences were chosen to build a picture of i) how many families were using ED for primary care (HAS data), ii) their geographical location, and what was their socio-economic level, measured through postcode (Social Health Atlas, ABS data). This information allowed for a comparison to be made with the parents interviewed in the qualitative component of the study, and subsequently arranging for a focus group interview with Culturally and Linguistically Diverse (CALD) migrants and low socioeconomic parents at a community health centre, to more accurately ascertain the views of the population represented in the quantitative data. Thematic analysis of interviews pointed to the need to explore community based services. The interviews with service providers highlighted flaws in current Federal and State government reforms that would not meet the needs of the population studied. Interviews with staff enabled a cross checking with parent interview data and provided some understanding of the statistical data. The interviews also provided an understanding of the pathways used by families in accessing ED. The in-depth narrative exploration of families attending in the 'possible primary care' category provided insight into their rationale for attending an ED department for a non-urgent episode of care. The mixed methods approach answered the research questions raised from different perspectives, as well as allowing the accumulation of varying depths of knowledge. Below each step is outlined in detail commencing with a preamble on triage priority scales and the formulation of the question to stages 1 through to 3 that outlines the study design.

Triage priority

In Australia, all presentations at public hospital emergency departments are subjected to a process of prioritization, using the Australasian Triage Scale (Commonwealth Department of Health and Family Services, 1997 reviewed 2006 [CDHFS]). This tool consists of an evaluation of the patients' condition to assess the level of urgency required for treatment (CDHFS 1997). This scale rates clinical urgency in hospital-based EDs across Australia and New Zealand (CDHFS, 1997). It assesses the need for immediate

clinical intervention and determines performance parameters for patient flows in ED. Patients are assessed on arrival by an appropriately trained triage registered nurse who monitors their clinical signs and progress through ED (CDHFS, 1997). Triage identifies patients needing immediate clinical attention and patients that can wait. The patient's condition is assessed using a priority rating of between 1 to 5. Priority 1 determines 'very urgent' clinical interventions, and treatment at level 5 being able to wait 120 minutes or longer (CDHFS, 1997; van Veen, Steyerberg, Ruige, van Meurs, Roukema, van der Lei & Moll, 2008). Priority 4 and 5 indicates a presenting condition that could wait to be seen for 2 hours or more and this often indicates a condition that may be treated by a primary care service such as the local GP (McWilliams, Tapp, Baker & Dulin 2011). This study began in 2009 by reviewing the 2007, and 2008 data. The initial analysis using the HAS data showed that attendances at the WCH for priority 4 and 5 attendances had increased on previous rates and this was supported by the 2009 and 2010 data. These are often primary care presentation.

Table 1 here

A comparison of the attendance numbers by priority level over the three month period highlights the increase in Priority 5 between 2007 and 2008. Table 1 indicates that the rate increased by almost 65% during 2007-2008. However, the attendees were declining in 2008 for all other priority levels compared to the previous year. The Chi square test also showed a significant increase in the priority 5 level, $\chi^2(1, n = 2,317) = 2312.80, p < 0.001$ (Kelley & Maxwell 2010) over the years 2007 and 2008. This differs from the trend in the other priority cases which show a decrease in attendance numbers and a statistically significant differences ($p < 0.001$ Priority 2 and $p < 0.05$ for Priority 3 and 4) in ED attendance over the same time span. The results from this data indicated an increase in possible primary care cases attending ED supporting the need for further investigation (Parry & Willis 2012).

Ethics approval

Ethical approval was received from (supplied after publication) and the Women's and Children's Health Network in South Australia. The original data from HAS ED were provided as a de-identified data set and used to ascertain the need for the study. All subsequent HAS ED data were also supplied in a de-identified form. The ABS and *Social*

Health Atlas data were provided only at a postcode level.

Study Design

Research Process: Stages

The stages of the mixed method design outlined in Figure 1 illustrate the pathway and orderly sequence of events used for the collection and analysis of the data. This succession of events and the choice of methods was determined by the literature, previous research in the area, and the unfolding enquiry.

Insert Figure 1 here

Stage 1

In stage one a review of the literature on the Social Determinants of Health (SDH) was conducted in order to determine the aspects of the SDH that impacted on ED use for primary care. In addition, a literature review on the use of ED for primary care occurred. These two literature reviews were accompanied by collection of non-urgent usage Hospital Admission Status (HAS) attendance data over the previous two years. The international research literature describes the use of ED using three broad themes: the characteristics of frequent ED users; the socioeconomic (SDH) influences on ED use, usually referred to as deprivation; and the availability of alternative services to ED use (Bentley 2005; Boeke, van Randwijck-Jacobze, de Lange-Klerk, Grol, Kramer & van der Horst 2010; Downing & Rudge 2006; Masso et al 2007; Parry & Willis 2012; Moore, Deehan, Seed & Jones 2009; Santos-Eggimann 2002; Siminski, Bezzina, Lago & Eagar 2008a; Siminski, Bezzina, Lago & Eagar 2008b) . The literature review illustrated the links between deprivation (SDH) and ED use for primary care and its increase in OECD countries. In addition, the initial HAS data highlighted the increasing use of ED for possible primary care over a three year period. The use of HAS postcode information provided a linkage to the Australian Bureau of Statistics (ABS) deprivation indicator¹.

¹ The Socio Economic Index for Area has 4 ABS indexes the one chosen for this research was the Index of Relative Socioeconomic Disadvantage (SEIFA IRSD). This has 17 indicators of disadvantage e.g. income, occupation, education level.

The ABS data uses several SDH as indicators for an areas level of deprivation, such as the levels of educational attainment. The SDH were used in the multiple regression analysis in stage 3. This stage also informed the data collection process in stage 2.

Rationale for using Quantitative data

Demographic data

Demographic data was gathered to situate the families interviewed within the broader social setting, for example, the postcode situates the family in a socioeconomic (quintile) group thus enabling the linking of social theories on deprivation and disadvantage with the data. The positioning of the family in a quintile group also provided a means of situating the narrative analysis within a broader context. For instance, if the family's income is in the lowest quintile range, then their transport and health access patterns may be similar to that of other families in the same quintile group and this supports the generalisation of these findings to others in this quintile group.

Epidemiological data

Epidemiology is the logical and systematic collection of data on diseases, its occurrence, and location both locally, nationally and globally (Nsubuga, White, Thacker, Anderson, Blount, Broome, Chiller, Espitia, Imtiaz, Sosin, Stroup, Tauxe, Vijayaraghavan & Trostle 2006). By comparing rates of disease in populations and subpopulations epidemiological studies highlight the impact of the SDH on disease rates. Epidemiology alerts us to the fact that the patterns of disease lie mostly outside of the biomedical model's sphere of influence (Bonita, Beaglehole & Kjellstrom 2006). Epidemiological information can be combined with demographic information to enhance the understanding of the population's capacity to access health services. For example, areas containing higher level of residents dependent on commonwealth benefits may require more health services due to the link between poverty and ill health (Marmot & Wilkinson 2006). This research found areas of deprivation also had increased levels of ill health but lower levels of service provision (ABS 2011; Glover et al. 2006).

Epidemiology data from the Social Health Atlas was used to describe the occurrence of diseases in the geographical locations and population groups who were the highest users

of the ED. The severity of illness and the postcode data collected by the HAS ED alerted us to patterns of health events, and characteristics or determinants of health (ABS SEIFA IRSD information ABS 2011). By comparing this data to the information on health service provision data (also found in the *Social Health Atlas*) it was possible to make a determination on the appropriateness of existing health services in the location.

The HAS ED data provided information on postcodes. This assisted the study in two ways. Firstly, it provided the triangulation of the information collected from other sources to strengthen the results, for example, the SDH information from the ABS. Secondly, it aided in the validation of the information provided by other members of the same community; e.g., corroboration between data from service providers with the *Social Health Atlas*?

Stage 2

Stage two used a concurrent mode of data collection of families recruited for interview who had been discharged from ED and the collection of HAS ED data on the families that used the hospital ED. The families that attended ED and were subsequently discharged potentially represented cases of primary care illness that could use another service, as well as possible candidates for interview.

The qualitative interviews

Eighteen parents were interviewed using a narrative approach. These were mostly mothers. Information was sought on how they accessed health care for their children with an emphasis on differences between family members (a possible gap in the literature), modes of transport used to obtain care (a SDH and a HASS variable), and social support (ABS variables used in the SEIFA IRSD data and indicators used in the *Social Health Atlas* data) available to families. In the interviews the mothers were asked to tell the story of their child's illness and how they made decisions about the use of health care. Questions included when the judgment was made to take the child to ED, and who in the family made this decision and what alternative services were available.

Narrative research and analysis

The use of narrative to determine social constructions

The HAS quantitative data does not explain the SDH prevalence and its influence on ED use for primary care. Narrative inquiry uses the stories that emerge from interviews and examines the material within the context of how the data and participants are situated in the social world. It is the task of the researcher to tell the story of both the lived experience of the participants being interviewed and the way in which they interact with the external world (Kohler Riessman 1993; Liamputtong 2009). Meanings are derived through the deconstruction and reconstruction of the narratives defining structural elements (Duffy 2008; Tynyanov & Jakobson 1928).

The systematic means of understanding the structure and function of complex stories and events used by narrative analysis reveals the social world and an individual's identity (Czarniawska 2004; Duffy 2008). As such, narrative study is situated within a social constructionist paradigm and illuminates the individual's understanding of their socialisation process (Duffy 2008; Young 1990). Further correlation and multiple regression also provided aspects of the social constructive paradigm as here it is used to analyse the impact of some of the SDH on ED use (Davies 2007). The social constructive paradigm can be linked to correlation and multiple regression analysis aspects of quantitative social research within institutional and socio-political context of a society through the inclusion of SDH measures. For example, the use of postcode data situates those using ED within broad social strata. This information is compared with data on the provision of health services in a postcode area. Thus the use of mixed methods may compliment the social constructivist paradigm by exploring the SDH data from the epidemiology and HAS data in conjunction with the parent's stories, CALD² focus group responses, and ED staff and community health primary care service providers understanding of the issue (Woolley 2009).

This supports the use of multiple regressions allowing the research design to predict

² The Culturally and Linguistically Diverse Focus group was included as this postcode area was prominent in the HAS data as an area of large use of ED for primary care.

aspect of future health access and service use. For example, the multiple regression can be used to predict the future impact of the variables (such as SDH or HASS variables) (Siminski et al 2008a; Siminski et al 2008b) on an occurrence factor (for example, ED use) and the narrative interview process allows the participants to explore their options for future health care access. Using these two methods may provide an increased validity to the predictions (Sosulski & Lawrence 2008; Winter 2000). Thus, the results or outcomes of a critical event may influence patterns of future health access.

Qualitative interviews with staff

Ten staff working in ED also volunteered to be interviewed for this study. The details of the WCH staff members included employment level such as, manager or RN level 1, skill levels and duties and interactions with the patients and their families. Furthermore, interviews were conducted with four community based primary care service providers. These interviews provided an in-depth understanding of the staff's perceptions of why families used ED use for primary care. The analysis of these data indicated that in particular postcode areas there was inadequate provision of timely services for children. This limited a family's options for after-hours care.

Qualitative interviews and CALD focus group with parents

Eighteen parents volunteered to provide their lived experiences of ED and primary care use for their children. The parents were recruited using an information letter provided to each family after the use of ED for primary care. In addition, a CALD focus group from an area of high ED use for primary care was also conducted. The interviews and focus group provided in depth and clarity in understanding the use of ED for primary care.

Triangulation and rigour of qualitative data

The interviews described above were conducted in order to provide one form of triangulation and rigour of the data, and to ascertain the staff's, parent's and community primary health service provider's understanding of the influences on health access decisions. The key stakeholders in the (WCH) ED section of the hospital were also interviewed (Fereday & Muir-Cochrane 2006; Koch 2006; Woolley 2009). The WCH staff included the; Divisional Chief, Manager Facilitators, Clinical Nurse Consultants,

Clinical Nurses and ED nurses and some Medical personnel. The use of multiple data sources was done to strengthen the reliability and validity providing rigour to the data sourced from staff and families (Fereday & Muir-Cochrane 2006; Koch 2006; Woolley 2009).

The use of multiple work site staff, both acute and community based, was also seen as important as their views provide information on the ability of the organisation to provide appropriate and timely health care. Those often needing the most services, for example the chronically ill and the poor, have less access (Furler et al. 2002; Siminski et al 2008a; Siminski et al 2008b; Suruda et al. 2005). Bradley (2005) suggests that 50% of patients attending ED have access barriers to alternative forms of health care, although Lega and Mengoni (2008) argue that many patients who access ED erroneously believe that their condition is serious. Bradley (2005) also suggests that non-urgent usage is a contributing factor to ED overcrowding and inefficiency that leads to deleterious health outcomes for ED patients and decreased job satisfaction and burnout in staff. This research supports the findings of Furler et al. (2002), Suruda et al. (2005), and Bradley (2005).

Gaining an insight into the staff perspective also enabled an exploration of the service provider's understanding of the SDH and how these aspects informed decisions about family's health care access. For example, the WCH staff noted that parents from lower SEIFA IRSD areas attended ED more often for primary care. Staff opinions often inform service developments and the face-to-face interactions with the public; for example WCH staff may interpret ED overcrowding as evidence of the need for more staff rather than a need to develop alternative community services. The analysis of all sites staff interviews led to the next stage (3) of the research project and the use of the *Social Health Atlas*³ data and identification of the provision of services in postcode areas that had used ED for

³ The *Social Health Atlas of Australian Local Government Areas, 2010* includes data on a range of population characteristics, including demography, socioeconomic status, health status and risk factors and use of health and welfare services. This Excel workbook provides these data by Local Government Areas (LGA), Statistical Subdivisions (SSD), Statistical Divisions (SD), Metropolitan/ Country areas and States/ Territories.

primary care in the highest rates e.g. the HASS analysis showed the highest number of attendees (787) at the pediatric ED were from postcode area 5108 and this area has the lowest SEIFA IRSD (highest level of deprivation) score of 905 (ABS 2011). This posed questions regarding the level of services that are available in this area?

Insert table 2 here

Table 2 provides a cross reference of the numbers of residents per GPs in each postcode area of highest ED use for primary care, rates of attendance, and SEIFA IRSD scores to obtain ED services. This illustrates the lack of GP services and levels of deprivation in particular postcode areas. Table 2 also illustrates that the state average for GP provision is 1,039 people per GP (Bakare, Moyle, Hattingh & Grimbeek 2012; Glover et al 2006).

Stage 3

In stage three the data were analysed from the sequential and concurrent mixed methods data collection events. The HAS ED demographic data were evaluated against the demographic data from the *South Australian Social Health Atlas* (Glover et al. 2006) in order to determine if the areas of high ED use contained higher percentages of children, professionals/managers, unemployed, GP services, access to private transport and single parent households. Further, the ABS SEIFA IRSD scores provided an understanding of the levels of deprivation in the relevant postcodes (ABS 2011). These factors were examined to build a picture of those postcodes that had the highest rates of ED attendance. The collation of the data used frequencies, chi square (χ^2), logistic regression, and thematic analysis. The logistic regression may provide an understanding of the influences on presentations to ED and an opportunity for the possible diversion to primary care and primary health care for some cases by the supply of alternative services. For example, does the numbers of GPs in an area impact on the use of ED for primary care? This data and analysis provided an understanding of other aspects of the family's life circumstances that may impact on their choice to use the ED for primary health care. The *South Australian Social Health Atlas* (Glover et al. 2006) data indicated that the postcodes representing the highest users of ED for primary care had the lowest levels of GP services, high levels of deprivation and limited access to allied health professionals.

All analyses of HAS ED and SEIFA IRSD data were performed using SPSS software, version 18.0 (PSPP, Evanston, Illinois, USA). Descriptive statistics are expressed as cross tabulation to highlight the areas of highest use of ED while, χ^2 and logistic regression enabled possible conclusions to be drawn from the relationships between the HAS ED and SEIFA IRSD variables arising from the data. This approach can be used to predict future ED usage by particular population groups (Brace, Kemp & Snelgar 2006; Hastings et al. 2008; Suruda 2005). The epidemiological data and the qualitative responses to the questions on ED use were analysed to determine the links between income, occupation group and health access. The findings indicated that on the whole those patients attending from the lowest SEIFA IRSD areas (areas with the highest levels of deprivation) used the ED service for primary care more often. This may be due to a lack of GP provision. According to the epidemiological data these areas did have the lowest levels of primary health access, namely GP service. This was usually less than the State average of 1,006 per GP (ABS 2011). This finding was supported by the results from the interviews with parents, Staff and Community Service Providers.

Triangulation of qualitative and quantitative results

Triangulation involves the convergence of evidence from different sources that not only reflects the research questions but also supports the results from alternative viewpoints (Combs & Onwuegbuzie 2010; Hentz 2008). The use of triangulation in research combines several types of theoretical perspectives, data sources, methodological approaches, data collection processes and data analysis (Azulai & Rankin 2012). In this study the four aspects of triangulation (Figure 2) informed the data collection process and the analysis.

Triangulation of mixed method data also occurs when the research method is congruent with the philosophical paradigm (Azulai & Rankin 2012; Annells 2006; Combs & Onwuegbuzie 2010; Ostland et al 2011). The validation of the information is an ongoing deliberate process that unfolds as the research progresses and each piece of information is checked with another source (Azulai & Rankin 2012; Combs and Onwuegbuzie 2010). Any differences and similarities are compared and verified in order to develop a full picture of the research question (Roberts and Taylor 2006).

Another method used to enhance triangulation was the use of multiple investigators or data checking (Azulai & Rankin 2012). This was achieved via the corroboration of the themes by another investigator. This also enhanced rigour as does the use of multiple methods of triangulation (Hansen 2006). The Table 3 highlights the different methods of triangulation and how they have been used in this study. In addition, due to the complexity involved in studying health science issues the use of mixed methods research assists in the corroboration and triangulation of the data while providing broader and deeper exploration of the research questions (Ostland, Kidd, Wengstrom & Rowa-Dewar 2011).

Insert Table 3 here

Table 3 outlines the key features of this research design. An additional feature of the design was the collection of HAS ED data twice, 12 months apart which provided an aspect of time triangulation (Ostland et al 2011; Roberts & Taylor 2006). This provided the opportunity to determine the consistency of the information over time and is a supplementary form of triangulation proving within-method and between-method triangulation (Azulai & Rankin 2012). The consistency of the information may then be projected into similar lived experiences for others in the future.

Limitations of the study design

There were several limitations to this study design, and to specific data. The limitations of the HAS ED data include no income measurements, no family support information and a limited information identifying influences on families for their health access choices. While the qualitative data was strong, narrative methods entail the collection of stories from the participants. This is a subjective process that relies on memories of an event, not facts. Given that a child's illness is a stressful event for parents the recollections of the circumstance may be inaccurate. However, as noted, in an effort to minimise any distortion key stakeholders were also interviewed for their views on family presentations in the Priority 5 category. This provided an alternative data set to compare with the parent's accounts. The integration of narration via its cultural, psychosocial and linguistic constructs can be termed discourse (Daiute & Lightfoot 2004). Discourse situates

language and actions within a particular cultural and social setting and this setting is used here to situate a family within the structural and intermediary SDH. The narratives are confined to those expressing them and narrative interviewing and transcriptions are intensive and not suitable for large studies.

Conclusion

Mixed methods research was used here to build up knowledge regarding some of the factors involved in accessing health care for children. Whilst the work of Hasting et al. (2008) has provided insight into the aspect of social support on older adult's use of ED it has not addressed a family's/children's usage of EDs. Although Suruda et al. (2005) addresses ED access by children and their families using income as a predictor, they did not investigate SDH or access to transport. Neither study provided an in-depth method of data collection to explore the participants' views on factors that influence these attendances at EDs.

This research addresses these deficits by the use of mixed methods to investigate the influences on ED use and their links to the SDH and it uses epidemiological data and narrative analysis to interpret this discourse. The research design used here, whilst acknowledging the previous limitations on the understanding of the societal influences and the researcher bias, attempts to overcome these constraints through the use of mixed methods in both in a sequential and concurrent manner. The use of mixed methods provides the opportunity to critique health policy as it provides an insight into the lived experience of policy and the structural barriers to service provision and the participants experiences of service delivery. This ensures a deeper understanding of some of the aspects of health access. The use of elaboration, corroboration through multiple data sets and methods has provided an in depth exploration of some of the aspects of this complex issue. The research found that parents presented at ED for paediatric condition that were essentially primary care due to the lack of primary care services in their postcode area. While this finding was triangulated between the quantitative and qualitative data sets, the in-depth interviews allowed a broader investigation of many episodes of child and family health access. This process aids in ensuring the results and conclusions are worthwhile and valid. Future research in this area is needed to inform further theoretical links, service

development and research on health access.

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Table 1 here

Table 1: Percentage change (+ve or -ve) of Paediatric ED attendance by Priority level 2007-2008.

PRIORITY	OCTOBER 2007 – DECEMBER 2007	OCTOBER 2008 – DECEMBER 2008	CHANGE (%)	P-VALUE
1	0.2	0.1	-50.0	.14
2	8.1	5.6	-30.9	<0.001
3	29.9	29	-3.0	.02
4	52.7	50	-5.1	<0.05
5	9.1	15	64.8	<0.001

Figure 1 here

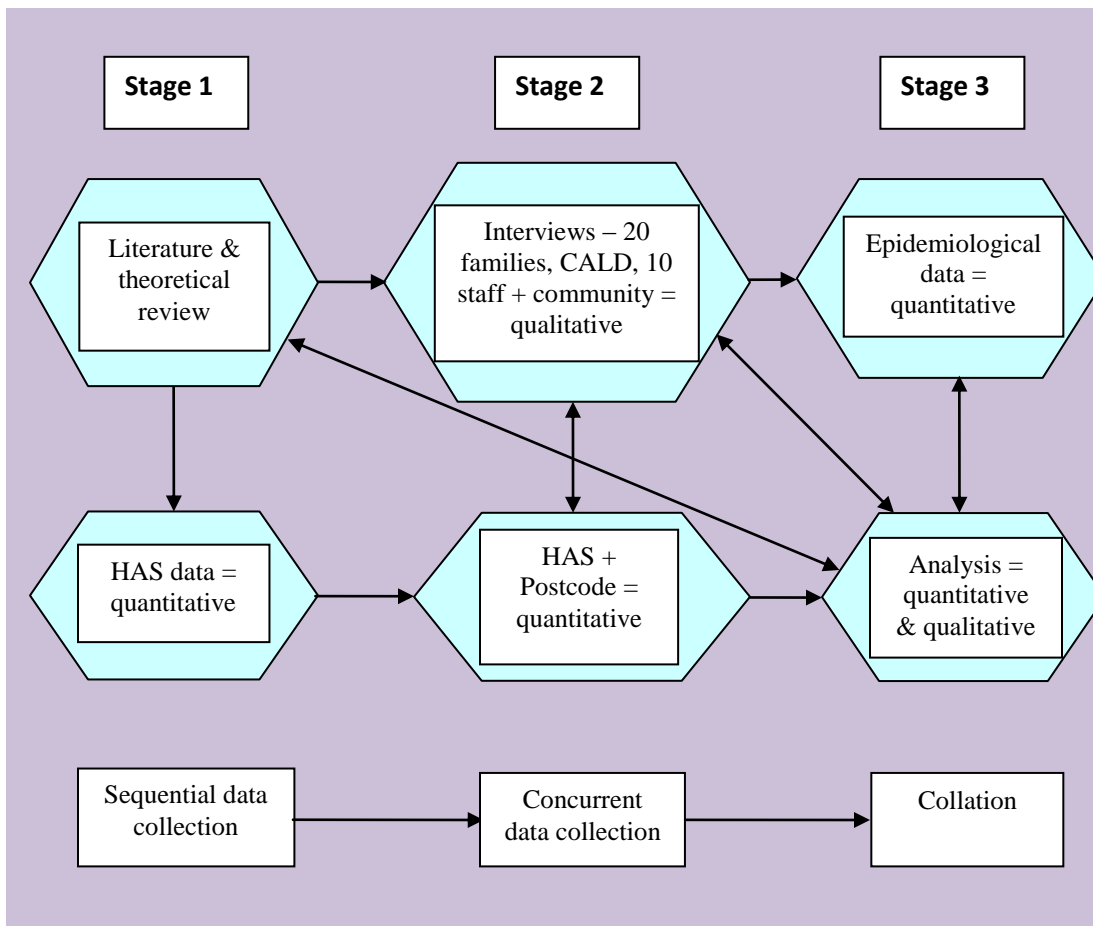


Figure 1 Study design and stages (adapted from Kumar 2005 and Woolley 2009)

Table 2 here

Table 2: The top seven postcode areas using ED by access to GP services per head of population

Postcode area	Population per GP	SEIFA IRSD area score	SEIFA quintile group	Numbers of children attending ED (HAS data)	% of attendance for top 7 postcodes
5108	2,529	905	Lowest	787	18.8%
5095	2,216	1004	Middle	630	15.1%
5008	2,165	914	Lowest	507	12.1%
5023	1,285	913	Lowest	514	12.3%
5085	1,018	937	Lowest	612	14.6%
5086	1,018	943	Low	578	13.8%
5082	636	1092	Highest	538	12.9%
Average	1,039	1000		512.5	

Table 3 here

Table 3 Mixed methods summary

	Quantitative	Qualitative
Overarching goals	To determine the numbers of children using ED services in the Priority 4 and 5 category	To examine the reasons behind the presentations at ED for primary care
Guiding theories	Epidemiological and demographic data provides information on the broader patterns of; disease, social influences and health access. Overarching theories of social status and power determining health access was explored e.g. Marx, Weberian and Young.	Narrative analysis explores information on the processes of decisions regarding health access. Language and its usage are socio-politically situated.
Design	Examine HAS data for; number in Priority 5 category, comparisons with last year's figures, possible illness categories.	In-depth interviews with families in Priority 5 category and with key staff members. Semi-structured questions of the families enable the linking and

	Quantitative	Qualitative
	Compare socioeconomic groups, areas, social support, transport and SDH for predictors of ED usage.	situating of the families within tier broader social context. Semi-structured questions examine staff perceptions of Priority 5 cases and social issues determining health access.
Triangulation	Variables from qualitative data and quantitative data such as, income, transport, and types of health access. Compare results with the general population. Using HAS data for simple associations and multiple logical regressions. Compare families and areas for services. Time provides an aspect of triangulation e.g. stability of information over time	Using different methods to triangulated data e.g. narrative interviews with families and key staff members. Based on; a narrative analysis method, literature review, comparison with quantitative data to assess consistencies of themes within population groups. Linking these data to Young's five faces of oppression and the structural and intermediary determinants.