

Total work and health in later life

A life course study

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I, Omobolaji Akinwale, declare that the contents of this thesis are my own work. Where the work of others has been used, this has been indicated and appropriately referenced.

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Abstract

Background and aim: Work is a fundamental activity in all societies. While employment is an essential means of economic growth and improved living standards, it is now widely accepted that appropriate employment also helps to create good health and is among the most important social determinants of health that contribute to health inequalities. Less is known, however about the health effects of other work activity alongside paid employment. The interplay between different forms of work – domestic, informal and paid – taken together is the ‘total work’ that could be remunerated for an individual. Total work varies between individuals, social groups and societies; it also evolves over time for individuals over their life courses. This study aims to enrich understanding of why work is important for health by considering life course experiences of total work positions.

Data and methods: Data from two large-scale longitudinal studies are used to chart experiences of different forms of work from mid life to State Pension age, and their relationships with longevity, psychiatric morbidity and general health in later life. The association of labour market position and informal work at different points in adult lives are examined, and gender and socio-economic differences in these relationships considered.

Findings and implications: Several normative patterns of labour market position are revealed demonstrating a consistent negative association between life course experiences where individuals would have less control over their total work. People who have relatively stable histories in paid employment have better health in later life and lower mortality risk. These histories are more common among people from more advantaged socio-economic groups and the findings are relevant for policies that aim to reduce health inequalities or increase labour market participation.

1. Introduction

The world of work is changing rapidly. In the post-war period social, technological and economic changes have transformed everyday experiences of paid employment and the informal or domestic work that is often unrecognised such as care for relatives. The interplay between different forms of work – paid, domestic, and informal – taken together is the total work that has the potential for remuneration. Total work varies between individuals, social groups and societies. It also evolves over time for individuals over their life courses and for societies at large in different historical periods. As work and health are closely connected, rapid changes in the nature of everyday work are likely to have implications for the health of a nation. These social changes have provoked interest in the health effects of worklessness, and ongoing debates about the social and health effects of poor work life balance, particularly among employed mothers. This study aims to provide new insights on the concept of work and examine the implications of different forms of work among adults in the UK for health in later life. It uses large-scale data sources to chart experiences of different forms of work from mid life to State Pension age, and relationships with longevity and health in later life. It aims to consider the implications of this broader conception of work for policies on promoting longer working lives and reducing health inequalities. This study grew out of concern with the relationship between paid employment and health in early old age.

1.1. Total work

Work and health are fundamental and interlinked aspects of life. Employment has a number of important benefits with health implications – it provides activity, structure and variety to individuals, social status and a source of identity as well as opportunities for social contact (Warr, 1982). Perhaps most importantly, in industrialised societies, employment is generally the primary source of income for individuals and families and is connected to the distribution of power across society. Classical social theorists like Durkheim, Marx and Weber demonstrated the historical importance of employment as a

fundamental aspect of social stratification and the organisation of societal activity and interests. Such social stratification also affects population health, with research showing that the social gradient in health is an important contributory factor in health inequalities (Popham and Bambra, 2010). A key concern for this study, therefore, is to contribute to knowledge on forms of informal work as social determinants of health alongside formal paid employment. Some work is clearly informal or unpaid, but what is less clear is where to draw the conceptual boundaries around work. Where does work end and other productive activity begin?

Sociological theory and a consideration of social history can help with understanding the boundaries between work and other forms of productive activity. In the 1980s, Ray Pahl's seminal studies on *Divisions of Labour* (1984) and volume *On Work* (1988) challenged previous sociological focus on paid employment with historical examinations of different forms of work across market and domestic spheres. Pahl (1984) described the 'household-work strategy' used by households prior to the industrial revolution to collectively manage work within the household, as well as paid employment within the domestic sphere (like laundry) and beyond. With changes in employment in recent decades, there is renewed interest in understanding how to conceptualise the multitude of forms of work and the social relations that work entails (Parry, 2005).

Of particular interest for the present study are the ways that *total work*, labour efforts in aggregate for individuals and across society, has been considered. The notion of total work has been arrived at through differing theoretical and empirical approaches, including a focus on understanding women's total workloads (Kahn, 1991). Using a social historical approach, Miriam Glucksmann has developed a conceptual framework that distinguishes and delimits the boundaries of labour – the Total Social Organisation of Labour (TSOL) (Glucksmann, 2005, Glucksmann, 2009). This TSOL approach considers the way that the totality of labour is organised between institutions and activities in a given society, and work is considered to take many forms, which may or may not be remunerated. Glucksmann's approach, which develops Pahl's (1984) notion

of household work strategy, is a relational conception of labour, which highlights the interconnections between work in various institutions and through different activities despite the apparent separation of market work from other spheres. For example Glucksmann uses the example of UK supermarkets' production of ready-made meals to illustrate the redistribution of labour spent on food preparation between the market and households. Many of the people involved in producing and selling such goods are women who are now participating in paid employment, which drives them to purchase the meals to save time. In the past, such women might have spent time on unpaid food preparation at home.

Using quantitative survey methods, in time use or time budget studies, total work is used to describe the nature and aggregate amount of paid and unpaid labour that people do. For example, Jenkins and O'Leary (1997) considered changes in gender differences in time spent on different forms of work between 1974/5 and 1987. In addition to paid market, they considered different forms of domestic work such as housework (including, food preparation) childcare, odd jobs around the home including DIY, and shopping. Their findings very clearly show the persistently gendered nature of work activities with men spending considerably more time on odds jobs, while women undertake the majority of housework and childcare.

Gender is therefore an important aspect of any consideration of paid or domestic work activity. Time budget approaches to total work highlight the power of considering different forms of labour separately. The TSOL approach and relational conception of labour indicates the importance of a) understanding of the social context, b) situating an analysis of micro/individual or meso/group circumstances within a societal context, and c) acknowledging the complexity in delineating what counts as work, and how it might be measured. In the field of health inequalities research, Popay et al. (1998) have also emphasised the importance of understanding 'relational settings' in which people live – the places they inhabit in historical time and particular social environments.

In this study, the term **labour market position** is used to describe an individual's

position in relation to paid employment – what is described as ‘economic activity’ in the Census (Office for National Statistics et al., 2004) and other sources of official statistics. Technically, the labour market is comprised of people who are economically active, that is those who are in employment (employees and self-employed) or who are unemployed and seeking employment. Economically inactive people are those who are not in employment, including retired people, those long-term sick, those looking after their home or family, full time students, and a residual heterogeneous category of ‘others inactive’. Below the State Pension age, economically inactive adults are mainly out of work because they are students, due to ill health or for women, looking after the home or family (Barham, 2002). Many people who are considered economically active for the purposes of official labour statistics, will actually be engaged in informal or unpaid work. As there is no agreed term to cover both people in economically active and inactive groups, the term labour market position will be used in this study. **Informal work** is used to describe all forms of non-market work, which may or may not be recognised by individuals themselves as work, including domestic work. One particular form of informal work is **informal care giving**. There is as yet no consensus terminology around informal caring, or definition of the activity, though in general it can be taken to mean provision of unpaid support to someone who is sick, frail or disabled (Office for National Statistics et al., 2004).

1.2. Health and the life course

In considering the relationship between work and health from mid life to later life, a life course perspective informs this study and, in particular, the notion that health risks accumulate through the passage of life. Blane et al. (2007) argue that life course epidemiology emerged as a distinct aspect of social epidemiology during the 1990s bringing together three strands of social and medical research. First biological programming which focused on the importance of development in utero and in early life for determining potential functional capacity across the years of life. Second, birth cohort studies like the 1946 birth cohort, the National Survey of Health and

Development, were by then more mature and enabled the study of the accumulation of risk because study members had attained the age where chronic illnesses were more common. Third, health inequalities research had established that there was a fine grain social gradient in mortality risk, which could not be wholly explained by differences in the socio-economic distribution of behavioural risk factors for poor health like smoking. It is argued that the social structure plays a role in shaping this fine grain social gradient in mortality as individual experiences in different spheres of life cluster cross-sectionally and accumulate over time so producing different paths of relative advantage or disadvantage that influence health and mortality. This type of health inequalities research, and concern with the accumulation of relative health risk influences this study of the life course focusing on the sphere of work. It also recognises the interdependence between individual paths in different spheres of life such as work and health (Elder, 1978) – both an empirical and conceptual issue for the present study. The ONS Longitudinal Study is acknowledged as an important source of data for such research (Popay et al., 1998).

While we need health measures for empirical study, it also pays to be mindful that health is a complex and contested concept, and aware of the technical and theoretical limitations of any statistical health measures compared to other ways of investigating health. Johnson (2007) provides a helpful classification of different types of health definition. For example, the World Health Organization's aspirational definition of health that it is: "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948) is considered to fall within a class of 'assumptive' definitions, where health might be assumed provided certain conditions are met. However, the WHO definition has been criticised as being unattainable for most people in the world most of the time (Godlee, 2011).

Lay or common sense understandings of health indicate the spiritual, mental and physical dimensions of the concept. The way ordinary people think about health is diverse, can be complex and should not be neglected during the interpretation of statistical studies (Popay et al., 1998). For the purposes of the present statistical

research, I focus on mortality as a measure of health alongside other self-reported measures of general health, and mental health, which are discussed in Chapter 3. Mortality has the advantage of being an objective measure of a very clear biological event, but it does not reflect the social and biological pathways, which influence individual experiences of health (Jylhä, 2009); the other subjective measures used in the study are useful in that respect.

Experiences in early old age

There is clear evidence that people in industrialised nations are living longer and healthier lives. Cohort life expectancy projections for the UK show that, in 1981, a man aged 50 lived a further 28.5 years on average. By 2031, a 50-year-old man would typically live another 38.3 years (Office for National Statistics, 2013b). People are also remaining healthier for longer though improvements in health expectancies are slower and more mixed. For example, while men at age 65 would be living 1.2 years more in good health in 2009–11 than in 2000–02, the proportion of life spent in good health declined because overall life expectancy rose faster (Office for National Statistics, 2014).

Such changes in longevity and health expectancies in the *Third Age* have informed the focus of the present study. Laslett (1996) suggests that there are now four distinct life periods and that the Third Age is a period that has emerged as a distinct phase of the life course following retirement. In his theory, the ‘First Age’ is a period of childhood dependency, followed by a ‘Second Age’ of independence, employment and child rearing. It is argued that the transition that individuals make to their Third Age around retirement is marked by increased opportunities for leisure and community involvement, pursuit of interests and the realisation of individual potential. This period of life has also been described as early old age (Hyde et al., 2003). According to Laslett, the final phase of life, the ‘Fourth Age’ is characterised by deterioration in health and dependence (Laslett, 1996).

While some people may have more opportunities for self-realisation, in their Third Age, health and social inequalities related to experiences in earlier phases of life might

persist. For example differences in the accumulation of wealth indicated by the perceived adequacy of private pensions and being a homeowner are related to quality of life in early old age (Wiggins et al., 2004). There is also a social class gradient in life expectancy with almost five year's difference in life expectancy at age 65 between men in social class I and those in social class V (Office for National Statistics, nd.). Those in the most disadvantaged groups may be at increased risk of dying prematurely as they embark on a new post-retirement phase of life, or at the very least having a greater risk of already experiencing deteriorating health. Changing processes of ageing, therefore suggest that investigation of experiences of health and work in and around the normal period of retirement from employment – around the State Pension age – will be valuable for understanding health and social inequalities in later life.

1.3. Social and policy context for the study

The relationship between employment and health is of significant interest to policymakers and has long been studied by the UK Government. Since 1851, the Registrar General has made an assessment of occupational mortality around the time of each decennial census. Lately, the Government has increased policy focus on health and work with a Health, Work and Wellbeing policy initiative and the Government's Chief Medical Officer has shown interest in the public health implications of worklessness and population ageing (Davies, 2013) and focused on the issue of mental health and work (Davies, 2014). Recent social and policy developments, however, raise new questions about the health implications of work.

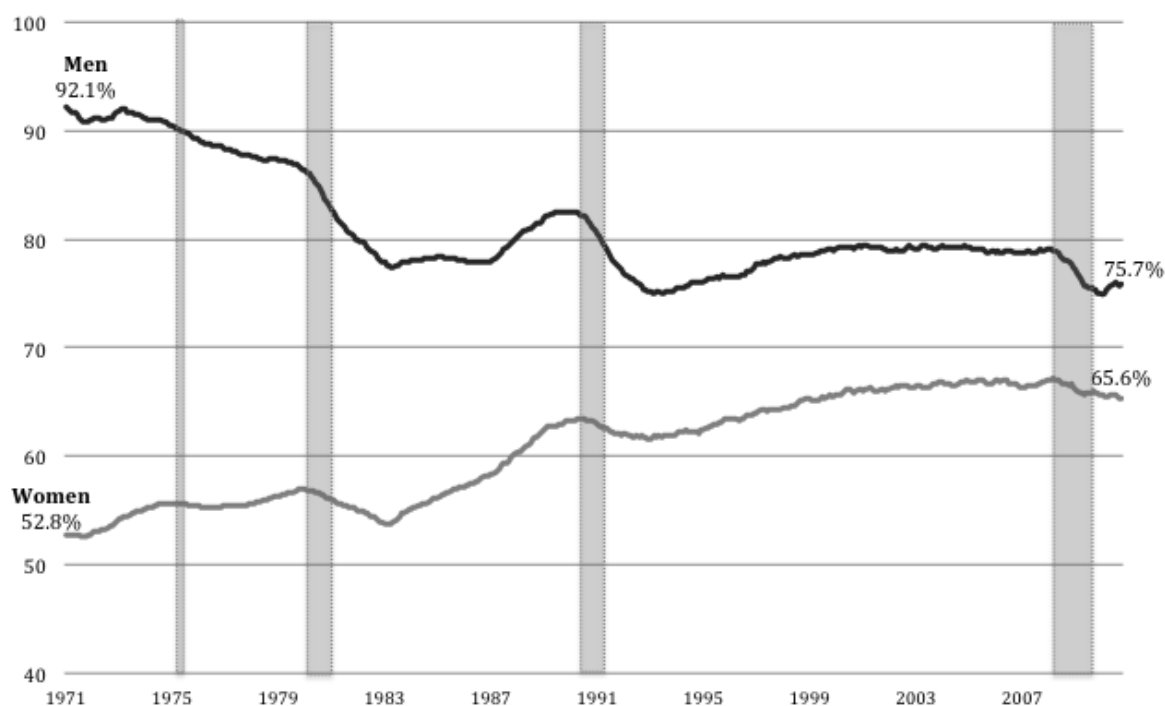
Rising employment among women

In the post-war period, women's participation in paid employment has grown with successive cohorts, generating debates about the effects of women 'going out to work' for their own and their children's health. Figure 1.1 shows the steady rise in employment among women since 1971 when the employment rate for women aged 16-64 was 53 per cent. By 2001, it had risen to 66 per cent. These figures underestimate the percentages in paid employment because the data shown are for the 16-64 age

group and the female state pension age was 60 years throughout the period shown. In addition, they do not account for increased participation in higher education among both men and women. As can be seen, the gap between men and women's employment rates narrowed significantly over the period shown. Following successive recessions, indicated on the chart with shaded columns, percentage point declines in employment rates have been lower among women than among men. Women's employment rates increased throughout the 1970s, while the period was marked by a decline in men's employment rates and the end of full employment.

Figure 1.1: Employment rates for men and women aged 16-64, 1971-2013. UK.

Shaded columns indicate periods of recession



Source: Labour Force Survey

The corollary of rising rates of women's employment has been growth, albeit rather slow, in the relative amount of time men spend doing domestic work such as cooking and cleaning (Gershuny et al., 1994, Sullivan, 2000) but large differences remain between men and women's contribution to housework (Scott, 1999). These gender changes in market and domestic work mark an evolution from the notion of a male breadwinner family. The male breadwinner family emerged in the mid-nineteenth century, producing a tacit social and economic deal between men and women that

incorporated clear expectations about the gender division of labour (Creighton, 1999). Though the notion of a male breadwinner is vaguely defined in much research literature (Warren, 2007), since the 1970s, there has arguably been a decline in the proportion of men working full time and providing the sole earnings for their families (Harkness et al., 1997). In Britain a model has emerged where male partners more commonly work full time alongside female partners working part time and, since the early 1990s, there has been a rise in dual-career couples where both partners work full time (Harkness, 2008). Nevertheless, a large portion of women's employment is part time. In 2001, in England and Wales 42.5 per cent of women aged 16-74 and were in part time employment compared with just 9.6 per cent of men (Office for National Statistics, 2003).

Some research suggests that the relatively higher rates of women's part time employment has been because of the challenge of combining work and domestic responsibilities but there is debate about whether women's participation in part time employment is a reflection of their choices, or due to structural constraints on their capacity to engage in full time employment. In Britain, Catherine Hakim is the main proponent of the former view. Hakim's preference theory (Hakim, 2007, Hakim, 2003) presents women's tendency to work part time in flexible, lower-level occupations as being related to most of them falling into a category she labels adaptive, choosing to alter the emphasis between their market work and families over their life course. Adaptive women, she argues, are able to exploit equal opportunities legislation and new flexible working arrangements that have become available to women to exert a choice to work part time. Other preference groupings include 'work-centred' and 'home-centred'. Hakim argues that all three preferences exist in both men and women but there are different distributions by gender, fewer men being home-centred or adaptive.

An alternative view is that there are normative and structural constraints on women's employment choices (McRae, 2003, Scott, 1999) such as the availability of childcare, views about whether women with young children should do paid work, and women partnering with and accepting men who do little domestic work. Critics of Hakim's preference theory have challenged the notion that most women can be

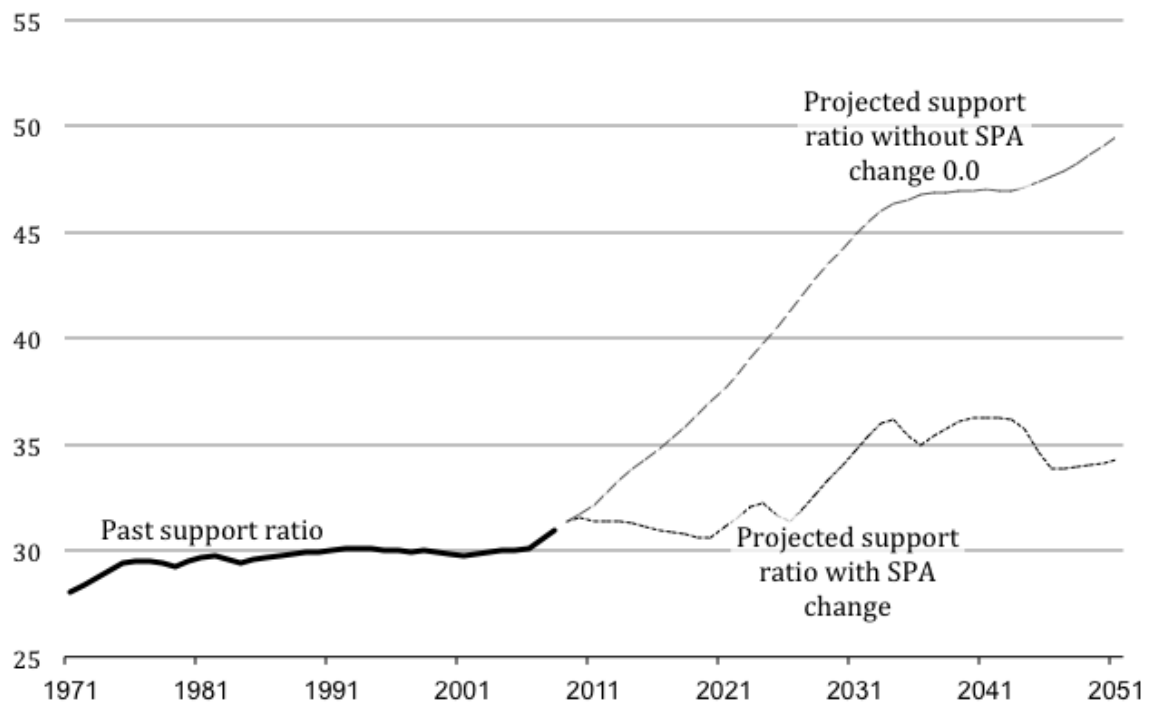
categorised into preference groupings variously on the grounds that it is a form of gender essentialism (Crompton and Lyonette, 2005); that preference categories are not necessarily fixed over time; and that the notion of preferences as a total explanation of work orientations is questionable (Crompton and Harris, 1998). In keeping with many traditional sociological debates on the relative importance of structure versus agency in shaping individual action, both perspectives may be useful for understanding the extent to which women are able to choose particular careers and configurations of total work. The amount of energy dedicated to employment and domestic work across women's lives is likely to be the outcome of structural constraints, norms and individual choices.

Population ageing and demographic change

The challenges of population ageing in industrialised nations are well known, and the appropriate social policy responses are the subject of much public debate. Official projections indicate that the proportion of people over State Pension age is set to rise relative to the working age population, despite planned increases to the State Pension age. In 1971, there were 28 people over State Pension age for every 100 people of working age, set rise to rise to 35 by 2031 (Figure 1.2). The costs of funding adequate retirement pensions for growing numbers of older people is now a significant challenge across industrialised nations. UK Government policy in response to population ageing includes strategies to extend working lives – in other words, for more people to delay retirement. This strategy raises questions about intergenerational equity, as successive cohorts will be required to retire later or face less generous pensions. However, in the historical context of industrialised societies, the current span of working life is rather short on average (Midwinter, 2005) and provides a limited timespan for accrual of pensions (Pensions Commission, 2004) giving some defence for policies aimed at delaying retirement.

Figure 1.2: Estimated and projected old age support ratios, UK, 1971-2051.

Old age support ratios per 100 people of working age



Source: Office for National Statistics, Population estimates and 2008-based principal population projections

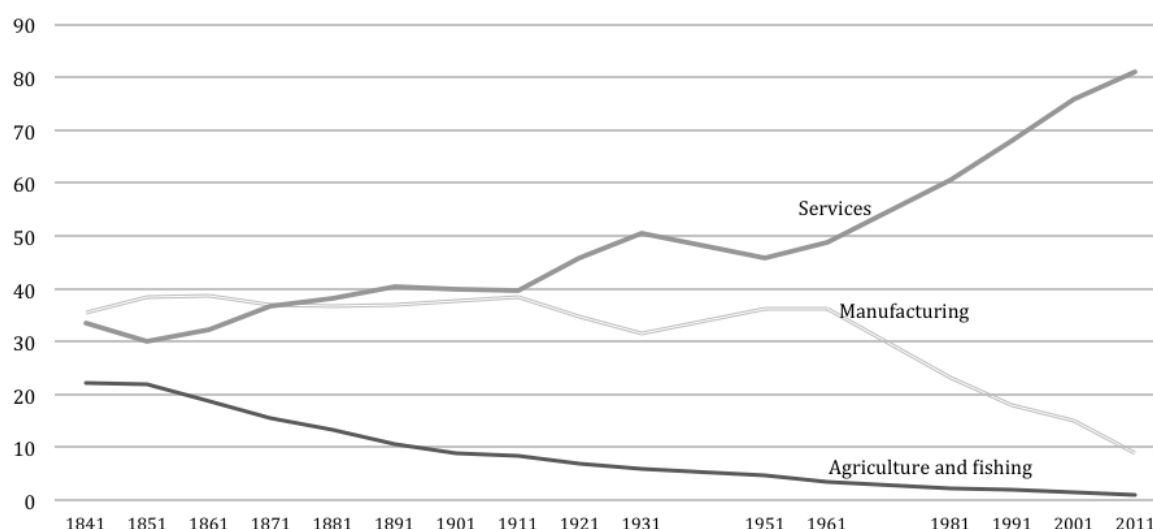
1. 'SPA' is State Pension age.
2. Working age population is defined as individuals aged 16 to State Pension age.
3. Ratios between 1971 and 2008 are based on mid-year population estimates. From 2009 onwards, ratios use 2008-based mid-year population projections.

Ageing populations in industrialised nations are, in part, a reflection of below replacement fertility levels (Caldwell, 2008). Falling fertility rates are related to other demographic changes including delays in marriage and childbearing (Smallwood, 2002), increases in cohabitation (Murphy, 2000), and a rise in divorce rates (Wilson and Smallwood, 2008). For example, the likelihood of couples deciding to cohabit before marriage has increased to such an extent that the majority of couples who marry now have cohabited before marriage (Murphy, 2000). Changes in family formation, such as the increase in cohabitation, the delay in marriage and postponement of childbearing reflect a fundamental shift in attitudes towards family life (Scott, 1999) which arguably have implications for the nature and patterning of work in people's daily lives.

Occupational and technological changes

New technologies and changes in the nature of goods and services produced across the economy have also influenced labour market jobs and changed daily life in Britain in the last four decades. ONS figures illustrate considerable industrial change since the mid nineteenth century (Figure1.3).

Figure1.3: Percentage of the workforce in selected industries, 1841-2011, Great Britain/England



Source: Office for National Statistics: 1841 – 2011 Censuses

1. Data from 1841 to 1911 covers Great Britain. Data for 1921 to 2011 covers England and Wales.
2. There is no Census data for 1941.
3. Information for 1971 was not included due to difficulty in creating a consistent industrial grouping

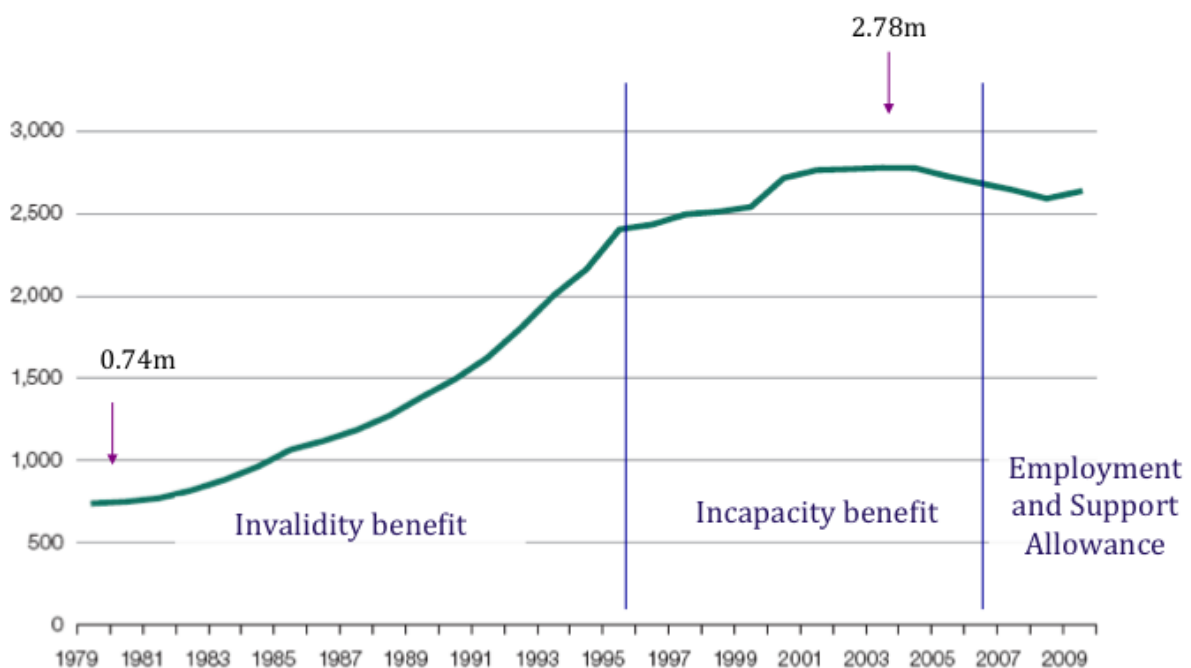
While the proportion of service workers has generally been growing steadily since records began in the mid nineteenth century, since the 1960s, there has been rapid growth in the proportion of the workforce employed in the service industry and corresponding decline in the manufacturing workforce. The proportion of workers employed in services grew from almost 49 per cent in 1961 to 76 per cent in 2001 (Office for National Statistics, 2013a). This industrial change is part a broader set of changes that have influenced experiences of work. New information and communication technologies in particular have also changed the nature of work tasks. There is evidence that such technological change alongside increasingly less secure and stable employment contracts is contributing to work intensification (Green, 2004). The ability to cope or adapt to these changes is likely to affect an individual's prospects in the

formal labour market.

Welfare change

Recent welfare developments have focused on reversing a trend of decreasing labour market participation since the 1970s for certain groups. Several policy developments have been targeted at two corresponding groups of economically inactive benefit claimants since the mid-1990s: long-term sickness benefit claimants and lone parents.

Figure1.4: Sickness benefit caseloads, UK, 1979-2010



Source: Department for Work and Pensions

There was a four-fold increase in the number of sickness benefits recipients between 1979, when there were 0.74 million people claiming Invalidity Benefit, and 2003, when almost 2.8 million people were in receipt of Incapacity Benefit (Figure1.4). One interpretation of this trend is that the rise in sickness benefits is due to administrative changes in the benefit regime. Some commentators have argued that the trend of sickness benefit claimants reflects growing 'hidden unemployment', in other words, that sickness benefits caseloads in the 1990s and early 2000s comprised a

growing group who would otherwise would have been technically unemployed and required to seek jobs. But apart from changes in how people are allocated in the benefits system, increases in sickness benefit claimants may also be a sign of changes in work environments that have been driven by deindustrialisation, reflecting reduced scope to move workers to lighter or less demanding duties as they age than had previously been the case (Beatty and Fothergill, 2005). A large proportion of people non-employed due to sickness are over 50, and more likely to have a history of manual jobs (Fothergill and Wilson, 2007). These people may have health conditions which, if not prompting their labour market withdrawal, make it less likely that they will be re-employed when considered alongside their age and skill level (Beatty and Fothergill, 2005).

In response to the considerable rise in the numbers of sickness benefit recipients between the mid-1980s and 2010 there have been several reforms to the long-term sickness benefits paid to people unable to work or seek work due to long-term illness or disability. In 2008, a new benefit, Employment and Support Allowance (ESA), was introduced. Changes introduced with ESA included more rigorous assessments of entitlement as well as periodic re-assessments, time-limited payments for certain groups, and requirements for preparatory work activity for some claimants.

Particular efforts have also been targeted to promote employment among lone mothers (Baker and North, 1999, Whitehead et al., 2000); and people aged over 50 (Fothergill and Wilson, 2007). Other general measures have focused on encouraging active work search rather than long-term inactivity. For example the 2010 Coalition government's welfare to work programme – called simply the Work Programme – and Universal Credit, introduced gradually to replace a variety of means-tested welfare payments and tax credits for people in and out of paid work with the aim of increasing financial incentives for employment.

As can be seen, there have been wide-ranging and, in cases, rapid societal changes related to employment and other forms of work, which are socially patterned by gender and socio-economic position. Correspondingly, many of the policy developments in

response to such changes are targeted at groups that are typically out of employment for longer periods, such as lone mothers or groups with low incomes, such as poor families with children. The health effects of the package of measures remain to be seen.

Continuing studies that increase knowledge of the relationship between work and health are therefore important from a public health perspective.

1.4. Purpose and perspective of study

This study grew out of concern with understanding the association between health and work in early old age responding to policy interest in promoting labour market participation among people aged over 50; to reduce long-term sickness benefit receipt and to extend 'working lives' and promote saving for adequate retirement pensions. It is partly motivated to understand why certain groups experience ill health associated with their labour market position; whether it is due to health selection or causal effects of being out of work. In light of the significant changes to the nature of work that have been described, the primary purpose of this research is to consider the implications of different forms of work - paid employment, domestic work and informal care giving - for health in later life. Much research on employment and health among older people is particularly concerned with the transition to retirement. Studies considering the interplay of paid work, family and health have tended to focus on earlier years of adult lives occupied by child bearing and child rearing. Informed by a life course approach, the ONS Longitudinal Study and British Household Panel Survey are used to investigate relationships of each type of work in mid life with premature mortality, self-reported illness and psychological health in later life.

A researcher's personal history can be an influential factor in research, informing the initiation, design and conduct of a study as well as conclusions drawn. This thesis reflects my interests and knowledge both as an academic researcher trained in sociology, a professional Government Social Researcher, and a central government policy official. As this thesis has developed, I have been on a journey of professional development, which began with a focus on researching health inequalities at the UK

official statistics agency, examining inequalities in mortality in particular. However, the bulk of my thesis was completed while I worked at the UK Department for Work and Pensions on issues of health and work as a researcher and then a policy official. With this experience I have developed relatively detailed knowledge of the policy context and formed opinions about the research literature I used to inform policy. I have been asked to answer policy research questions as a government researcher and, in my turn posed questions as a policy official about the relationship between work and health for practical purposes – to inform the design, implementation and evaluation of policy measures. One thread running through this thesis, therefore, is a concern with the practical implications of research for policy. It is informed by a social policy perspective, but draws on a range of disciplines including sociology, social epidemiology, and demography. Most importantly, it is concerned to identify those groups who are most disadvantaged and may warrant particular attention in strategies to increase health equity.

1.5. Organisation and overview

In the next chapter I consider research literature on the relationship between different forms of work and health. It focuses on review-level evidence and identifies the relationship between particular work positions and health, and considers possible mechanisms for the relationships seen. Chapter 3 then turns to the aims and objectives of project informed by existing literature and considers the details of the two-large scale data sources used for this study – the ONS Longitudinal Study, and British Household Panel Survey – and the statistical methods used.

The results of investigations are presented in three chapters. Chapters 4 and 5 focus on the relationship between formal labour market position and health. Trends in mortality by labour market position are investigated in Chapter 4, using the ONS Longitudinal Study. There is a great deal of stability in the relationship between labour market position and mortality, despite the considerable social and labour market changes that have been described. Chapter 5 then turns to the relationship between

trajectories of labour position and selected health measures available in the British Household Panel Survey. This shows the diversity of labour market roles from mid life to later life, and confirms the health benefits of long-term stable employment. Here I also consider the association of domestic work with health, comparing people who are in paid employment with those who are not turn. In Chapter 6, I turn to the relationship between combinations of informal caring and labour market role and health. The results of all investigations are interpreted in Chapter 7 where I also discuss theoretical and methodological implications for future research. Overall conclusions about the substantive findings are drawn in Chapter 8 along with the social policy implications of the findings – a key concern for this study.

2. The influence of work on health and mortality

While there is a great deal of evidence on the relationship between paid employment and health, this is only part of the story on health and work. It is well known that paid employment is not the only form of work. On the contrary, as seen in Chapter 1, for a variety of reasons women have been less likely to participate in the formal labour market than men but surely do work in other ways. Apart from evidence on paid employment and health, other streams of research have considered the health implications of combining multiple social roles like employment and caring for children. In this chapter, I consider research evidence on the health effects of work, using a broad conception of work. The findings of a systematic scoping review of literature are reported on the health effects of different formal labour market positions are reported. The final section of the chapter takes a broader view on work and health and considers the findings of research literature on different forms of informal work and health.

2.1. Method

The overall approach used for reviewing evidence in this chapter is intended to balance objectives of replicability and the reduction of bias with a discursive, interpretive approach that will inform the concepts and measures used in the present study. Given the large body of literature on labour market position and health, and the existence of several high-quality conceptual reviews (e.g. Bartley, 1994) and empirical reviews (e.g. Milner et al., 2014) in this area, a review of reviews (Centre for Reviews and Dissemination, 2009) was used to examine the range of research findings. This aimed to summarise the key findings of this literature and provide new insights in several ways.

1. The associations of positions other than unemployment with health are considered, as much of the evidence is dominated by studies on unemployment and health. This

is the key aim to inform broader understanding of the association between labour market position and health.

2. A range of health outcomes including mortality, mental health problems and other common chronic health problems are considered within a structured review framework. While some narrative reviews have looked at a range of health outcomes (Bartley, 1994, Waddell and Burton, 2006) recent systematic reviews have focused on mortality, mental health or general morbidity.
3. Evidence on the mechanisms underlying the relationship between labour market and health is synthesised and connections made with theoretical literature.

A narrative review was used to explore literature, including primary studies on the relationship between informal work and health. This looks at literature considering the health effects of multiple social roles, domestic work and health and total work. This approach was judged to be appropriate for considering the literature on the relatively broad field of research on informal work and health, which has several overlapping sub streams.

2.2. Labour market position and health

This section presents the findings of a review of review-level studies relating to labour market position and health. The review aimed to answer the following questions:

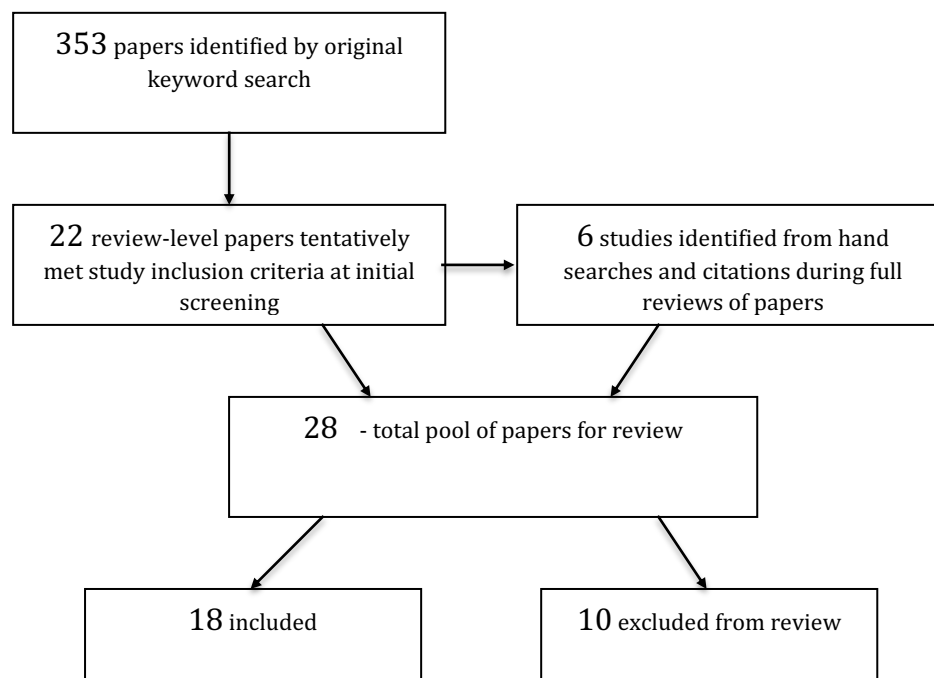
- What are the nature, direction and strength of relationships between labour market position and health?
- What mechanisms drive the observed relationships?

Literature searches were performed following the method used by (McClean et al., 2005). Searches of Medline, Embase, Web of Science and ASSIA and Sociological Abstracts were performed using MESH terms and keywords related to unemployment (Appendix 1). The search was restricted to review-level studies in English language published since 1990. Keyword searches of bibliographic database yielded 353 papers one duplication was removed, and a further six papers were identified by hand searches

and follow-up of references during initial examination of papers.

The review focuses on adults of all ages (people aged 16 and over) and studies from industrialised countries where findings may be transferable to the UK. Occupational health or vocational rehabilitation studies which focused on interventions to help people with health problems to stay in or return to work were excluded as they were beyond the scope of the search question. A total of 18 reviews were included in the study when full papers were examined.

Figure2.1: Search and selection of papers on labour market position and health



Selected studies were appraised using a data extraction form (shown in Appendix 1) to enable critical appraisal of the information. This included considering the following issues:

- **Relevance to the topic.** Only studies that consider the primary question of the relationship between labour market position and health were selected.
- **Review methods.** The papers were screened to collect information on the review method, for example, whether a narrative or conceptual review approach was used or whether a systemic review or meta-analytic method was used.
- **Quality.** The methods used were considered in detail to assess whether they were

appropriate and defensible. This included examining whether attempts to combine results were reasonable, the comparability of studies had been considered qualitatively or using formal tests, and whether there was an explicit discussion of any between-study variation in results.

- **Results.** A range of information about the results was included, including information such as the health outcomes and labour market variables used. In addition, the number of studies included in each review was recorded. The results were examined to determine the key findings, explanations for variations observed between groups and any issues that would affect generalizability to a UK population.

In addition a narrative summary of the study was produced. This enabled a more interpretive assessment of the degree to which the findings indicated evidence that the observed effects were due to social causation, health selection, or whether both factors were at play, and enabled limitations or interesting issues to be noted. The information extracted enabled an overall assessment of the review type and quality distinguishing reviews that attempted to use replicable methods (where the quality was judged) from narrative reviews (where the quality was not rated). Reviews were deemed to be 'good' quality if the methods were transparent and all of the quality indicator described had been largely met. Where the review appeared to be of reasonable quality but important aspects of the methods had not been described explicitly, the results were considered to be 'fair'. A third category reviews of, which attempted to use replicable methods but which had avoidable limitations, was also noted. In such cases, studies lacked a transparent search strategy or other key details such as how studies were scoped, or the total number of studies included.

The findings of this examination of review-level studies are split into streams, which respectively consider a) the relationship between unemployment, economic inactivity and health, and b) the relationship between employment and health. The consideration of each theme begins with a description of the number and range of review studies identified. Next, findings of review studies are discussed to indicate

possible mechanisms for observed relationships between particular social positions and health, the overall strength of evidence and research gaps, drawing on selected primary studies to illustrate the range of research findings and provide further insights on areas for development.

Unemployment, economic inactivity and health

Much research is concerned with unemployment rather than other non-employed positions. A total of 14 evidence reviews on the topic of unemployment and health were selected (Table 2.1). Of these, two also considered groups who were economically inactive (Roelfs et al., 2011, Waddell and Burton, 2006). Half (eight) of the reviews considered a range of physical and mental health problems or general ill-health, six studies looked at mental health outcomes and one review (Roelfs et al., 2011) focused exclusively on mortality. In general, the reviews included were evidence reviews using systematic approaches to summarise the evidence, and seven used formal meta-analytical approaches (van Rijn et al., 2014, Roelfs et al., 2011, Paul and Moser, 2009, Paul and Moser, 2006, McKee-Ryan et al., 2005, Milner et al., 2014, Murphy and Athanasou, 1999). The depth and sophistication of meta-analytic studies in this area generally improved with successive reviews. For example, it is evident that Paul & Moser's (2009) study on mental health and unemployment develops the review by Murphy & Athanasou (1999) by including a broader selection of studies and testing explicitly for health selection effects.

Nature and strength of relationship between unemployment and health

Review level evidence consistently suggests that unemployment is associated with poor health. This relationship was confirmed in all review studies considered. The results of empirical (rather than conceptual) reviews show that:

- Unemployment is associated with a range of poor health outcomes including worse general health, (McClean et al., 2005) psychological distress and mental illness (Paul and Moser, 2009), suicide (McClean et al., 2005) and all-cause mortality (Roelfs et al., 2011)

- Meta-analytic results pooling data from 15 industrialised nations and covering 20 million people indicate that compared with employed people, unemployed people face a significantly increased risk of death - 78% higher among men and 37% higher among women (Roelfs et al., 2011)
- Job loss is associated with a moderately worse mental health, which may nevertheless have significant implications for the population prevalence of mental illness (Paul and Moser, 2009)
- The risk of ill health rises with longer durations of unemployment (Herbig et al., 2013)
- The association of unemployment with health is generally more pronounced for men than for women, and for younger people than people of older working ages

The range of primary studies included in reviews indicates that these relationships exist across a range of nation-states and welfare regimes and have remained stable over a considerable period of time – since the 1970s at least. For example, evidence on the relationship between unemployment comes from longitudinal studies in Finland (Martikainen, 1990), Denmark (Iversen et al., 1987), and England and Wales (Moser et al., 1984, Harding S, 1997) (Moser et al., 1986, Moser et al., 1987, Moser et al., 1988). From the studies reviewed, there was apparently some evidence that the health effects of unemployment do not vary significantly with the amount social protection provided through unemployment benefits. However, it has also been found that the sensitivity of all-cause mortality rates in European countries was at least partly related to level of social protection (Stuckler et al., 2009). This suggests that measures to improve the material circumstances of unemployed people would be insufficient to redress their mortality disadvantage.

Table 2.1: Health effects of unemployment: reviews published since 1990

Review and short title	Review type and quality ***Good ** Fair * Acceptable but avoidable limitations ° Narrative review	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
Reviews examining a range of health outcomes						
van Rijn et al. (2014) – Poor health and exit from employment	Meta-analysis.** Sound overall approach but generalizability is limited because of substantial between-study variation in health and labour market measures.	General self-rated health Mental health problems Chronic diseases (including musculoskeletal disorders and respiratory conditions)	17 (on risk of unemployment)	Poor health is a risk factor for job loss – 7% of transitions from employment to unemployment can be attributed to poor health. Pooled estimates show that the likelihoods of becoming unemployed were higher among employed people with poor self-rated health (RR 1.44, 95% CI 1.26-1.65), mental health problems (RR 1.80; 95% CI 1.4-2.31) or chronic diseases (1.31; 95% CI 1.14- 1.50).	Selection (causation not considered). When considering the effects of poor health on different types of exit from employment, the Population Attributable Fraction (PAF) attributed to poor health was 36.9% for take up of a disability pension compared to 7% for unemployment and 4.7% for early retirement. This suggests that poor health is a relatively modest contributor to unemployment although other aspects of social position that are linked to health may also be important.	No UK studies of transition to unemployment included. Results are heavily dependent on welfare context. For example, a ‘disability pension’ does not exist in the UK in the same way as Nordic countries and the Netherlands.
Herbig et al. (2013) - Health in the long-term unemployed	Evidence review.* Seems intended to inform German policy and practice but little discussion of how review was scoped.	General morbidity All-cause mortality Mental health problems Cancer CVD	38	Long-term unemployed people are a heterogeneous group who experience greater risks of both physical and mental health problems than employed people. The risk of ill health rises with longer durations of unemployment.	Evidence for both selection and causation. Refers reader to findings of Paul and Moser (2009), McKee-Ryan et al. (2005) and Roelfs et al. (2011).	Focuses on long-term unemployed people (those out of work for over a year) among whom there had been little success with increasing job entry

Review and short title	Review type and quality ***Good ** Fair * Acceptable but avoidable limitations ° Narrative review	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
Roelfs et al. (2011) – Unemployment and all-cause mortality	Meta-analysis and meta-regression.*** Systematic search and discussion of limitations and transferability issues.	All-cause mortality	42	Confirms an association between unemployment and raised risks of all-cause mortality, which has not changed significantly since the 1970s and appears to persist for individuals in the short term and longer term (over 10 years). The magnitude is larger for men (HR 1.78) than for women (HR 1.37) and for people below the age of 50 years.	Weight of evidence for causation. The study found some evidence of health selection - Hazard Ratios that controlled for health behaviours were significantly lower than those that did not. The findings better support a causal explanation as controlling for health at study baselines did not substantially affect estimated mortality risks among unemployed people.	Data from 15 industrialised countries covering 20 million people in period from 1967 to 2005. Effect of region (welfare regime) was considered with no indication that it significantly affected the association between unemployment and mortality. Sensitivity analyses showed the period did not affect the size of HRs.
Waddell and Burton (2006) – is work good for health?	Evidence review* Commissioned by the UK Department for Work and Pensions to inform a strategy document. Described as a best evidence synthesis, but limited information on the search strategy used e.g. the number of papers selected.	General morbidity All-cause mortality Mental health and psychiatric morbidity Healthcare use	27 (on unemployment)	Unemployment is generally harmful to health. Risks included higher mortality, poorer general health, poorer mental health and higher healthcare use.	Evidence for both selection and causation. Though not examined in any great detail, the authors suggest that the positive relationship between unemployment and health is partly selection, but also causal.	Includes information from policy papers as well as academic literature, and therefore some of the evidence statements appear to reflect consensus opinions.

Review and short title	Review type and quality ***Good ** Fair * Acceptable but avoidable limitations ° Narrative review	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
McLean et al. (2005) – worklessness and health	Evidence review – review of reviews ***Although not a systematic review, this review uses a transparent approach to selecting and examining review level evidence. However, it does not include an assessment of study quality	General morbidity All-cause mortality Mental health and psychiatric morbidity	12	Unemployment is linked with increased mortality in the short to medium term, and strongly linked with psychiatric morbidity. Suicide risk increases within a year of job loss. There is a 20% excess risk of death for unemployed men and their wives.	Evidence for both selection and causation. Finds evidence for a relationship between unemployment and health but suggest that there is insufficient evidence to suggest that unemployment causes poor health.	Considers a range of indicators of social position that may also affect health. There was limited information in relation to gender and age – particularly for early retirement among older workers. Identify a range of research gaps including a lack of attention to life course influences that may affect resilience.
McKee-Ryan et al. (2005) – psychological and physical wellbeing during unemployment	Meta-analysis*** Systematic search and discussion of limitations and transferability issues	Mental health Life satisfaction Subjective [self-reported] physical health Objective physical health measures (e.g. cortisol)	52 (cross-sectional) 10 (longitudinal)	Cross-sectionally, being unemployed is associated with poorer mental health ($d = -0.89$) and physical health ($d = -0.36$). Job loss – becoming unemployed – is associated with a decline in mental health ($d = -0.38$)	Weight of evidence for causation though selection cannot be ruled out entirely. In longitudinal follow-ups people who were unemployed at baseline and employed by follow-up had greater wellbeing than those who did not enter employment ($d = 0.10$) but this effect was not significant (95% CI $-0.07 - 0.28$). Argues that ‘it is appropriate to state the evidence is strongly supportive of a causal relationship because there is consistency in results across multiple kinds of studies and hundreds of data points	Significant moderating factors include duration of unemployment (longer spells worse) and life stage (school leavers have worse health). Unemployment benefit regimes did not seem to affect relationship significantly. However, there is little explicit discussion of the countries and time periods covered by the studies making it difficult to interpret this finding

Review and short title	Review type and quality ***Good ** Fair * Acceptable but avoidable limitations ° Narrative review	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
Jin et al. (1995) – Impact of unemployment on health	Systematic review** Aimed to examine evidence for causality using Bradford-Hill criteria	All-cause mortality Cause-specific mortality Mental health and psychiatric morbidity Healthcare use	46 primary studies	Evidence suggests a strong link between unemployment and a range of poor health outcomes, particularly all-cause mortality (SMRs above 1.20 among men) and deaths due to cardiovascular disease. Some evidence for increased healthcare use among unemployed people.	Weight of evidence for causation. Using the Bradford Hill criteria to assess evidence, find that the weight of evidence is for a causal effect. More investigation of mediating and confounding factors is needed.	Covers evidence from 1980s and 1990s. Uniquely includes clear summary of evidence showing association between increased healthcare use from studies in Canada, the UK and US. Little, if any evidence on the effects of unemployment among women.
Bartley (1994) – Unemployment ill health: understanding the relationship	Narrative review. ° Examines mechanisms for the relationship between unemployment, ill health and mortality with a focus on causal explanation. Some limited information on search strategy	General health Mental health Health behaviours Mortality	Not stated (87 references)	Four mechanisms are identified 1) Poverty – unemployment causes financial strain, which has psychological and physiological consequences in the short to medium term. 2) Stress – unemployment is a stressful event with psychological and physical health effects. Stress may occur when unemployment is anticipated. 3) Health damaging behaviours – there is disagreement about whether they occur more frequently among unemployed people 4) The negative effect of unemployment on subsequent work histories, which may be related to other detrimental life events and reflect general labour market disadvantage.	Evidence for causation and focussed on understanding causal relationships. Selection (in combination with other mechanisms) may be partial factor in the increased mortality and morbidity risks following unemployment but is unlikely to be the main explanation.	Unique in the focus on considering competing hypotheses for relationship between unemployment and health.

Review and short title	Review type and quality ***Good ** Fair * Acceptable but avoidable limitations ° Narrative review	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
Studies examining mental health						
Milner et al. (2014) – Unemployment and suicide: cause and effect	Meta-analysis*** Using studies with a temporal investigation of mental health unemployment and suicide to consider causal effects of unemployment	Suicide	5	Unemployment was associated with increased relative risk of suicide (RR 1.41, 95% CI 1.21 – 1.60). Controlling for prior mental health, the magnitude of this effect was reduced but remained statistically (RR 1.15, 95% CI 1.00-1.30)	Unclear. Some evidence for selection, some evidence for competing causal explanations. Disentangling the causal pathway is problematic. Mental health problems prior to unemployment attenuated a large portion of the relationship between unemployment and suicide suggesting that much of it is due to pre-existing poor mental health. However, evidence also shows that mental health worsens with unemployment. Increased suicide risks after unemployment might also be attributable to mental health problems arising after unemployment, or they could be modified by mental illness depending on when it first occurs (before or after unemployment).	Included primary studies were based on retrospective cohort studies constructed from existing administrative records. The authors point towards the lack of studies with prospective measurement of mental health prior to and after job loss. Data are exclusively from Nordic countries (Sweden and Denmark) and may not be applicable to countries with other welfare regimes.
Paul and Moser (2009)	Meta-analysis***	Mixed distress, depression, anxiety, psychosomatic symptoms, subjective well-being, self-esteem	86 (longitudinal studies)	Psychological distress increases with job loss (d =0.19, p<0.001)	Weight of evidence for causation. The findings were suggestive of some relatively weak selection effects. In longitudinal follow-up, people who were employed at baseline and unemployed by follow-up had greater signs of distress at baseline (d = 0.23, p <0.001)	Also includes a review of cross-sectional studies, which suggests that more affluence and less income inequality in a country moderate the negative effect of unemployment on health.

Review and short title	Review type and quality ***Good ** Fair * Acceptable but avoidable limitations ° Narrative review	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
Paul and Moser (2006) Incongruence unemployment and health	Meta-analysis** Considers whether incongruence between an individuals' commitment to work and their employment position is associated with poor health	Mental health	42	High levels of employment commitment (e.g. Protestant work ethic) among unemployed people are associated with psychological distress ($r=0.19$) and psychiatric morbidity, for example depression ($r = 0.18$). The association tends to be higher among people with low levels of education.	Not considered.	Very few studies (5) had longitudinal designs. Analysis of these studies was generally supportive of the findings but there is insufficient power to consider prior social selection of work commitment and health.
Fryers et al. (2003) – Social inequalities and common mental disorders	Evidence review** Aims to explore evidence on the relationship between indicators of social position and mental health	Mental health	7 (studies with employment status information)	Of 7 studies, 6 showed a positive association between unemployment and common mental disorder.	Not considered	Income, assets and material living standards were most consistently associated with mental health across studies.
Murphy and Athanasou (1999) Effect of unemployment on mental health	Meta-analysis* Review of studies published 1986-1996 in English language using longitudinal design and with standardized psychological tests as a dependent variable	Depression (e.g. Beck Depression scale) General psychiatric morbidity (e.g. GHQ)	5 (on transition from employment to unemployment)	The included studies suggest that unemployment has a negative though relatively small effect on mental health ($d=0.36$)	Equivocal. Discussion focuses on studies which make attempt to adjust for health selection effects. Only 1 of the 5 included studies that examines moves from unemployment to employment appears to directly consider selection. However, although suggest that the weight of evidence is for causation.	Only a handful of studies with disparate designs are included in this review, which spans a relatively short time period. The evidence presented is therefore relatively weak when compared with other reviews on this topic.

Review and short title	Review type and quality ***Good ** Fair * Acceptable but avoidable limitations ° Narrative review	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
Ezzy (1993)	Conceptual review. ° Considers competing theoretical explanations for the mental health effects of job loss	Mental health	n/a	Argues that most theories deal inadequately with the temporal aspects of job loss as a transition the experience of being unemployed, and the effects of moderating variables.	n/a	Theories reviewed include the stages model, Jahoda's functional model, Warr's (1982) vitamin model, Fryer's focus on agency (1986), and O'Brien's (1985) work on personal control.

Mechanisms

Two main types of explanation for the association between non-employed labour market positions and health are present in the literature: selection effects and causal explanations. Health selection occurs if people with poorer health face a greater risk of unemployment, or are less likely to find employment if unemployed. Selection out of paid work can occur for a variety of non-health reasons, like education which may also be related to health (Martikainen, 1990) and the extent of selection is related to the performance of the economy (Bartley and Owen, 1996). During periods of high unemployment, all people have a higher risk of losing their jobs, so that relatively larger numbers of people in good health, or more advantaged circumstances become unemployed and those with health problems or disadvantaged social positions, comprise a smaller part of the unemployed population.

A range of competing hypotheses exist to explain the likely causal relationship between unemployment, poor health and mortality. The conceptual reviews examined respectively consider the psychological effects of job loss (Ezzy, 1993) – which are generally descriptive rather than explanatory models – and other general pathways between unemployment and ill health (Bartley, 1994). Bartley (1994) identifies four mechanisms that explain the relationship between unemployment and ill health.

1. Poverty during unemployment resulting in financial strain has psychological and physiological consequences in the short to medium term.
2. Unemployment is a stressful event with psychological and physical health effects, with some evidence that stress may occur when unemployment is anticipated.
3. Health damaging behaviours like smoking tobacco are argued to have some bearing on the pathway between unemployment and health. There is disagreement about whether such behaviours occur more frequently among unemployed people but clear evidence that suicide risk is higher among unemployed people.
4. The relationship between unemployment and disadvantaged work histories, which may be related to other detrimental life events and reflect general labour market

disadvantage.

Material disadvantage during a period of unemployment may also contribute to poor health if unemployment benefits do not provide a minimum income for healthy living (Morris et al., 2000). It was estimated that, in 1999, the minimal costs required for health through adequate nutrition, physical activity, housing and psychosocial relations was £131.86 a week for a young single man aged 18-30, compared with unemployment benefit of £51.40 for men aged 25 and over. Another pathway from unemployment to ill health is related to the stigma and shame that unemployed people may face (Eales, 1989, Rantakeisu et al., 1999, McManus et al., 2012). This may account for the smaller effects of unemployment seen among women (where the social norms to be in employment are weaker) and among older people who may more easily adopt a sick role or report early retirement than unemployment.

Review-level studies indicate that both causal and selection effects occur, though the weight of evidence appears to be in favour of causal explanations. Non-negligible selection effects do exist, however, and are an important part of the explanation for the relationship observed between unemployment and ill health. For example Bartley (1994) observes that the increased risk of mortality among unemployed people in the long term is in part a reflection of general labour market disadvantage among this group – that a spell of unemployment increases the risk of subsequent unemployment. If, given the evidence presented, we accept that unemployment has a negative effect on health, this would suggest that a portion of those exposed to unemployment are in fact in the midst of a cycle where precarious labour market experiences mutually reinforce poor health. It is notoriously difficult to disentangle health selection effects from causal links between unemployment and health in data, but this in part reflects the fact that it is also difficult to distinguish between the two types of attribution if one considers the issue carefully. Thus underlying both selection and causal pathways between unemployment and health some common issues are a) disadvantaged long-term labour market histories and b) stress reactions. Where individuals anticipate unemployment, stress reactions may precipitate health problems and job loss in a process of selection

out of work. Likewise, stress reactions occur on job loss as individuals adjust to precarious circumstances. Thus stress reactions lie on the causal pathway from unemployment to health. Milner et al. (2014) have argued for more theoretical attention to the temporal sequence of events and causal assumptions in research on unemployment and suicide to more rigorously examine factors that may confound, mediate or moderate the relationship between unemployment and health.

Employment and health

Studies that look at transitions between employment and other labour market positions or at variation within the employed population are informative for understanding the relationship between employment and health. In addition to studies highlighting the health effects of being unemployed or economically inactive, six reviews on the topics looking at specifically at the state of paid employment were identified (Table 2.2). Only reviews where the primary focus was to investigate health variation within the employed population or the effect of movements into paid employment position were considered. Two reviews which dealt with the effect of temporary or insecure employment were identified (Kim et al., 2012, Virtanen et al., 2005), two considered transitions into employment (Rueda et al., 2012, Murphy and Athanasou, 1999) and two looked at both issues (van der Noordt et al., 2014, Waddell and Burton, 2006). The reviews tend to identify that research investigating the effects of employment on health specifically, is less common than research dealing with the association between unemployment and health.

The review findings suggest:

1. *Secure, permanent employment is beneficial for health, particularly psychological health.* The body of evidence on variation within the employed population focuses on the effects of temporary, insecure and precarious employment compared with secure, permanent jobs. It suggests that such employment has effects on the psychological health of employees in particular. For example Virtanen et al. (2005) found that taken together, the studies they analysed suggest that temporary workers

have increased odds of psychological distress (OR=1.25, 95% CI 1.14 -1.38).

2. *Movement into employment from non-employed roles is beneficial for health.* While health selection effects may be at play, the highest quality study focused on this issue suggests that most studies also indicate causal effects (Rueda et al., 2012).

Mechanisms

When considering movements into employment and health, and the potential causal pathways to observed relationships, it might be expected that many of the mechanisms that lead to poor health among unemployed people would be reversed to a degree when people take up paid work. However, Rueda et al. (2012) find there is less evidence to enable understanding of whether the negative health effects of unemployment are swept away entirely by job entry. They cite Ginexi et al. (2000) who found that return to work within six months of unemployment was associated with larger reductions in depressive symptoms compared with job entry following a longer period of unemployment.

But, why are temporary or precarious employment roles more damaging for health than permanent secure ones? Virtanen et al. (2005) describe a range of health selection effects that may operate among temporary workers. Contextual issues such as the unemployment rate and proportion of temporary employees in the workforce also affect the relationship between temporary employment and health. Lower unemployment and smaller proportions of temporary workers increased levels of poor health among temporary workers. This may imply stress and constraint among temporary workers in situations where they face competition or less protection, which is damaging for health. Variations in results related to social context effects and durations in a particular labour market indicate that a longitudinal perspective on exposure to different roles is needed to fully understand the health effects of labour market position. The effects of exposure to different labour market positions will vary not only with the state of the labour market (Martikainen and Valkonen, 1996), but also according to the individual's prospects of returning to work, in turn shaped by their social background and labour market history.

Table 2.2: Health effects of employment: reviews published since 1990

Review and short title	Review type and quality	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
	***Good					
	** Fair					
	* Acceptable but avoidable limitations					
	°Narrative review					
Reviews examining variation within the employed population						
Kim et al. (2012) – Welfare states, flexible employment, health	Systematic review*** Considers how welfare regimes can affect the relationship between flexible employment and health. Adopts a systematic narrative review approach to inform theoretical development and due to diversity of study designs.	<i>A wide range of outcomes including:</i> General self-rated health Mental health problems Coronary heart disease Work sickness absence	104 studies examining job insecurity or precarious employment	Across welfare regimes, precarious workers tend to report worse health. The exception is Scandinavian nations, where precarious employees do not report worse health than other employees. Egalitarian welfare policies used in Scandinavian states may buffer negative health effects of precarious employment.	Selection effects not considered in detail. The authors point towards the potential for ‘healthy worker effects’ to result in selection of healthier people out of the unemployment into precarious or insecure jobs. This could be one reason for some studies finding relatively good health among precarious or insecurely employed workers.	Included 9 UK studies on job insecurity and just one on precarious employment. Much of the UK evidence in job insecurity comes from the Whitehall II study of Civil Servants.
Virtanen et al. (2005) – Temporary employment and health	Systematic review, meta-analysis and meta-regression*** Meta-regression used to examine source of heterogeneity between studies e.g. proportion of women or contextual factors. Included studies were a mix of longitudinal studies (mainly prospective) and cross-sectional studies	Psychological distress Physical health General health Mortality Musculoskeletal disorders Sickness absence Occupational injuries	27	Temporary employees have a higher risk of morbidity/mortality (combined risk for all studies, OR = 1.13; 95% CI 0.88-1.45) and in particular a greater risk of psychological distress (OR = 1.25; 95% CI 1.14-1.38). Morbidity effects were stronger where the unemployment rate was lower.	Unclear. Points to a range of health-related selection effects that may be in play, but operating differently depending on whether someone is a temporary worker or has a more disadvantaged labour market history.	

Review and short title	Review type and quality	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
	***Good					
	** Fair					
	* Acceptable but avoidable limitations					
	°Narrative review					
Reviews examining health effects of movements into employment						
Rueda et al. (2012) – Return to work and health	Systematic review*** Very clear and detailed discussion of search strategy and review methods. All longitudinal prospective studies.	Both physical and mental health outcomes (little detail specified in relation to each study reviewed)	18 studies looking at transition from unemployment to employment	Return to work from unemployment is beneficial for health – this was observed in 15/18 studies. Equivocal evidence on whether return to work completely reverses the detrimental health effects of unemployment. Earlier re-employment may have greater health benefits.	Weight of evidence for causation, but selection effects also occur. Only 2 studies found evidence suggestive of selection effects. Argues that selective and causative processes work ‘synergistically to shape people’s employment and health trajectories over time’ (p547).	Of note, no studies examining the effectiveness of policy interventions were identified.
Murphy and Athanasou (1999) Effect of unemployment on mental health	Meta-analysis* Review of studies published 1986-1996 in English language using longitudinal design and with standardized psychological tests as a dependent variable	Depression (e.g. Beck Depression scale) General psychiatric morbidity (e.g. GHQ)	7 (on transition from unemployment to employment)	The included studies suggest that moves into employment have a positive effect on mental health (d=0.54)	Equivocal. Discussion focuses on studies which make attempt to adjust for health selection effects.	Evidence presented is relatively weak when compared with other reviews on this topic.

Review and short title	Review type and quality	Health outcomes	Number of studies included	Key findings	Evidence for causation or selection?	Features
	***Good					
	** Fair					
	* Acceptable but avoidable limitations					
	°Narrative review					
Reviews examining variation within the employed population and health effects of movements into employment						
Waddell and Burton (2006) – Is work good for health?	Evidence review* Commissioned by the UK Department for Work and Pensions to inform a strategy document. Described as a best evidence synthesis, but limited information on the search strategy used e.g. the number of papers selected.	General morbidity All-cause mortality Mental health and psychiatric morbidity	53	Re-employment is associated with improved health in all groups. Unsuccessful attempts to gain work can have further negative effects on mental health	Evidence for both selection and causation. The authors suggest that the positive relationship between unemployment and health is partly selection, but also causal.	Includes information from policy papers as well as academic literature, and therefore some of the evidence statements appear to reflect consensus opinions.
van der Noordt et al. (2014) – Health effect of employment: prospective studies	Systematic review*** Only included studies examining the longitudinal relationship between employment and health the health effects of movements from unemployment to paid employment	Four categories of health outcome: Mental health Physical health General health Mortality	33 (23 high-quality studies)	Employment has positive effects on depression (OR=0.52; 95% CI 0.33 to 0.83) and psychological distress (OR=0.79; 95% CI 0.72 to 0.86). Results for other health measures were equivocal.	Not considered. Suggests that the bi-directional relationship between work and health is a caveat in interpreting the findings of their review.	Authors note that their findings are more tentative than (Waddell and Burton, 2006), possibly due to more rigorous methods used, including the focus on longitudinal studies.

2.3. Informal work and health

A consideration of informal work, in addition to labour market position, sheds more light on the role of work as a determinant of health. Although paid employment is related to better health in general, the research literature suggests that paid employment is a stronger health determinant for men than for women (Hunt and Annandale, 1993, Chandola et al., 2004, Roelfs et al., 2011). Among women, domestic conditions are somewhat more relevant for health, or at least domestic conditions and paid employment are equally important determinants of health (Bartley et al., 1992). The literature on the health effects of informal work and health has generally been motivated to better understand the determinants of women's health and has tended to consider informal work alongside paid employment. Domestic work has also been highlighted as an essential health determinant among women that warrants more rigorous research and conceptualisation (Thomas, 1995). This section considers four interconnected streams of research on informal work and health on the effects of: multiple social roles; the influence of domestic work; informal care giving; and total work roles in time use studies.

Multiple social roles and health

The quality and combination of work roles that individuals take on may have consequences for their health. As women began to participate in the labour market in increasing numbers in the 1960s, literature on multiple roles arose from concerns about women's ability to combine domestic and employment roles and the potential for mothers' employment to have negative effects for children. Two competing theoretical models describe the impact of multiple social roles on health. According to role strain theory (Goode, 1960), multiple roles have a detrimental impact on health because they cause role stress and role conflict. In other words, the adoption of multiple roles places limits on the time available for the fulfilment of specific roles, which causes stress and impacts on psychological and physical health. In contrast, role enhancement theory (Sieber, 1974) postulates that multiple roles have a positive effect on health because

human beings capacity for socially meaningful activity is expandable. Concern with concepts of work or labour is arguably less explicit in these perspectives.

There is increasing support for role enhancement theory (McMunn et al., 2006, Tamakoshi et al., 2013, Lahelma et al., 2002, Hibbard and Pope, 1993, Janzen and Muhajarine, 2003) though some earlier studies also have findings that support role strain theory (Bartley et al., 1992, Arber et al., 1985) and one Finnish study finds that neither model is particularly useful for examining role combinations and mortality risk (Martikainen, 1995). One complexity in providing conclusive evidence for one theory or another is that part time and full time employment appear to impact differently on women's health. For example, Bartley et al. (1992) found that full time employment and parenting were associated with poorer health, indicative of role strain, whereas part time employment was associated with better health, indicative of role enhancement. Differences in the way in which multiple roles are operationalised in studies may be another source of mixed findings. More recent research in Britain has made the attempt to integrate theories of role strain and role enhancement and has moved away from examining the number of roles, to understanding the quality and intensity of roles, and how these might impact on health. Nevertheless, existing characterisation of domestic and paid work activities may be inadequate for understanding their relationship with health (Artazcoz et al., 2007).

Studies examining the health consequences of multiple social roles are generally based on cross-sectional analysis (Glaser et al., 2005) which limits the capacity to generate robust conclusions about the consequences of multiple roles. Even if they do include longitudinal data, many studies of the health impact of multiple roles measure role combinations at a single point in time (McMunn et al., 2006) and earlier studies relying on a single point in time measurement of roles and health have neglected to take account of the impact of health selection in the labour market, when examining the health consequences of multiple roles (Bartley et al., 1992). While most recent studies have recognised that the impact of multiple roles may be mediated by individuals' socio-economic circumstances, consideration of the impact of women's own socio-economic

position was neglected in many studies conducted before the 1990s. Bartley et al. (1992) note that studies that do consider socio-economic position use measures that have very different meanings, which makes it difficult to understand overall findings of research in this area. Finally, in their focus on women's ability to combine employment and motherhood, earlier studies on multiple roles tended to neglect men's experiences, which means that men's experiences of non-employed roles have been less well examined (Glaser et al., 2005). As partnered women and men increasingly bargain over the distribution of formal and informal work, gender differences in the health consequences of total work responsibilities warrant attention.

Domestic work and health

Alongside research concerned with multiple social roles, some studies have looked specifically at the effects of domestic work on health, particularly with the aim of understanding the drivers of gender inequalities in health. For example Bird and Fremont (1991) found that longer time spent on housework was associated with poorer self-rated health, and argue that the longer hours that women spend on domestic work is likely to contribute to gender differences in subjective health. On the whole, studies tend to find no association between the amount of time spent on domestic work in a week and various measures of health including self-rated health (Molarius et al., 2014) wellbeing (Hagqvist et al., 2012) and sickness absence from employment (Väänänen et al., 2005). Rather, the nature of domestic conditions or perceptions about the burden of work appear to be more important factors for a range of health outcomes including coronary heart disease (Chandola et al., 2004), reported symptoms (Hunt and Annandale, 1993), psychological distress (Harryson et al., 2012) and wellbeing (Hagqvist et al., 2012).

Men and women may also experience psychosocial conditions at workplaces and in the home differently and perceptions of employment conditions appear to be more important predictors of health for men than for women (Chandola et al., 2004, Håkansson and Ahlborg, 2010, Staland-Nyman et al., 2008). In a study, based on the

Whitehall II cohort of civil servants, Chandola et al. (2004) found that poor psychosocial domestic conditions were associated with coronary heart disease among women, but not among men. Psychosocial conditions were measured using a single question on perceived control at home. Among women, poor physical and mental health, children resident in the household, caring for an older relative, and more disadvantaged social positions were associated with reporting low control at home. Some of these factors (poor physical health, presence of children) were also related to perceptions of low control at home among men but employment related factors, such as being employed in more junior grade occupations, appeared to be more important for men's sense of control at home. Such findings on the links between the psychosocial context and health appear to be sensitive to the variables used. For example when using Malaise Symptom Scores and Physical Symptom Scores as a health outcome, Hunt and Annandale (1993) found:

'... striking differences in the domestic work and in the self-reported conditions of paid work of men and women in the sample, but as much similarity as diversity in psycho-social context of paid work across gender. When associations with symptoms of malaise are explored, several aspects of paid work do not appear to be gender specific. Thus, anxiety about paid work, challenge of paid work, and physical conditions show similar associations with health for men and women, as do the 'effects' of work-related 'conflict.'

Nonetheless, there is some indication that perceptions about the demands of different forms of work differ by gender and so have consequences for differences in morbidity between men and women (Staland-Nyman et al., 2008).

Informal care giving and health

The health of caregivers, is an important consideration in the policy response to the care needs of an ageing population particularly if the experience of care giving increases the likelihood of the carer developing health problems and needing health care themselves. Cross-sectional studies have found that informal caring is associated with psychiatric morbidity, (Hirst, 2002, Singleton et al., 2002) but to begin to address the question of the causal effect of caring on health, longitudinal data are required. The key

British longitudinal study of the effect of psychological health on caring found some evidence for an increased risk of psychiatric morbidity around the time of the onset of caring and towards the end of caring relationships (Hirst, 2005). However, despite evidence that caring may have deleterious psychological effects, we should not overlook the potential for the experience of caring to be life enhancing. Considering caring from the perspective that it is a socially productive activity raises the idea that it may be positively associated with wellbeing, particularly if the quality of the caring relationship means that people achieve a balance between what they invest in activity, and what they receive in return (Wahrendorf et al., 2006). In fact, in a study on the relationship between socially productive activity and the wellbeing of over 50s, Wahrendorf et al. (2006) found that there was no significant relationship between caring and wellbeing when it was felt there was reciprocity between the person giving care and the person being cared for. However, there was a negative impact on wellbeing where the caring relationship was viewed as non-reciprocal.

Evidence on the physical health of carers appears to be equivocal and sensitive to the health measure used. Two studies on the mortality of carers illustrate this point. On the one hand, in a large-scale representative study of the Northern Irish population (1.14 million people at the 2001 Census) O'Reilly et al. (2008) found that adult carers had a lower risk of mortality in the four years following the 2001 Census compared with non-carers, although their mortality risk increased with the amount of time spent caring in a typical week. On the other hand, an American study of the mortality of carers, including more information about the quality of caring relationships but based on a relatively small sample found that carers who reported strain had a raised relative risk of mortality but there was no significantly raised risk of mortality for other carers (Schulz and Beach, 1999). Detailed studies are needed to understand causal pathways between caring and mortality and understand potential differences among carers.

Evidence on the relationship between informal caring and health would also benefit from more long-term longitudinal studies to clarify inconsistencies in findings among studies based on subjective health measures and understand the influence of

health selection into a care-giving role. For example, O'Reilly et al. (2008) found that carers were more likely to report poor general health, at the 2001 Census, but less likely to report that they had a limiting long-standing illness. They suggest that this inconsistency may be because self-reported general health is considered to be a broad measure, including a component of psychological health, which has already been shown to be negatively associated with caring in cross-sectional studies. In addition, they suggest that individuals with disabilities or limiting health conditions (measured by a Census question on limiting long-term illness) may be more likely to be selected out of the caring role; in other words that carers are selected for good physical health. In contrast, other studies suggest that carers are selected for poor health measured for example by self-reported disability (Heitmueller and Inglis, 2007). Carers who leave employment have also been found to be selected for poor health measured as the number of self-reported health conditions (Berecki-Gisolf et al., 2008). Likewise a study which examined the effect of caring on subsequent health, found that caring was associated with higher functional ability among men aged 55-64; poor general health among women; but there was no effect for either men or women in likelihood of reporting of disability (Glaser et al., 2005). Thus, where cross-sectional studies find higher rates of health problems among carers it is unclear whether this is due to conditions developed during the course of a caring relationship or because of health selection effects.

2.4. Total work and health

Studies with time use variables enable investigation of the total hours of all forms of work that individuals undertake and relationships with health. Studies are principally of participants in the United States and selected countries in Europe where time use data have been collected including Sweden, Germany, the Netherlands and Spain (for example, Bird and Fremont, 1991, Krantz et al., 2005, Hagqvist et al., 2012, Gjerdingen et al., 2000, Gimenez-Nadal and Molina, 2015). In a few studies, economists have aimed to explore the effect of health status on time use. As might be expected these studies

suggest that better health is related to longer time spent on paid employment (Podor and Halliday, 2012, Gimenez-Nadal and Molina, 2015). However they have mixed findings where non-market work is concerned. One American study suggests that better health is associated with longer time spent on domestic labour (Podor and Halliday, 2012) and two studies find the opposite: one multinational study of Europe (Gimenez-Nadal and Molina, 2015) and one Spanish study (Gimenez-Nadal and Ortega-Lapiedra, 2013). Nonetheless this type of research indicates the potential for health selection into both formal labour market and domestic labour positions.

Much research exploring the health effects of work is motivated by concern with work to family conflict and the boundaries between paid employment and domestic life. As we have seen in previous sections, however, the way people feel about the different aspects of their life - the quality of employment and domestic roles - is likely to be a more important determinant of health than simply the time spent on particular roles or the number of roles occupied. The remainder of this section therefore focuses on considering studies that further illustrate the potential pathways between total work and health.

Time use studies of total work and health indicate the gendered nature of time use, with men spending more time on paid employment, and women longer hours occupied with housework and caring for children. However these gender differences in the allocation of work activities do not directly manifest in health differences between men and women - the mechanisms are more complex. Using data from the European Social Survey, Hagqvist et al. (2012) examined the relationship between wellbeing and time spent on paid employment and housework in a cross-sectional study. They found that perceptions of work demands were more important predictors of wellbeing than actual total hours of work. To examine the effect of total work on health symptoms Krantz et al. (2005) looked at hours spent on different forms of work as well as individual's evaluations of their work conditions. For women, particularly long hours spent on both paid employment (50 or more hours per week) and childcare (20 or more hours per week) suggested high levels of symptoms. Nevertheless, consistent with the findings of

the majority of studies on multiple social roles, they found limited evidence of conflict between employment and family being associated with ill health. Overall, neither the total number of hours spent on all forms of work (less than 82 hours per week or more than 82 hours per week) nor reported work-family conflicts were associated with health symptoms. However perceptions of total workload and employment stress were related to high levels of health symptoms for both men and women, though this study looked only at highly educated white-collar employees. These studies therefore indicate the importance of subjective psychosocial evaluations of work demands as influences on health. As Bird and Fremont (1991) suggest we cannot assume that time spent performing particular roles is equally desirable for all individuals. They also identify the combination of higher wages and education levels among men in general compared with women as potential explanatory factors that also affect gender differences in the relationship between work and health that are apparent. Viewed in another light, the repeated finding that perceptions of work demands are central in shaping health, reinforces the emphasis that sociologists give to the relational nature of labour – the connections between the social environment within which work is undertaken and the agency of workers.

2.5. Summary and conclusion

The chapter has been concerned with exploring what is known about the influence of work, broadly conceived, on health. Much evidence related to the issue of the influence of work on health is concerned with the formal labour market, unemployment and health. There is mounting evidence from review level studies suggesting that unemployment and precarious labour market positions have a significant detrimental effect on a range of health outcomes including mortality, and that the relationships are predominately causal. These relationships are persistent over time and across nations, but less pronounced for women and older people of working ages. At the same time, health selection into particular labour market positions also exists and partly explains the association between unemployment and health. Consistent indications of both health

selection and causal effects at play indicate the theoretical importance of considering experiences over the life course in such relationships. There is growing interest in examining temporal issues and the precise causal pathways between labour market position and health. This approach is likely to be fruitful for better understanding the relationship between informal caring and health, where there are paradoxical findings of lower mortality among informal carers and inconsistencies depending on health measures used. Such evidence as exists on the relationship between different forms of informal work and health is more equivocal than for formal labour market position and sensitive to health outcomes used in studies. Research on informal work and health has often focused solely on women using cross-sectional data. It nonetheless indicates that there are gender differences in labour and psychosocial experiences of work – the way men and women feel about employment activity, domestic work and other aspects of work are different, with different health consequences.

3. Multiple views on work and health: aims and methods

Investigations of the relationship between work and health are best undertaken with longitudinal data to enable exploration of potential causal pathways. This chapter sets out the aims of the study, research questions to be addressed in light of the research literature discussed in Chapter 2, and the principal features of the methods and materials used. The study is intended to investigate the relative importance of formal employment versus informal work as health determinants. Key concerns are to better understand gender differences in the relationship between health and work, and to identify groups that may warrant policy intervention. The investigations reported are based on secondary analysis of data from two complementary data sources, the ONS Longitudinal Study (ONS-LS) of England and Wales and the British Household Panel Survey (BHPS). The studies are complementary and provide rich data for examining life course work positions and health outcomes.

3.1. Research questions, aims and objectives

Trends in labour market position and health

Research question 1: How does labour market position around State Pension age affect subsequent health? Does the effect vary over time, by cohort, gender and health outcome?

In Chapter 2, the consideration of review-level studies on labour market position and health showed that there is a preponderance of evidence that examines the relationship between unemployment and health and much less concern, in health studies, with other non-employed positions among working age people such as permanent sickness or looking after the home or family. The first aim of this study is therefore to investigate relationships between formal labour market position and health around State Pension age. The research objectives are to:

- Examine trends in the relationship between cross-sectional indicators of labour market position and subsequent mortality using the ONS Longitudinal Study
- Investigate whether certain non-employed positions are particularly deleterious for health
- Identify whether relationships are consistent when limiting long-term illness is considered as a health outcome

Hypotheses

Several hypotheses can be drawn from the contextual information and research literature described in Chapters 1 and 2. It might be anticipated that:

1. *Housewives have an increased risk of poor health and mortality compared with employed women.* In the previous chapter we saw that domestic work is related to poor self-rated health and differences in domestic workloads are likely to be a contributory factor in gender inequalities in subjective health.
2. *Non-employed men have an excess risk of death relative to those in employment, especially unemployed and permanently sick men.* Review levels studies described in Chapter 2 provided clear evidence of the consistent health advantage of employed people compared with other groups. The deleterious effects of unemployment are now well evidenced. Permanently sick people would by nature of their sick role be expected to also have relatively high mortality rates.
3. *The mortality of permanently sick people will improve over time relative to people in employment.* As was described in Chapter 1, policy changes resulted in a dramatic growth in the number of people signed onto sickness benefits rather than unemployment benefits from the 1980s until numbers peaked in 2003. While permanent sickness logically implies poor health, as the numbers grew it might be expected that such people would be less seriously ill than was previously the case, and therefore lower average mortality rates would be seen in the group relative to employed people.
4. *Around the time of recession, the mortality of unemployed people will be lower than at*

other periods. We saw in Chapter 2 that job loss is more likely for all groups in times of recession. This might be expected to reduce the degree to which unemployed people are a socially select group in recessionary periods. Therefore we can expect that the relative mortality risk of unemployed people would be lower in the two recessionary periods included in this study – 1981 and 1991.

Labour market trajectories and health

Research question 2: How are different trajectories of labour market position associated with health in later life? Do associations vary by gender and health outcome?

The temporal sequence of events is important for understanding the relationship between labour market position and health. Evidence shows that disadvantaged labour market positions accumulate over time and are associated with chronic illness (Bartley and Plewis, 2002). Therefore, in addition to investigations based on cross-sectional measures of labour market position, trajectories will also be examined. The research objectives are to:

- Describe trajectories of labour market positions in mid life to early old age in the BHPS using appropriate empirical methods
- Determine associations of labour market trajectories with subsequent mortality, self-rated health and psychiatric morbidity by gender
- Identify those labour market histories that confer relative health advantage or disadvantage

Hypotheses

1. *Men and women who experience labour market trajectories that are mainly employment-based will have better health across health indicators.* Evidence based on cross-sectional measures of labour market position consistently shows that employed people have the best health. It follows that people with accumulated employment roles will have the best health of all.

2. *Exposure to the permanent sick role will be more long lasting than other non-employment roles and associated with the greatest health risk of all.* Policy research studies show that many people signed onto sickness benefits in the two decades up to 2008, were arguably ‘written off’ to remain in the sick role until retirement. By contrast those on unemployment benefit are required to actively seek work. It might be anticipated that accumulated exposure to the permanent sickness will have a detrimental effect on health (over and above any pre-existing illness) as people are deprived of the health benefits associated with employment that have been discussed.

Domestic work, labour market position and health

Research question 3: What is the relationship between domestic work and health and how does it vary by labour market position? To what degree do differences in individual perceptions of workloads underpin such relationships?

Research literature on multiple social roles and health has identified that considering the number of different social roles than an individual undertakes may be less informative than considering the quality of roles. Perceived reciprocity (Wahrendorf et al., 2006), and the degree of choice or constraint over a role may be more important than the combination of informal work roles that an individual undertakes. The third aim of the study is therefore to determine whether any variations in the association between domestic work and health by labour market position are related to differences in perceptions of housework allocations. The research objectives are to:

- Describe patterns of housework in mid life by gender using the BHPS
- Determine the strength of association between domestic work and health
- Examine whether the relationship between domestic work and health varies by labour market position and with perceptions about the fairness of domestic work allocations

Hypothesis

1. *Perceptions of housework workload are stronger predictors of health than the amount of hours spent on household.* Research tends to demonstrate that how people feel about their position is a more important influence on health than the number of hours work they undertake.

Informal care giving, paid employment and health

Research question 4: Is the combination of informal caring and paid employment detrimental for health?

We have seen that where cross-sectional studies find higher rates of health problems among carers it is unclear whether this is due to conditions developed during the course of a caring relationship or because of health selection effects. Paradoxically, research has shown that informal carers report poorer health but may have a lower risk of mortality– that while a degree of physical fitness is required to initiate and maintain a caring role, this may not be the case in terms of psychological health. As people approaching retirement are increasingly called on to care for older relatives, will this be detrimental if they also have to hold down a paid job? The research objectives for this aspect of the study are therefore to:

- Describe the distribution of combinations of informal caring and labour market position at ages 50-64
- Investigate health selection into combinations of caring status and labour market role
- Examine the health sequelae of these combinations, taking account of any health selection

Hypotheses

1. *Informal care-givers are a socially select group, more likely to be those who were not previously in employment and who reported worse health.* Cross-sectionally carers are more likely to report poor general health. It is anticipated that this is in part due to people with poor health being more likely to take up caring roles.

2. *While the overall mortality of carers will be lower this effect will be more pronounced among people who combine paid employment and care giving.* If we assume that combining employment and care giving requires a certain degree of fitness and resilience, that people in employment have better health than those in other labour market positions, and that human capacity to combine roles is expandable, it might be expected that people who combine paid employment and informal caring will have lower mortality compared with those in other labour market positions who provide informal care such as housewives.

3.2. Materials and methods

The research undertaken to address the aims and research questions discussed was undertaken using two large-scale data sources, each with respective strengths and limitations. This section describes the key features of the two studies – the ONS Longitudinal Study and British Household Panel Survey. More detail about the studies is provided in the context of specific analysis in later chapters.

The ONS Longitudinal Study (ONS-LS)

The ONS-LS is a record linkage study of a one per cent sample of the population of England and Wales, which was started at the time of the 1971 census, (Hattersley and Creeser, 1995). At the time of writing, the study included linked records from each decennial census, 1971-2001, and information from the 2011 census has recently been added. Samples are selected from the census and records matched and linked over time. Along with census information, the ONS-LS links information on registered events occurring to study members such as births, deaths, immigrations and emigrations. Information on other people living with the study members at each census is also included in the ONS-LS, although such information is not linked over time. Researchers may apply to use the data, and ONS provides approved researchers with access to the data for secondary analysis within a microdata laboratory. A key strength of the ONS-LS lies in its unusually large sample (around 500,000 people at each census), which enables robust analysis with statistical precision. Another asset of the study is the length of

historical coverage as the data span four decades. On the other hand, compared with other large-scale longitudinal studies, the variables available in the ONS-LS are more limited in range and frequency because of lengthy measurement intervals between censuses. Nonetheless, with careful design, studies can exploit the power of ONS-LS and generate findings of substantive interest and relevance for policy (Office for National Statistics, 1999).

The samples selected from this study are people who were aged 50 to 64 years at each Census 1971-2001. Sex and date of birth discrepancies may occur between linked records on the same individuals generally in fewer than one per cent of cases (Hattersley and Creeser, 1995). Discrepancies were investigated, as they could affect mortality estimates and the data were cleaned to ensure that reports of sex or age that appeared to be erroneous in a particular record were replaced with the information held in other records. The sample is restricted to people who were traced in the NHS Central Register at the time of the Census. The NHS Central Register was the main system used for record linkage in the study until recently. For those not traced, exits from the study between censuses are less likely to be recorded which could generate biases in the population at risk when analysing mortality. At each Census the sample included around 75,000 people.

Measures in the ONS Longitudinal Study

Labour market position

At the Census, individuals reported their labour market position with options to report whether they were in full or part time employment or self-employment, unemployed, or not in employment because they were retired, permanently sick or looking after the home or family. Relatively few men are engaged in part time employment and very few people are self-employed so those in paid work are generally treated as a single category for pragmatic purposes to support analyses with health outcomes that require statistical power. Those not in paid employment are categorised to one of four groups: unemployed, retired, permanently sick and others economically inactive, including those looking after the home or family.

Informal care giving

The 2001 Census included a question on provision of unpaid care but information on informal caring was not collected in prior Censuses. The question asked: *“Do you look after, or give any help or support to family members, friends, neighbours or others because of: long-term physical or mental ill-health or disability, or problems related to old age?”*

Respondents were directed not to count anything that they did as part of their paid employment. The response options were: none (no care giving); 1-19 hours; 20-49 hours and 50+ hours. This measure gives a broad indication of the amount of time an individual spends providing informal care in a typical week (Deacon, 2000) but there is no other direct information about study members' care provision or care receipt.

Indicators of morbidity

Two indicators of subjective morbidity are collected at the Census: limiting long-term illness (LLTI) and self-rated general health. The question on limiting long-term illness was first asked in the 1991 Census: *Do you have any long-term illness, health problem or handicap which limits your daily activities or the work you can do? Include problems which are due to old age.* The question was repeated in 2001 with a revised wording which asked: *“Do you have any long-term illness, health problem or disability which limits your daily activities or the amount of work you can do?”* The self-rated health question was new in the 2001 Census and asked people *“Over the last 12 months, would you say your health has been good, fairly good or not good? Do not include problems which are due to old age.”*

Mortality

The final health measure used in this study is mortality. Mortality is examined in the decades following each census based on data on death registrations that are linked to the study. In the sample, individuals who emigrated were removed from the population at risk permanently for the remainder of the decade under investigation.

Social position

To adjust for socio-economic differences between groups, the Registrar General's social class based on occupation was used aggregated into social classes I-IIIN (non-

manual) and IIM-V (manual), as this is the only measure of socio-economic position that stretches back to the 1971 Census. Housing tenure was also used to make up for the deficiencies of social class as an indicator of socio-economic position among people who have been out of work for some time and women in general.

The British Household Panel Survey (BHPS)

The British Household Panel Survey is a representative survey of private households in Britain, which enables analysis of social, economic and demographic change over a period from 1991 to 2008 across 18 annual waves of data collection. The data are made available by the UK Data Archive for academic researchers to use free of charge. The BHPS is a particularly useful study because it follows a large sample of the same individuals annually and collects information on a rich variety of issues including a core module of questions and rotating or unique modules in specific years.

The wave 1 sample comprised 5,500 households and more than 10,000 individuals. The sample was selected using a stratified cluster design with approximately 8,167 households initially selected from the Postcode Address File (PAF). All adult members of selected households, aged 16 and over, were eligible to be interviewed annually for the study. Research interviewers collected data in earlier waves using pen-and paper (PAPI) data collection. In wave 9, Computer Assisted Personal Interview (CAPI) data collection was used.

The sample consists of Original Sample Members (OSMs) who were initially enumerated in households selected for the panel, and Temporary Sample Members (TSMs) who were not initially selected for the study but resided with an OSM at some point. TSMs are only followed-up during the period they live with the OSM. The sample at wave 1 was initially selected to cover Great Britain (England, Wales and Scotland) and new samples were incorporated to extend the Scotland and Wales samples in wave 9, and add coverage of Northern Ireland in wave 11.

To create samples with sufficient statistical power, the samples selected for analysis focused on people aged 44 to 65 at each wave. This approach generally yields

samples of approximately 2,000 people in a period after cases with missing data are excluded. More details on the selected samples are provided in subsequent chapters in relation to the analyses reported.

Measures in the BHPS

Labour market position

Information from the variable on current economic activity in the BHPS (*wJBSTAT*) was used as the basis for an indicator of labour market position that was consistent with the ONS-LS. This enabled categories of: employed, unemployed, permanently sick, retired, looking after the home or family and other inactive to be identified.

Informal work

The BHPS asks respondents whether they provide informal care for other household members or residents, and if so the number of hours spent caring per week. This information was classified as follows in the present study for comparability with the ONS-LS: 1-19 hours, 20-49 hours and 50+ hours. Additional information is available on the hours per week spent on housework (*wHOWLNG*) and who in the household is mainly responsible for childcare (*wHUSITS*). Perceptions about informal work were measured in questions about fairness of housework allocations (*wFAIR1*) and childcare arrangements (*wFAIR2*) at waves 2 and 7. However, information on hours spent on childcare not usable as only a minority of the selected sample were asked the question.

Limiting illness

Information on limiting illness was collected with the question, *Does your health in any way limit your daily activities compared to most people of your age?* (*wHLLT*) which is slightly different from the Census question on limiting illness which is available in the ONS-LS. This question was asked at all but two waves (wave 9 and wave 14).

GHQ-12

The 12-item General Health Questionnaire (Goldberg, 1978) is a widely used screening tool for minor psychiatric morbidity, which was administered to respondents at all 18 waves of the BHPS via a self-completion question. The questionnaire asks people to rate how they have been feeling over the last few weeks, for example with

phrases like *'Have you recently been able to concentrate on whatever you're doing?'* with responses options on a scale of frequency, normally 'not at all', 'no more than usual', 'rather more than usual' and 'much more than usual'. The responses to the set of items were used to create a binary indicator of caseness. With this approach, the response to each item is scored 1 if it indicates some symptoms, for example, where the symptoms occur rather or much more than usual. Scores are summed across the 12 items with a range from 0 to 12. A cut point of 4 or more is used to indicate psychiatric morbidity.

Statistical analyses

The vast majority of analyses were performed using Stata. Associations between work positions and limiting long-term illness of psychiatric morbidity were generally investigated using logistic regression models. Cox proportional hazards models, are used to examine mortality and to consider risks of incident limiting long-term illness or psychiatric morbidity. BHPS analysis was performed using the .xt of commands for panel data, which enable within and between person variations to be examined.

Analyses are generally performed separately for men and women, where sample sizes allow. Models on mortality include adjustments for factors expected to modify the relationship and where possible, adjustments are made to consider health selection effects. Longitudinal labour market histories in the BHPS were explored using latent class mixture models in MPlus, which enabled individuals to be classified into one of a number of classes based on the trajectories of labour market position in the dataset. This approach, along with the results is described in more detail in Chapter five.

3.3. Scope and originality

Given the extensive literature reviewed in the previous chapter, it clear that this study is not unique in its aim to investigate the health effects of work. Rather, claims to originality lie in new analysis of the ONS-LS and BHPS, and the methodological approaches used such as latent class analysis, and the particular period of the life course that this focus for considering health and work. Much research on employment and health among older people is particularly concerned with the transition to retirement.

Studies considering the interplay of paid work, family and health have tended to focus on earlier years of adult lives occupied by child bearing and child rearing. The focus on historical trends in mortality by labour market position at older ages has not previously been undertaken with the ONS-LS. The ONS-LS is noted as an important source of data for examining socio-demographic mortality differentials (Blackwell et al., 2005) I aim to exploit this rich data source focusing on a period of the life course that is arguably under-researched in relation to work. Likewise domestic work, employment and health have not been operationalised together in the BHPS. The value of combined analysis of the BHPS and ONS-LS has been advocated to help contextualise results (Office for National Statistics, 1999). This is one of only a few studies that have attempted to integrate analysis of the BHPS and ONS-LS (e.g. Brimblecombe et al., 1999, Brynin et al., 2008, Platt, 2009).

4. Trends in labour market position and health in later life

Research shows that at older ages, structural and cyclical changes in the economy are likely to have a significant bearing on the relationship between labour market position and health (Beatty and Fothergill, 2005). Recent economic changes and policy drivers to keep people in employment for longer therefore raise more focused consideration of whether this policy goal is beneficial for the health and wealth of the nation. This chapter focuses on a particular period of the life course – the period around the State Pension age, and examines the relationship between labour market position, and subsequent mortality and morbidity in England and Wales using longitudinal data for the period 1971-2006. It addresses the following questions: How does labour market position around State Pension age affect subsequent health? Do the effects vary over time, by cohort, gender and health outcome?

4.1. Method

The Office for National Statistics Longitudinal Study (ONS-LS) is the source of data used in this chapter. Data from each Decennial Census 1971 to 2001 inclusive are used along with death registrations up to the end of 2006. As the ONS Longitudinal Study includes data from the Decennial Censuses from 1971-2001, it allows historical changes in relationships to be examined. The sample selected comprises people within ten years of the UK State Pension age (SPA) at each census, which was 60 for women and 65 for men. Specifically, women aged 50-59 years and men aged 55-64 years were selected. These sub-samples represent four distinct birth cohorts. The health of people immediately post-SPA is also examined by including men aged 65-69 and women aged 60-64 years.

Measures

Health outcomes

Mortality is the primary health outcome examined. Analysis of mortality is based on follow-up of each census cohort for five years, taking into account any known exits from the population at risk due to emigration from England and Wales. The sample used is limited to study members who were traced in the NHS Central Register – more than 97 cent per cent of the eligible sample at each census. Information on morbidity comes from the census question on limiting long-term illness, which was collected in the 1991 and 2001 censuses.

Explanatory variables

Labour market position is the primary explanatory variables comprising five groups that are consistent over time and allow sufficient sample sizes for analysis: in employment; unemployed; retired; permanently sick; other inactive. Socio-economic differences between the labour market positions are adjusted for using the Registrar General social classes, aggregated into social classes I-IIIN (non-manual) and IIIM-V (manual). In the 2001 Census, the National Statistics Socio-economic Classification (NS-SEC) replaced the Registrar General's classification as the official measure of social class. It is possible to allocate study members to an approximation of NS-SEC at the 1991 Census, but this is not currently an option at earlier Censuses. Therefore, for the 2001 cohort I have used an approximation to Registrar General non-manual and manual social classes, to allow consistency with earlier Censuses. Women were assigned a social class according to the occupation of the head of their household; this is typically the woman's own occupation for never married, divorced and widowed women and the spouse's occupation for married women.

Statistical analysis

For each census cohort, labour market position recorded at the census is related to subsequent health. To examine differences in mortality between groups, age-specific mortality rates were calculated by labour market position for each census cohort. This

also enabled analysis by birth cohorts as follows. For women three birth cohorts were examined at ages 50-54 and 60-64: women born 1917-1921, 1927-1931 and 1937-1941. For men, three distinct birth cohorts – born 1912-1916, 1922-1926 and 1932-1936– were examined at ages 55-59 and 65-69. Relative differences in mortality are examined using Standardised Mortality Ratios (SMRs). For each cohort, the gender-specific death rates used for standardisation of SMRs are those of people in employment. Logistic regression models were used to estimate the odds of limiting long-term illness at a subsequent census adjusted for social class. This was possible for the 1981 and 1991 Census cohorts, relating labour market position then to limiting long-term illness at the following census, as data on limiting long-term illness were only available in 1991 and 2001. Statistically significant differences between groups are determined by observing non-overlapping confidence intervals.

To investigate possible selection bias into the different labour market positions, deaths in the first five years after each census were ignored and only deaths during the post-census years 6-10 were included in sensitivity analyses. Allowing in this way for wearing off of selection (Moser et al., 1987) accounts for the possibility that ill people are more likely to enter certain labour market positions, which increases confidence in the mortality differentials identified. As the ONS-LS's most recent mortality linkage was 2006 at the time of writing, it was not possible to use this method for the 2001 Census.

4.2. Trends in the distribution of labour market position

Since 1971 there has been substantial change in distribution of labour market position around the State Pension age. Table 4.1 shows a pattern of increasingly early labour market withdrawal. For example, the proportion of men in work at ages 60-64 years has fallen markedly, from 78.4 per cent in 1971 to 47.5 per cent in 2001. Correspondingly, the proportion of men retired at ages 60-64 rose from 7.2 per cent in 1971 to 24.7 per cent in 2001, while the proportion permanently sick rose from 9.0 per cent to 19.7 per cent (Figure 4.1). Among women at the ages examined here, the other

inactive group, who mostly are housewives, decreased in size relative to other groups. Below the State Pension age, considerable reductions in the proportions recorded as other inactive coincided with large increases in the proportions in employment (Figure 4.1). After the State Pension age, by 2001, women (61.6 per cent) were almost as likely as men (78.3 per cent) to describe themselves as retired. Like men, the proportion of women who are permanently sick increased steadily in the decade of life prior to State Pension age.

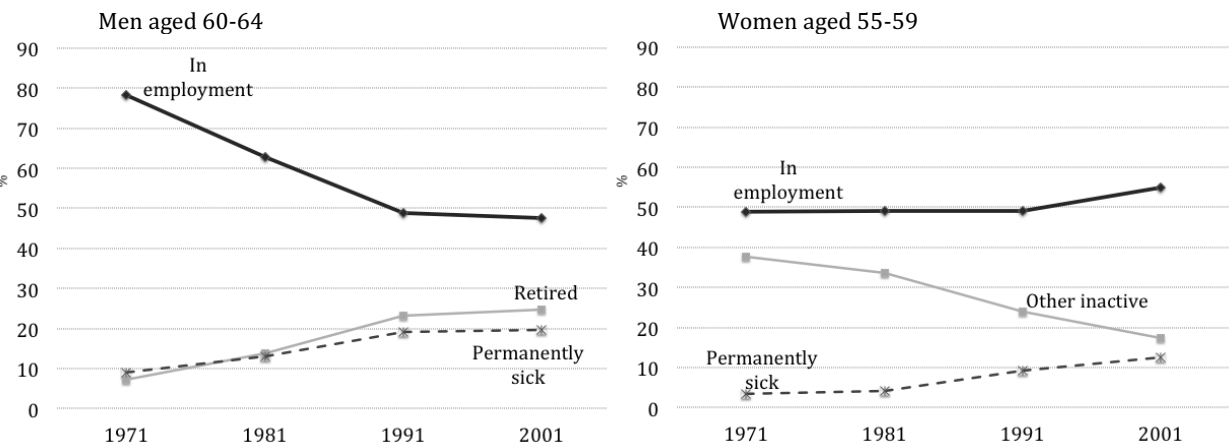
Table 4.1: Percentage distribution of labour market by age group and census

Labour market position and census	Men				Women			
	55-59	60-64	65-69	N	50-54	55-59	60-64	N
In employment								
1971	90.4	78.4	29.5	28541	56.3	48.9	27.4	21377
1981	82.2	62.7	16.9	22519	60.6	49.0	21.4	20179
1991	70.2	48.8	12.7	17958	63.2	49.2	21.9	19202
2001	70.7	47.5	13.8	19149	68.9	54.9	25.5	25681
Unemployed								
1971	3.0	5.1	0.5	1255	1.6	1.5	0.6	604
1981	7.9	10.1	0.2	2518	2.3	2.1	0.2	711
1991	8.9	8.2	0.3	2377	3.5	3.1	0.3	975
2001	3.3	3.0	0.5	980	1.9	1.5	0.4	664
Retired								
1971	1.3	7.2	68.4	8938	1.8	5.6	28.1	5629
1981	1.6	13.9	79.1	11623	0.5	2.5	20.3	3454
1991	6.3	23.2	80.6	13842	2.2	8.9	49.9	8654
2001	8.7	24.7	78.3	14147	2.6	10.2	61.6	10647
Permanently sick								
1971	5.0	9.0	1.3	2186	2.6	3.4	1.4	1189
1981	7.9	13.0	3.4	3304	3.1	4.2	2.3	1471
1991	13.8	19.0	5.9	5207	7.2	9.2	4.5	2967
2001	13.0	19.7	5.7	5392	9.3	12.4	5.7	4569
Other inactive								
1971	0.2	0.3	0.3	113	37.7	40.6	42.5	19436
1981	0.3	0.4	0.4	138	33.5	42.3	55.9	20056
1991	0.9	0.9	0.5	309	24.0	29.6	23.4	10963
2001	4.2	5.1	1.9	1577	17.3	21.1	6.8	7662

Unemployment was highest in 1981 and 1991 – both periods of economic

recession. Nevertheless unemployment was still very rare for women. For men rates of unemployment and permanent sickness were similar in 1981, but by 1991 the proportions permanently sick exceeded those unemployed despite the recession.

Figure 4.1: Trends in proportions of men aged 60-64 and women aged 55-59 in different labour market positions, 1971-2001: selected labour market positions



Source: ONS Longitudinal Study. Author’s analysis.

4.3. Mortality by labour market position

Absolute declines in mortality by age

Table 4.2 shows the relationship between labour market position and mortality using age-specific death rates. There were substantial decreases in the absolute death rates in all groups over the period 1971-2001; for example, there was a 66.1 per cent fall in the mortality rate of men in employment at ages 60-64. Retired men and women had the largest absolute reductions in mortality rate between 1971 and 2001, particularly among people who were approaching the State Pension age (around 73 per cent for men aged 60-64 and 70 per cent for women aged 55-59). Despite these sizeable reductions in absolute mortality, the pattern of relative mortality risk remained remarkably stable during 1971-2001, being persistently lowest among those in employment and highest among the permanently sick for both men and women at working ages (with a few exceptions, where confidence intervals overlap). Figure 4.2 further illustrates this point

comparing the change in rates for employed and permanently sick men and women at ages 55-59. As can be seen despite dramatic absolute declines in the mortality of permanently sick men and women by 2001, their mortality rates still exceeded the rates of those who were in employment in 1971. In effect, the health improvements seen in the permanently sick group were not fast enough to reduce their relative mortality disadvantage.

Figure 4.2: Mortality rates of employed and permanently sick men and women, aged 55-59, 1971-2011



Source: ONS Longitudinal Study. Author's analysis.

Table 4.2: Age-specific mortality rates of men and women around State Pension age, 1971-2001.
Rates per 10,000. Deaths 1-5 years after census

Sex, age group and census	Labour market position									
	In employment		Unemployed		Retired		Permanently sick		Other inactive	
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
Men										
55-59 years										
1971	181	171-191	215	162-285	408	294-565	627	546-720	427	204-896
1981	148	139-158	193	160-233	398	103-175	489	426-568	334	159-701
1991	97	89-106	139	112-172	134	69-207	295	261-333	134	67-267
2001	62	56-69	100	68-148	89	73-103	222	189-258	97	68-138
<i>Change 1971-2001</i>	-66%		-53%		-78%		-65%		-77%	
60-64 years										
1971	290	276-305	328	272-396	490	428-560	809	733-892	659	365-1189
1981	217	203-233	214	180-254	301	266-341	617	561-678	439	229-844
1991	149	136-163	188	154-229	194	173-218	424	387-463	245	145-414
2001	98	88-110	141	98-205	131	114-150	294	265-326	182	141-235
<i>Change 1971-2001</i>	-66%		-57%		-73%		-64%		-72%	
65-69 years										
1971	421	389-455	266	127-558	622	595-650	966	728-1282	531	253-1114
1981	294	262-330	198	64-614	473	452-494	899	763-1059	454	236-872
1991	243	209-281	680	354-1307	381	363-400	702	612-805	460	261-810
2001	167	140-198	112	36-346	243	229-258	591	508-688	263	180-383
<i>Change 1971-2001</i>	-60%		-58%		-61%		-39%		-51%	
Women										
50-54 years										
1971	59	52-67	79	43-147	139	89-218	226	167-305	67	58-77
1981	46	40-53	53	28-102	231	120-444	180	132-246	73	63-84
1991	25	21-30	36	19-69	102	62-166	145	115-183	38	30-49
2001	25	22-29	27	11-65	24	11-54	88	71-110	49	39-60
<i>Change 1971-2001</i>	-57%		-66%		-83%		-61%		-28%	
55-59 years										
1971	86	77-96	109	63-188	177	142-220	366	299-449	110	99-122
1981	68	61-77	94	57-156	149	103-216	324	265-395	104	94-116
1991	50	43-58	114	77-171	71	52-95	196	164-235	67	57-80
2001	37	31-43	138	85-225	54	40-73	178	153-207	56	45-68
<i>Change 1971-2001</i>	-57%		26%		-70%		-51%		-49%	
60-64 years										
1971	119	105-134	150	72-315	200	181-220	604	460-792	180	166-196
1981	100	85-117	0	0-0	185	164-209	464	365-589	161	149-174
1991	90	76-106	0	0-0	149	137-163	439	368-525	106	91-123
2001	65	54-79	0	0-0	102	93-112	390	330-461	103	77-137
<i>Change 1971-2001</i>	-45%				-49%		-35%		-43%	

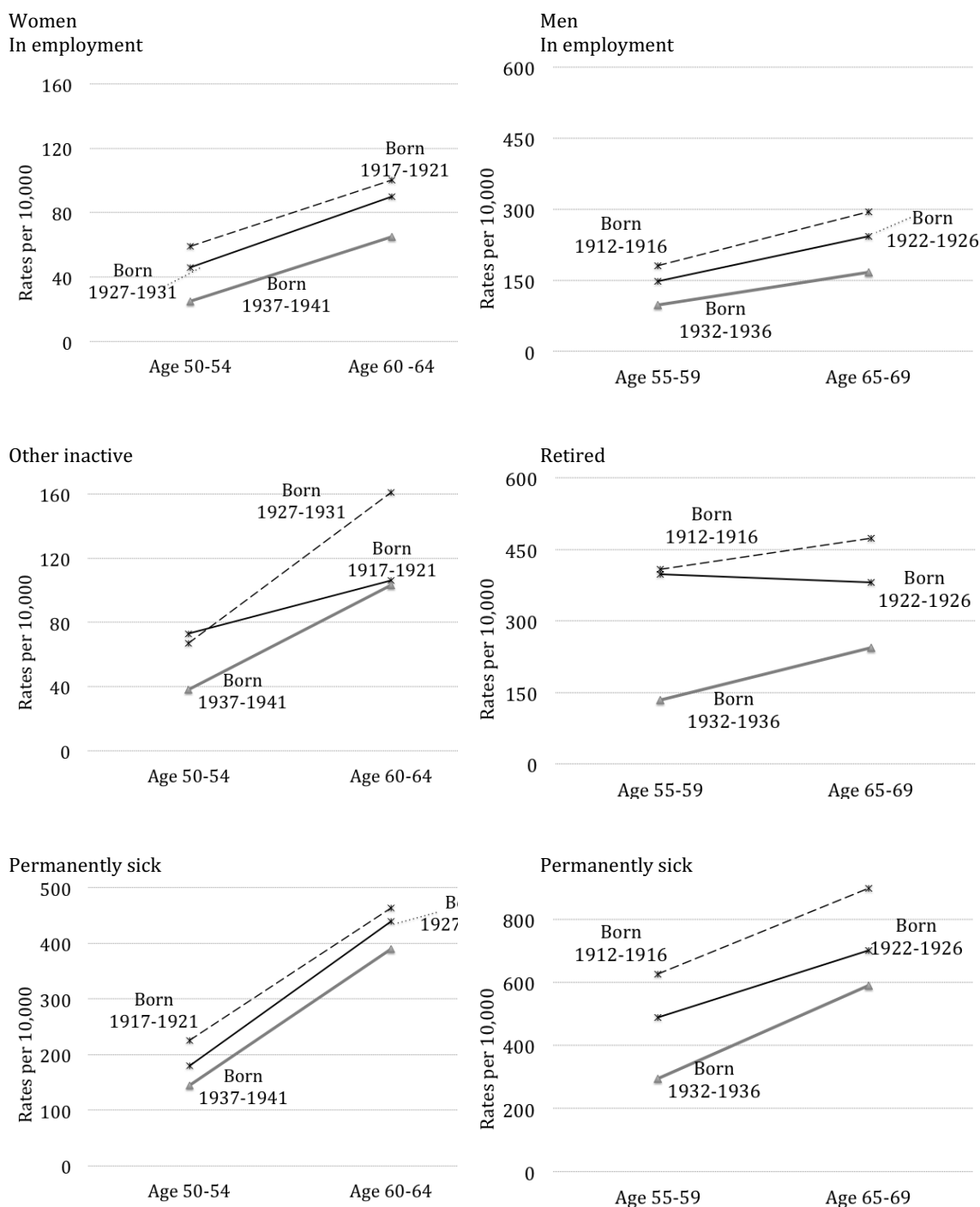
Source ONS Longitudinal Study. Author's analysis.

Changes in mortality by birth cohort

Analysis of age-specific mortality rates by birth cohort shows the pace of change in longevity over time as people aged. Such cohort change varied by labour market position and to a lesser extent, by gender. Figure 4.3 shows three distinct birth cohorts of women born 1917-1921, 1927-1931 and 1937-1941 that are included in the study, and their respective mortality rates at ages 50-54 and 60-64. For men, birth cohorts born 1912-1916, 1922-1926 and 1932-1936 are shown with mortality at ages 55-59 and 65-69.

Considering women, as would be expected, mortality rates increased as they aged. However, what is rather unexpected is the rapid pace of change in mortality risk as women aged, and the degree of variation between labour market position groups. Among employed women rapid declines in mortality were evident for successive birth cohorts. For example, when aged 60-64 the mortality rate of employed women who were born 1937-1941 was roughly the same as women born 1917-1921 experienced when they were ten years younger (at ages 50-54). A similar pattern was also observed among employed men in the cohorts shown in Figure 4.3.

This pattern however, was not seen across all labour market position groups. As can be seen mortality did not improve in a linear fashion from cohort to cohort among other inactive women. The cohort born 1927-1931, around the time of the Great Depression did not have lower mortality than the preceding cohort, born 1917-1921. Among retired men, there was a different pattern of mortality risk with age for the cohort born 1922-1926 among whom there was no change in mortality rates between ages 55-59 and 65-69. While mortality rates declined with each successive cohort of permanently sick women, they also increased sharply with age. For example, for women born 1937-1941, the mortality rates of those permanently sick increased from 145 deaths per 10,000 at ages 50-54 to 390 per 10,000 at ages 60-64 - a difference of 245 deaths; in relative terms mortality rates increased 2.69 times as the group aged ten years. Among permanently sick men, mortality also rose with age but less sharply than among permanently sick women (though, admittedly permanently sick men had the highest mortality of all groups studied).

Figure 4.3: Mortality rates by birth cohort and age: selected labour market position groups for men and women

Source: ONS Longitudinal Study. Author's analysis.

The mortality of permanently sick men born 1932-1936, increased from 295 deaths per 10,000 at ages 55-59 to 591 per 10,000 at ages 65-69 - a difference of 296 deaths. This was a smaller relative increase in mortality rates with age, than was seen for permanently sick women as they moved from their fifties into their sixties. As can be

seen therefore, the pace of change in mortality as individuals age over the life course varies by gender and labour market position as well as birth cohort.

Relative differences in mortality

Along with changes in the distribution of groups in the labour market, there was some change in the relative risk of mortality for groups falling between the lowest mortality of people in employment, and the highest of the permanently sick. Table 4.3 shows Standardised Mortality Ratios (SMRs) by labour market position for people in the ten years approaching State Pension Age. In 1971, the mortality of retired men (SMR=175) and women (SMR=211) was significantly raised compared with people in employment.

Over the period 1971-2001, large reductions in absolute mortality rates among retired people, reduced their relative mortality risk to the extent that, by 2001, only employed people had lower mortality rates than retired people. Among men, the relative mortality risk of those in the other inactive group fell also over the period, at a time when the mortality of unemployed men increased relative to those in work. Among women, the relative mortality of those other inactive or unemployed was higher by 2001 compared with earlier decades.

Table 4.3: Standardised Mortality Ratios for men aged 55-64 and women aged 50-59: 1971-2001. Deaths 1-5 years after census.

	1971	1981	1991	2001
Men aged 55-64				
In employment	100	100	100	100
Unemployed	115 (98-134)	110 (97-125)	133 (115-154)	151 (116-198)
Retired	175 (155-198)	149 (133-167)	131 (118-146)	135 (120-152)
Sick	298 (275-323)	299 (277-322)	290 (270-312)	318 (293-346)
Other inactive	230 (145-366)	212 (130-346)	153 (101-233)	174 (142-214)
Women aged 50-59				
In employment	100	100	100	100
Unemployed	130 (86-196)	129 (86-192)	197 (140-277)	236 (154-362)
Retired	211 (173-257)	252 (183-348)	171 (132-220)	138 (104-182)
Sick	411 (347-487)	446 (377-528)	445 (386-513)	432 (381-490)
Other inactive	122 (113-133)	154 (142-168)	140 (122-160)	168 (145-195)

Source: ONS Longitudinal Study. Authors' analysis

Note: Reference category is 'In employment'. Mortality follow-up periods: 1971 Census, 1972-1976; 1981 Census, 1982-1986; 1991 Census, 1992-1996; 2001 Census, 2002-2006.

Potential health selection effects

To consider the potential for health selection to affect the relationship between labour market position and mortality, sensitivity analyses were conducted looking at mortality in years 6-10 after each census 1971-1991. This would allow for any selection effects to wear off. The sensitivity analysis did not materially alter the substantive findings. During years 6-10 following the census, among both men and women, the mortality rate of those in employment was lowest; the permanently sick had the highest rate, with intermediate mortality rates for the other three labour market groups. The mortality disadvantage of the unemployed when compared with those in work was revealed by this sensitivity analysis, because it allowed health selection into the labour market to wear off – healthy workers had returned to work by then.

Table 4.4: Age-specific mortality rates of men and women around State Pension age, 1971-1991. Rates per 10,000. Deaths 6-10 years after census

Age group and census	Labour market position									
	In employment		Unemployed		Retired		Sick		Other inactive	
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
Men										
55-59										
1971	303	289-317	410	329-512	497	359-689	750	645-872	460	207-1025
1981	228	216-241	303	258-355	325	182-379	561	317-603	287	135-399
1991	140	129-151	239	201-284	225	415-529	357	258-420	232	163-808
60-64										
1971	458	438-479	587	501-687	637	854-933	976	704-1440	810	421-1683
1981	364	344-385	402	351-460	474	425-529	777	703-859	363	163-808
1991	252	235-272	327	279-385	321	292-354	519	474-568	351	218-565
65-69										
1971	727	678-779	555	315-977	893	854-933	1007	704-1440	842	421-1683
1981	505	458-557	365	152-877	675	647-704	1183	984-1421	1051	644-1716
1991	370	326-421	411	154-1094	532	508-556	963	834-1111	226	94-542
Women										
50-54										
1971	91	82-100	75	39-143	194	130-290	281	211-376	102	91-115
1981	64	57-72	131	86-201	304	266-316	263	126-200	94	70-98
1991	50	44-57	79	50-124	74	41-133	159	254-394	83	69-92
55-59										
1971	136	124-148	155	97-250	190	128-286	354	434-820	167	245-283
1981	116	105-127	154	102-232	157	108-229	317	254-394	159	146-174
1991	75	66-85	154	108-220	130	103-163	256	216-302	106	92-121
60-64										
1971	195	176-216	375	226-622	290	266-316	597	434-820	263	245-283
1981	165	145-188	192	62-597	253	227-283	516	400-666	235	219-251
1991	138	120-159	218	82-580	216	200-233	429	351-525	174	154-196

Source: ONS Longitudinal Study. Authors' analysis.

Note: Mortality follow-up periods: 1971 Census, 1977-1981; 1981 Census, 1987-1991; 1991 Census, 1997-2001.

4.4. Limiting long-term illness by labour market position

Table 4.5 reports the odds of limiting long-term illness ten years after the census for men and women in the various labour force positions at the 1981 and 1991 Censuses. The overall pattern is the same as for mortality; namely, the best health among those in employment, greatly increased odds of subsequent limiting long-term illness among the permanently sick and somewhat worse health than those in employment among the other labour market groups. The increased risks of limiting illness among unemployed people ten years after the measurement of the unemployment position is also notable, particularly as inter-censal mobility might be expected in the group, an issue explored in Chapter 5. Likewise the increased odds of illness among other inactive women stand out at both 1981 Census (OR=1.46, 95% CI 1.37-1.55) and 1991 Census (OR=1.44, 95% CI 1.35-1.53)

Table 4.5: Odds ratios (95% CI) for limiting long-term illness at next census: men aged 55-64 and women aged 50-59, 1981 and 1991

Labour market position	Men		Women	
	1981	1991	1981	1991
In employment	1.00	1.00	1.00	1.00
Unemployed	1.28 (1.15-1.41)	1.31 (1.17-1.45)	1.68 (1.40-2.03)	1.60 (1.37-1.86)
Retired	1.45 (1.28-1.64)	1.24 (1.14-1.36)	1.47 (1.16-1.86)	1.29 (1.14-1.46)
Permanently sick	8.37 (7.26-9.64)	8.11 (7.25-9.07)	13.52 (11.25-16.24)	11.75 (10.28-13.43)
Other Inactive	1.26 (0.71-2.23)	1.12 (0.82-1.54)	1.46 (1.37-1.55)	1.44 (1.35-1.53)

Source: ONS Longitudinal Study. Author's analysis

Notes: Adjusted for age and social class.

4.5. Discussion

This chapter has examined the relationship between labour market position and mortality over four decades, which have marked considerable change in society. Data from the ONS Longitudinal show the decline from almost full employment among men in 1971, alongside rising women's employment over the period. The processes of de-industrialisation are apparent in the study, with rising numbers permanently sick, and serendipitously, two periods of recession are marked in 1981 and 1991. In parallel with

these changes, the study's linkage to death registration has revealed considerable reductions in premature mortality over the period - mortality rates have at least halved with a few exceptions for specific groups. The data used are large-scale population data, and given confidence in the patterns observed. These results confirm the association between labour market position and health that is the subject of the wealth of studies described in Chapter 2. This study adds to the literature with a focus on an older population and new periods of data building on previous studies of unemployment and mortality for England and Wales (for example (Moser et al., 1987)). Unemployment is less of a concern for the present study, however, because relatively few men and hardly any women occupy these roles at the ages examined here. The findings are nonetheless consistent with previous studies of mortality and unemployment based on the ONS-LS (Moser et al., 1984, Moser et al., 1986, Moser et al., 1987) and build on results shown elsewhere (Akinwale et al., 2010).

General stability of mortality by labour market position

The relationship between labour market position and health has been remarkably stable over time with highest mortality among people not in employment due to permanent sickness and lowest mortality among those people in paid employment. The relative risks of mortality for people in employment when approaching their pensionable years have remained around a third lower than other groups among men, and up to 40 per cent lower among women. Within these broad patterns there is a degree of variation by gender and cohort.

Differences in ageing

The results also highlight some cohort differences in the pace of mortality declines by labour market position, which may indicate differences in the process of ageing between groups. Rapid and consistent declines in mortality are evident for successive cohorts of employed men and women, but the path is not so steady or clear-cut for other labour market groups. This is hardly surprising given the significant social and economic changes that have been discussed, particularly for housewives and other groups who do

not participate in the labour market such as permanently sick people. The cohort differences observed for some groups - such as other inactive women - could well be due to statistical error given relatively small samples in this group within each cohort. The changes are also likely to reflect changes in the composition of groups over time, with women being less likely to identify as housewives over time.

Strengths and limitations

Although this analysis used methods to take into account the possibility of health selection effects, it is still possible that selection may affect some of these results. Health selection into the various labour market positions may mean that the associations are short-term reflections of acute illness among people in non-employed roles, rather than longer lasting effects of exposure to such roles. Sensitivity analysis, which excluded deaths during the first five years of follow-up, attempted to account for health selection. This was based on the assumption that the majority of people who leave employment due to illness will die relatively quickly and will therefore have low 5-year survival. While there was a degree of attenuation in the results, the pattern of mortality risk by labour market position remained unchanged. The worse health of the permanently sick is a long-term phenomenon.

The measure of labour force position used in this analysis is cross-sectional and of course, does not capture the full extent of individuals' labour market history or exposure to occupational hazards. Movement between labour market positions from census to census could dilute the strength of the study's observed relationships although, if that were the case, the results presented would be conservative estimates. Chapter 5 explores the issue of inter-censal mobility between labour market positions shedding some light on this issue. In part, understanding the drivers of individual changes in labour market position is as important as understanding whether there is any causal relationship between labour market position and subsequent health. The former may well be a combination of individual circumstances, choice and economic drivers.

Two health outcomes were used in this analysis: mortality and limiting long-term

illness. Mortality is a useful outcome for statistical purposes but a partial measure for describing health comprehensively. Health is more than the mere vital signs of life. Chronic disabilities like musculoskeletal disorders that would rarely result in death are not captured by mortality as an indicator. The use of limiting long-term illness addresses these limitations to some degree. As the pattern of limiting long-term illness by labour market was consistent with results seen for mortality, this gives some confidence in the findings.

4.6. Conclusion

There have been dramatic improvements in mortality rates over the period since 1971. However, not all groups have enjoyed the same improvements in longevity. Women were participating in the labour market in greater numbers over the period, but there was an increase in relative ill health and mortality of those unemployed or inactive and looking after their homes and families. The numbers of permanently sick people rose significantly partly due to changes to welfare policies. It might be expected that over time, the group increasingly comprised people who were less seriously ill. In fact the relative health and mortality of permanently sick people did not improve though successive cohorts but people in this group did see reductions in their absolute mortality risk.

5. Labour market trajectories, domestic work and later life health

A consideration of the accumulation of risk over the course of different life trajectories is one lens through which a life course perspective can be pursued. This approach, however, poses the challenge of how best to describe individual trajectories in a meaningful way. Using the BHPS, this chapter describes an exploratory approach for examining trajectories of labour market position in the period 1991-2001 using latent class mixture models, an empirical approach that can be used to identify patterns in longitudinal data and classify them into groups. This latent class analysis is supported by descriptive analysis of labour market histories in the BHPS. Two key questions are addressed: how are different trajectories of labour market position associated with health in later life? Do associations vary by gender and health outcome?

Domestic work is often thought to be women's work bound up with notions of what makes a 'good woman' (Crompton, 2006). Yet, as we have seen, the gender division of labour is changing. As women's roles increasingly encompass employment, families are bargaining over the share of domestic chores. While some households have the means to buy in domestic labour, for many, domestic work is a taken-for-granted aspect of daily life. But does it affect our health? And do the health effects of domestic work depend on the other daily commitments we have, such as paid employment? Or is the more important factor our perception about whether domestic workloads are manageable? These questions are the focus of another lens to the issue of work and health. The research on domestic work and health presented here is based on analysis of the BHPS, which, as we shall see, supports some investigations of domestic work and health, but also has some important limitations.

5.1. Method

The British Household Panel Survey was used to select a sample of people aged around 45-64 in 2001 respectively. Specifically, the cohort included people aged 45-64 in 2000, 2001 or 2002 (2,393 subjects) to increase the sample size and statistical power. This approach enabled trajectories of labour market position 1991-2001, which cannot be examined in the ONS-LS, to be related to subsequent health outcomes, particularly to enable analysis of health outcomes.

Measures

The details of the measures used are described in Chapter 3 and information relevant to the method used for this chapter set out briefly here. Labour market position was examined at each year from 1991 to 2001 considered in six groups, as described in Chapter 3. The health outcome measures used were psychiatric morbidity (indicated using GHQ-12 caseness) and limiting long-term illness. Adjustments were made for prior health status or health at baseline to adjust for health selection effects within statistical models. Domestic work was considered using variables on housework hours categorised into groups of hours per week (0-4, 5-9, 10-19 and 20+ hours). Perceived fairness of household work allocations was also examined at wave 2 (1992).

Statistical methods and analytical strategy

Labour market trajectories were investigated descriptively by looking at the degree of permanence and transitions between states. Indicators to describe the different labour market histories 1991-2001 were derived in two ways. The first approach, which I refer to as **cumulative labour market position**, involved a simple count of the number of times an individual was in a particular labour market position at each wave in the period 1991-2001, for comparability with the ONS-LS Census data. For the second approach, I used latent class growth mixture models to examine labour market positions recorded for individuals between 1991 and 2001. The latent class mixture model is a particular form of latent class analysis, an empirical method that can be used for classification of people (Muthén and Muthén, 2000).

In mixture models, it is assumed that observations made in a sample arising from different population groups can be represented by an unobserved categorical variable (the latent classes). When applied to longitudinal data, the aim of latent class analysis is to distinguish subgroups in the population that have similar patterns of change over time – in this case considering changes in labour market position. The approach assumes that there is a single latent variable underlying the observed repeated measures (of labour market position in this case). Trajectories of labour market position 1991-2001 were modelled jointly for men and women and adjusted for sex; the latent variable arising from the applied growth mixture model is a categorical variable. Several solutions were modelled to identify the potential number of classes that would best describe the data, and model fit statistics were used to determine the preferred solution following the methods described by Nylund et al. (2007) which suggest assessing multiple fit statistics, including information criteria and likelihood ratio tests to decide on an appropriate class solution. Additionally, descriptive analysis was used to profile the groups generated by the latent class analysis and decide on the most appropriate solution. The models were implemented using MPlus. The preferred solution was a five-class solution. The resulting variable is referred to as the **labour market trajectory**.

The modelling strategy for examining the relationship between different labour market histories and subsequent health was the same for both approaches used to describe the histories. The variables indicating cumulative labour market position and labour market trajectories were each related to limiting long-term illness and psychiatric morbidity in 2002 using logistic regression.

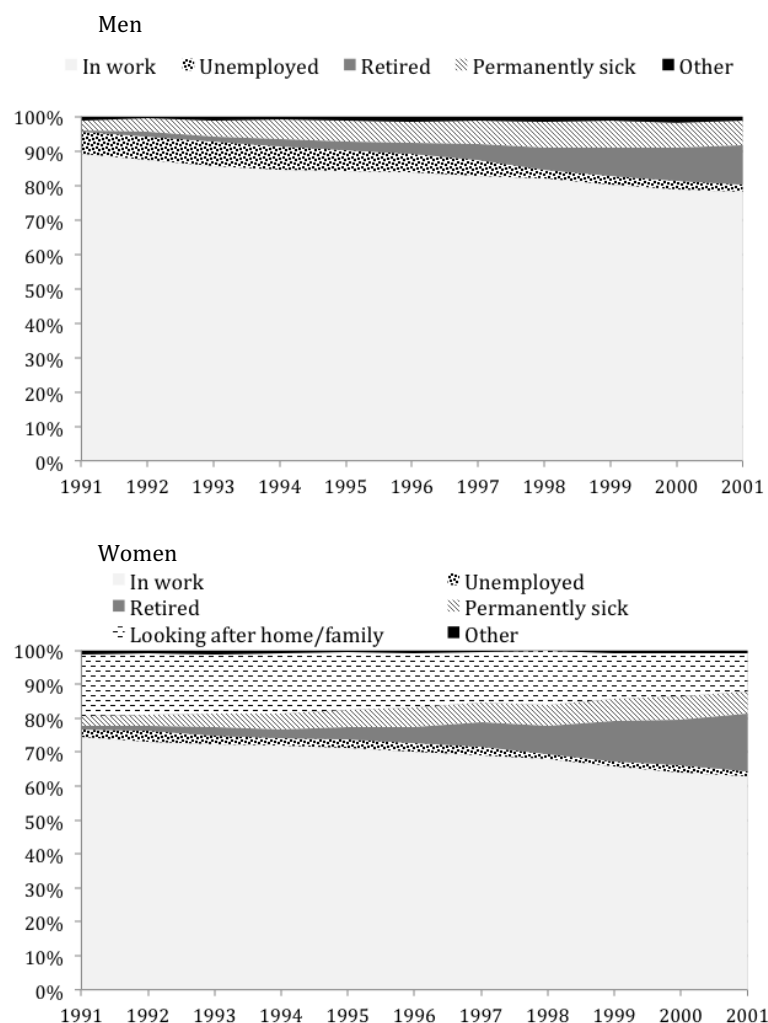
To look at the relationship between domestic work and health, the number of hours spent on housework per week was related to limiting illness and psychological distress (GHQ-12 caseness) in the period 1992-2008 using Cox regression and treating hours of housework as a time-varying explanatory variable. Adjustments for health selection were made using limiting illness and psychological distress at baseline (1991). Analyses were performed separately for men and women, and considered differences in relationship by broad labour market position (whether in employment or not) due to

relatively small sample sizes. The selected sample included 906 men and 1,030 women.

5.2. Describing labour market trajectories, 1991-2001

Considering change at a population level, the distribution of 2001 cohort between different labour market positions is illustrated in Figure 5.1 for men and women respectively.

Figure 5.1: Distribution of labour market position for 2001 cohort BHPS, 1991-2001



Source: British Household Panel Survey. Author's analysis.

As might be expected the proportions in employment declined over time as the cohort aged, and there were corresponding increases in the proportions retired. For both men and women however, slight increases in the relative numbers permanently sick are also apparent. Between 1991 and 2001, the proportion of permanently sick men

rose from 3 per cent to 7 per cent, and permanently sick women, from 3 per cent to 6 per cent.

Considering individual histories of labour market position, it is apparent that there was a great degree of stability in employment roles over time (Table 5.1). Overall, 73 per cent of people were in employment in 1991: 89 per cent of men and 62 per cent of women. Of those in employment in 1991, the vast majority were also in employment in 2001 (83 per cent of men and 78 per cent of women). Additionally most were employed throughout the period 1991-2001 although this was somewhat less likely among women (52 per cent) than among men (63 per cent). On average those in employment in 1991 spent 9.4 years of the 11-year period in that position, and there was only a very slight gender difference with men spending marginally longer employed.

Apart from the employed group, there was also a fair degree of stability among the permanently sick group, as might be expected. About 3 per cent of people were permanently sick in 1991, of whom 71 per cent were in the same category in 2001. However, some transition between permanent sickness and other groups was also apparent as only about a third were recorded in the group consistently throughout the period 1991-2001. Any movements out of the permanently sick group would have typically been to other non-employed positions as, on average, those permanently sick in 1991 spent less than 1 year in employment.

The labour market histories of people who were unemployed in 1991 were much less stable – it was the least permanent of all states. More men than women were unemployed in 1991 (6.7 per cent and 1.9 per cent respectively) but it was very rare that someone of either gender unemployed at the start of the period remained so throughout the period (2.1 per cent). Hardly any men were looking after the home or family. Among women, those looking after the home or family in 1991 also spent an average of 1.2 years of the decade in employment, and fewer than one in five occupied the role throughout the period.

Table 5.1: Summary of labour market history, 1991-2001. BHPS: people aged 45-64 around 2001

Labour market position in 1991	% in group in 1991	% in same group in 2001	% always in same group 1991-2001	Mean number of years in employment
Men (N=1,097)				
In employment	89.0	83.5	69.8	9.9
Unemployed	6.6	11.1	4.2	4.6
Retired	0.3	100.0	33.3	0.0
Permanently sick	3.1	73.5	50.0	0.2
Looking after home/family	0.5	40.0	0.0	1.2
Other	0.6	0.0	0.0	3.3
Total (all groups)	100.0	77.8	64.0	9.2
Women (N=1296)				
In employment	74.4	72.5	56.9	9.9
Unemployed	2.2	3.5	0.0	4.6
Retired	1.2	86.7	20.0	0.0
Permanently sick	2.7	65.7	28.6	0.2
Looking after home/family	18.4	36.0	20.9	1.2
Total (all groups)	100.0	63.4	47.2	9.2
All (N=2393)				
In employment	81.1	78.0	63.4	9.2
Unemployed	4.2	8.9	3.0	4.7
Retired	0.8	88.9	22.2	0.8
Permanently sick	2.9	69.6	39.1	0.6
Looking after home/family	10.2	36.1	20.5	2.9
Other	0.9	0.0	0.0	8.0
Total (all groups)	100.0	70.0	54.9	7.6

Source: British Household Panel Survey. Author's analysis.

Latent Class Analysis

Table 5.2 shows the resulting fit statistics from latent class analysis on trajectories of labour market position 1991-2001 for the cohort aged 45-64 around 2001. A number of different solutions were estimated, ranging up to an eight-class solution. The model fit can be determined using likelihood ratio test methods (LRTs) and with Information Criterion tests (AIC, BIC)(Nylund et al., 2007). Smaller values indicate a better fitting model. Several models were run to test whether more classes would significantly improve the fit and interpretability of the model. Entropy was also used an indicator to inform the selection of the final solution. Entropy indicates how well the model has predicted class membership, measured on a zero to one scale, with higher values indicating a better fit.

Taken together, the different indicators of model fit point towards a 5-class or 6-class solution – changes in the AIC and BIC were smaller when moving beyond a 6-class solution. Likewise there was no statistically significant improvement in the fit of the solution considering different likelihood ratio test statistics (LMR LRT and Vuong-Lo-Mendell Rubin LRT; $p > 0.05$). When the data were examined descriptively, the 6-class solution was no more interpretable than the 5-class solution, and therefore the more parsimonious solution was preferred.

Table 5.2: Latent class analysis of BHPS employment trajectories, 1991-2001: fit statistics for different solutions

	Number of classes in solution							
	1	2	3	4	5	6	7	8
AIC	38670.972	36754.152	36014.23	35429	34943.603	34633.33	34315.979	
BIC	38749.493	36850.794	36128.992	35562	35094.607	34802.454	34503.222	
Adjusted BIC	38708.187	36799.955	36068.621	35492	35015.171	34713.486	34404.723	
Entropy	0.899	0.885	0.879	0.868	0.807	0.693	0.67	
Log likelihood	-24299.871	-18361.076	-18361.076	-18045	-17446.802	-17411.323	-17288.665	
Conditional -2LL difference	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
LMR LRT		1846.276	716.228	678.044	387.222	235.55	310.48	
p		<0.0001	<0.0001	<0.0001	0.0146	0.1553	0.078	
Vuong-Lo-Mendell Rubin LRT		1922.82	745.922	706.155	403.275	245.315	323.352	
p		<0.001	<0.001	<0.001	0.0128	0.1486	0.0724	
Distribution of classes								
1	100	67%	63%	63%	61%	54%	65%	51%
2		33%	25%	18%	16%	15%	9%	21%
3			12%	13%	10%	10%	6%	8%
4				6%	7%	8%	6%	5%
5					6%	7%	6%	4%
6						6%	4%	4%
7							4%	4%
8								3%

Source: British Household Panel Survey. Author's analysis.

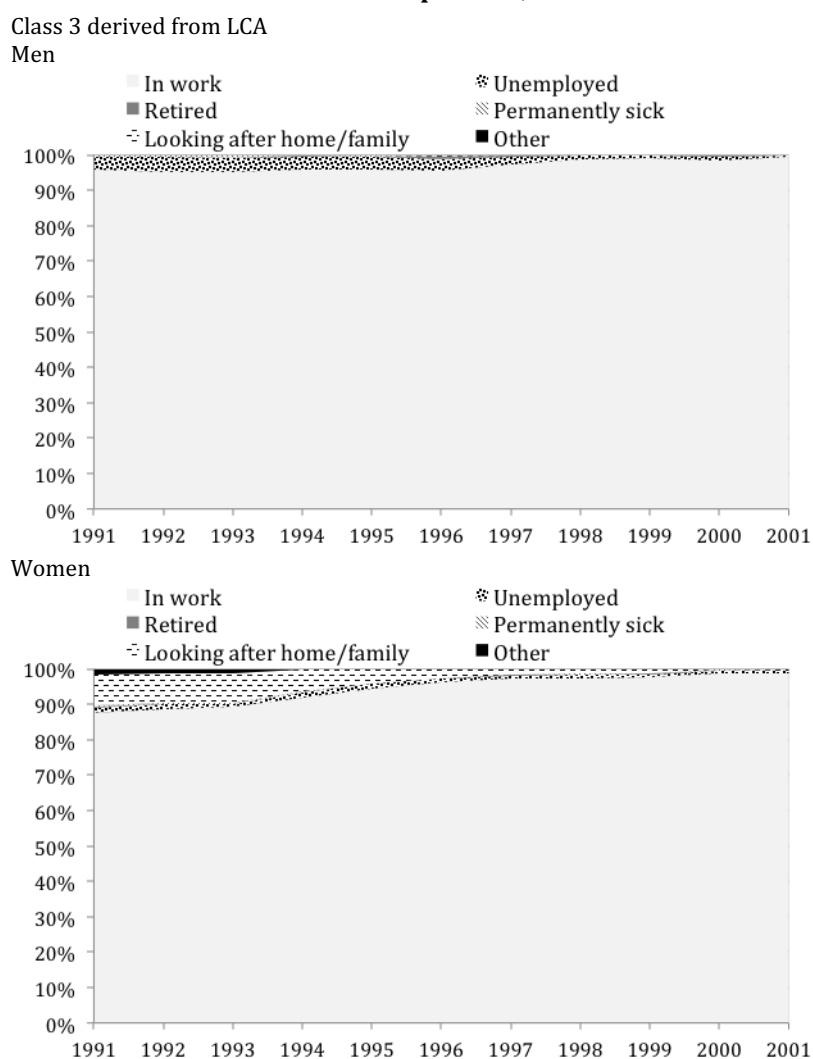
The characteristics of each trajectory group in the 5-class solution were explored descriptively to enable each group to be labelled. Figures 5.2 to 5.6 show the labour market distribution of each trajectory group over the period 1991-2001, indicating

considerable differences between groups. The socio-demographic characteristics of each trajectory group are shown in Table 5.3 to further illustrate their compositions.

Stably employed

The largest group comprising 70 per cent of men and 53 per cent of women was labelled stably employed. This group had virtually full employment throughout the period, though about 3 per cent of men were unemployed, in early part of the decade up to 1995 and about 8 per cent women were looking after the home or family (Figure 5.2).

Figure 5.2: Distribution of labour market position, BHPS 1991-2001: stably employed group



Source: British Household Panel Survey. Author's analysis.

This group comprised a higher proportion of men (53 per cent) than the average for all groups (46 per cent), was most likely to comprise people living in a couple household with children, and was youngest on average (51 years for women, 52 years for men).

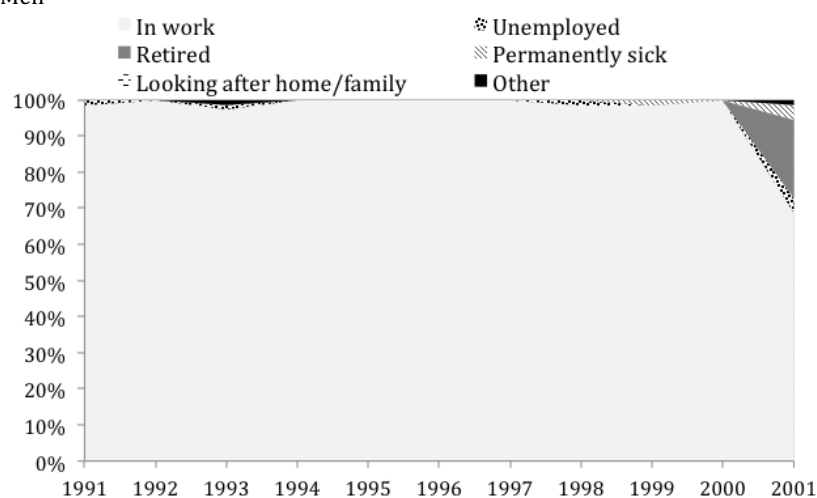
Moving to retirement

Most similar to the stably employed group, were those labelled moving to retirement. The key difference was that the latter group began to move into retirement from 1999. By 2001, 21 per cent of men and 28 per cent of women in the group were retired. The moving to retiring group was older (median age 58) and more female (58 per cent women) than the stably employed group.

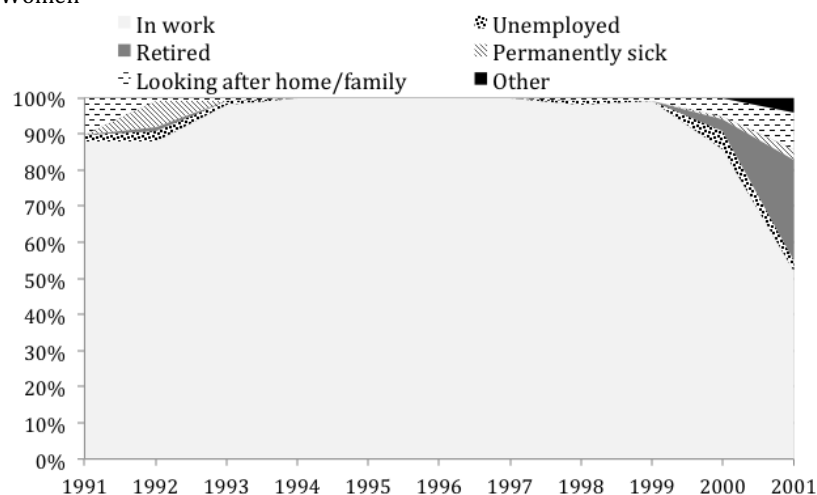
Figure 5.3: Distribution of labour market position, BHPS 1991-2001: moving to retirement group

Class 1 derived from LCA

Men



Women



Source: British Household Panel Survey. Author's analysis.

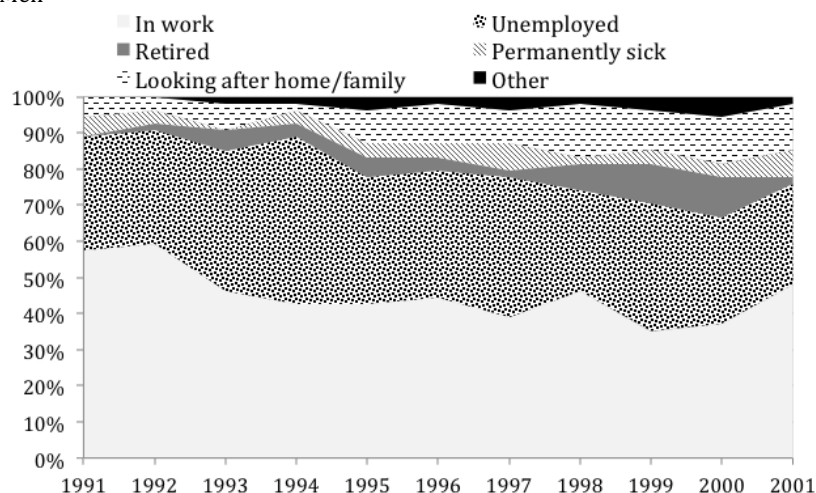
Long-term non-employed

About one in six of the sample were classified to the trajectory group labelled long-term non-employed. The group mainly comprised women (79 per cent) but also some men who were identified as having similar experiences to the women in the group. Among men, this group had the highest rates of unemployment across the decade, generally above 30 per cent, but also relatively large numbers economically inactive and looking after the home or family. Among women, the experience of looking after the home or family was to predominate throughout the period – generally more than half of women in the group occupied that position in a given year. This group had the highest rates of lone parenthood (9 per cent).

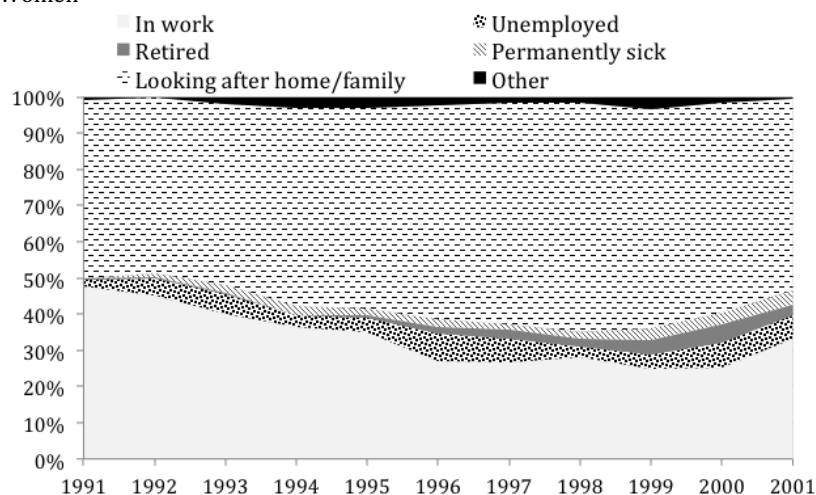
Figure 5.4: Distribution of labour market position, BHPS 1991-2001: long-term non-employed group

Class 4 derived from LCA

Men



Women



Source: British Household Panel Survey. Author's analysis.

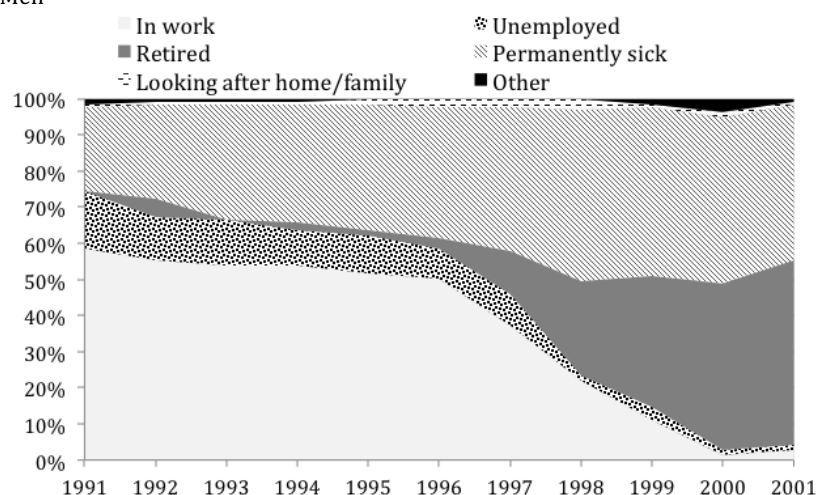
Long-term sick

One group with a particularly striking labour market pattern was labelled long-term sick. Throughout the period those in this trajectory were most likely of all groups to be permanently sick. It is likely that there was some mobility between permanent sickness and other labour positions in this group and permanent sickness preceding retirement. Those with long-term sick trajectories were also most likely to be living in a non-couple household in 1991 - about one in four did, compared with one in six for the cohort as a whole.

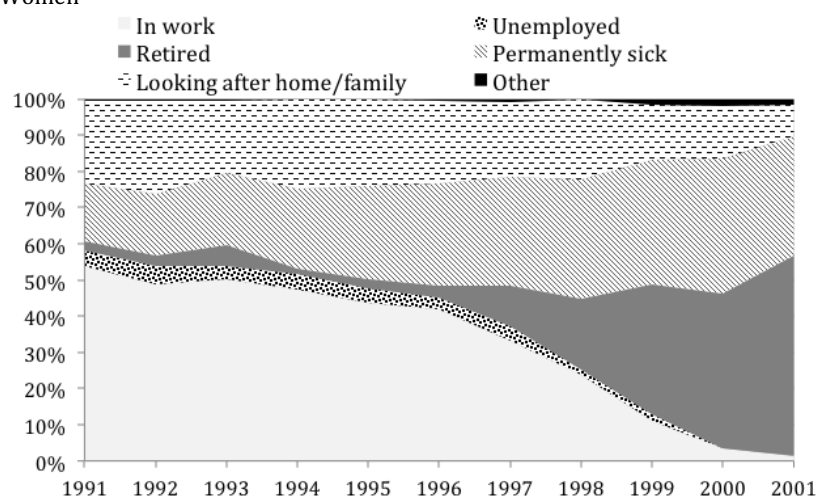
Figure 5.5: Distribution of labour market position, BHPS 1991-2001: long-term sick group

Class 2 derived from LCA

Men



Women



Source: British Household Panel Survey. Author's analysis.

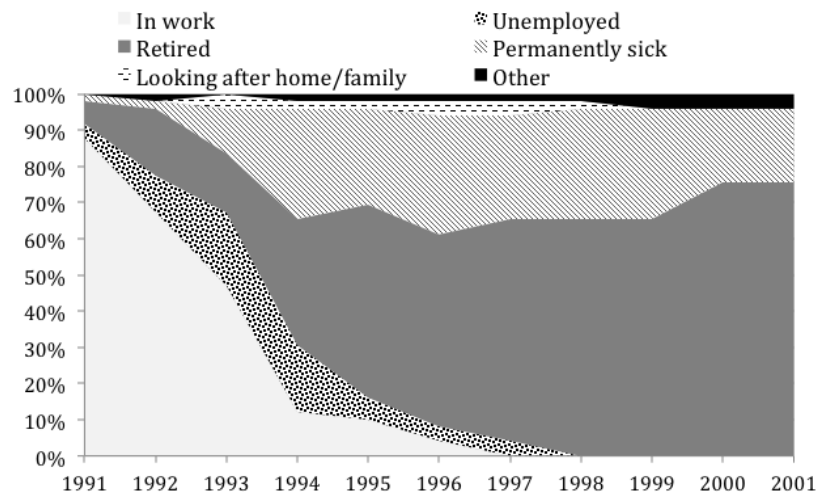
Retirees

The final group is labelled retirees because it comprises the older members of the sample (median age 62) who had practically all retired by 2001. This was broadly the case for both men and women, although experiences of the permanent sick role were also relatively common for men.

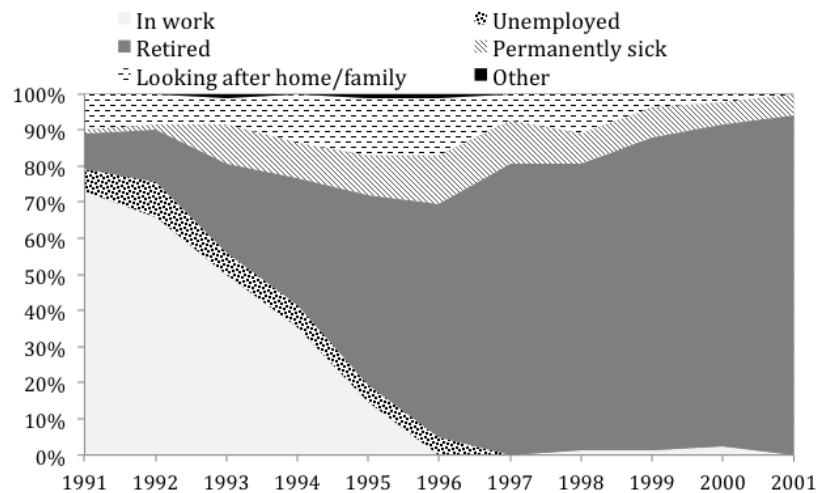
Figure 5.6: Distribution of labour market position, BHPS 1991-2001: retirees

Class 5 derived from LCA

Men



Women



Source: British Household Panel Survey. Author's analysis.

Table 5.3: Socio-demographic characteristics of BHPS labour market trajectory groups,

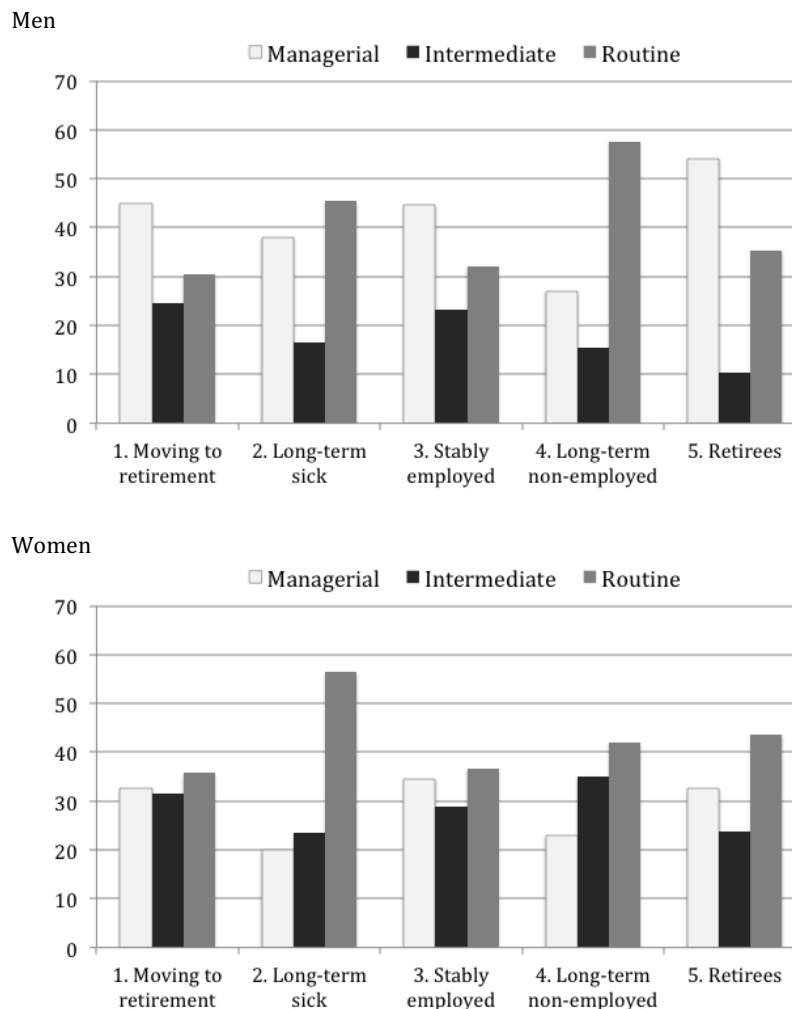
	1. Moving to retirement	2. Long-term sick	3. Stably employed	4. Long-term non-employed	5. Retirees	Total
% Distribution by trajectory group (row %)						
All people	7.4	14.8	60.8	11.2	5.8	100
Men	6.7	13.1	70.3	5.2	4.7	100
Women	8.0	16.3	52.7	16.4	6.7	100
Mean age in 2001						
Women	58.0	59.0	51.0	52.0	62.0	54.0
Men	58.0	59.0	52.0	51.5	62.0	54.0
% Women	58.3	59.5	47.0	78.9	62.6	54.2
Household type distribution (column %)						
Couple with children	25	22.2	49.6	49.2	14.5	41.7
Couple with no children	58.9	52.1	33.7	30.9	64.9	39.8
Single	12.5	20.1	9.3	9.4	11.5	11.2
Lone parent	3.0	4.1	6.1	9.0	4.6	5.8
Other	0.6	1.5	1.2	1.6	4.6	1.5
Total	100	100	100	100	100	100

Source: British Household Panel Survey. Author's analysis.

Socio-economic position of groups

The socio-economic profile of each trajectory group is shown in Figure 5.7 using NS-SEC in 1991. The long-term sick and long-term non-employed groups stand out as being relatively more likely to comprise people from routine occupations among both men and women with stepwise gradients evident for women. However, the pattern was more mixed for other groups and differed by gender. Additionally few men had backgrounds in intermediate occupations (the least common socio-economic position across trajectory groups) and therefore among men, the trajectory groups tended to be polarised between those with managerial and routine occupational backgrounds.

Figure 5.7: NS-SEC distribution in 1991 by labour market trajectory group, BHPS 2001 cohort



Source: British Household Panel Survey. Author's analysis.

5.3. Health sequelae of labour market histories

This section considers results of models examining the health sequelae of

cumulative labour market position indicated by the number of times an individual occupied a particular labour market position in the decade 1991-2001. It also considers the health outcomes associated with labour market trajectories derived using latent class analysis. The association of different labour market histories was considered with logistic regression analysis on limiting long-term illness and psychological distress. Effects on mortality were also considered using Cox proportional hazards models examining deaths in the period 2002-2008. Each of the health outcomes is considered in turn.

Limiting illness

More years in employment over the decade were associated with a decreased risk of subsequent limiting illness among both men (OR=0.81, 95% CI 0.77-0.85) and women (OR=0.88, 95% CI 0.85-91). The same could not be said for the cumulative experience of other labour market positions, which in general were associated with an increased risk of limiting long-term illness as compared with no experience of the position. For example, cumulative exposure to unemployment increased the risk of limiting long-term illness among men (OR = 1.16, 95% CI 1.05 – 1.28) and women (OR = 1.27, 95% CI 1.04 – 1.56), as did exposure to the permanently sick role (men OR = 1.56, 95% CI 1.39 – 1.76; women OR 1.69, 95% CI 1.48 – 1.94). This was despite adjustments for NS-SEC and limiting illness at baseline to take into account potential health and social selection into non-employed positions. Greater time spent looking after the home or family, however was not associated with any different risk of subsequent limiting long-term illness (coefficients were not statistically significant).

Table 5.4: Cumulative labour market positions, 1991-2001: odds ratios for limiting long-term illness 2002 given number of waves in a position, BHPS cohort aged 45-64 around 2001

	Men				Women			
	OR	p	95% CI		OR	p	95% CI	
			Lower	Upper			Lower	Upper
Employment								
Number of waves in employment	0.81	0.000	0.77	0.85	0.88	0.000	0.85	0.91
NS-SEC (Ref: Professional)								
Intermediate occupations	1.65	0.033	1.04	2.62	1.22	0.333	0.82	1.82
Routine occupations	1.43	0.084	0.95	2.16	1.51	0.026	1.05	2.18
Limiting longstanding illness 1991	5.27	0.000	3.15	8.80	6.66	0.000	4.57	9.71
Age	1.02	0.124	0.99	1.05	1.02	0.070	1.00	1.05
Constant	0.37	0.181	0.09	1.59	0.16	0.002	0.05	0.50
Unemployment								
Number of waves unemployed	1.16	0.004	1.05	1.28	1.27	0.022	1.04	1.56
NS-SEC (Ref: Professional)								
Intermediate occupations	1.45	0.105	0.93	2.27	1.37	0.123	0.92	2.06
Routine occupations	1.60	0.018	1.08	2.36	1.84	0.001	1.27	2.65
Limiting longstanding illness 1991	9.84	0.000	6.20	15.61	8.49	0.000	5.85	12.32
Age	1.05	0.000	1.03	1.08	1.05	0.000	1.02	1.07
Constant	0.01	0.000	0.00	0.04	0.02	0.000	0.01	0.05
Permanent sickness								
Number of waves permanently sick	1.56	0.000	1.39	1.76	1.69	0.000	1.48	1.94
NS-SEC (Ref: Professional)								
Intermediate occupations	1.47	0.104	0.92	2.33	1.65	0.020	1.08	2.53
Routine occupations	1.39	0.121	0.92	2.09	1.77	0.005	1.19	2.62
Limiting longstanding illness 1991	3.90	0.000	2.23	6.81	5.09	0.000	3.37	7.69
Age	1.04	0.006	1.01	1.07	1.05	0.000	1.02	1.07
Constant	0.02	0.000	0.01	0.08	0.01	0.000	0.00	0.04
Looking after home/family								
Number of waves looking after the home/family	1.12	0.255	0.92	1.38	1.03	0.253	0.98	1.08
NS-SEC (Ref: Professional)								
Intermediate occupations	1.48	0.083	0.95	2.32	1.38	0.118	0.92	2.07
Routine occupations	1.71	0.006	1.17	2.52	1.86	0.001	1.29	2.69
Limiting longstanding illness 1991	9.78	0.000	6.17	15.48	8.38	0.000	5.78	12.16
Age	1.05	0.000	1.03	1.08	1.05	0.000	1.02	1.07
Constant	0.01	0.000	0.00	0.04	0.02	0.000	0.01	0.05

Source: BHPS. Author's Analysis

The association between labour market trajectories based on latent class analysis of labour market histories, and limiting long-term illness is shown in Table 5.5. With this approach, compared with the stably employed group all other groups had an increased risk of limiting illness. The results for those classified as retirees or long-term sick are particularly striking. However, people in the long-term non-employed group, also had higher rates of limiting illness including among women (OR=3.6, 95% CI, 2.30 – 5.63). As we have seen those long-term non-employed among women comprise a large group of

people who would have spent significant periods looking after their home or family so these results contrast with those based on a simple frequency count of exposure to the 'homemaker' role.

Table 5.5: Labour market trajectories 1991-2001: odds ratios for limiting long-term illness in 2002, BHPS cohort aged 45-64 around 2001

	Men				Women			
	OR	p	95% CI		OR	p	95% CI	
			Lower	Upper			Lower	Upper
Labour market trajectory group (Ref=Stably employed)								
Moving to retirement	2.77	0.003	1.43	5.36	8.14	0.000	4.63	14.33
Long-term sick	7.99	0.000	4.75	13.43	10.43	0.000	6.37	17.10
Long-term non-employed	2.21	0.039	1.04	4.69	3.60	0.000	2.30	5.63
Retirees	10.29	0.000	4.98	21.25	14.72	0.000	7.63	28.42
NS-SEC (Ref: Professional)								
Intermediate	1.89	0.008	1.18	3.03	1.49	0.067	0.97	2.30
Routine	1.76	0.007	1.17	2.66	1.84	0.002	1.25	2.73
Limiting long-term illness, 1991	5.91	0.000	3.56	9.82	6.52	0.000	4.34	9.80
Age	0.99	0.396	0.95	1.02	0.95	0.002	0.92	0.98
Constant	0.13	0.003	0.03	0.50	0.40	0.155	0.11	1.42

Psychological distress

The associations of labour market histories with psychological distress were weaker than those observed for limiting long-term illness and there were some interesting gender differences. Cumulative employment was significantly associated with a decreased risk of psychological distress among men (OR=0.93, 95% CI, 0.89-0.97), but not among women (OR=0.99, 95% CI, 0.95-1.02). Cumulative unemployment was associated with increased risk of poor psychological health among women (OR=1.26, 95% CI, 1.06-1.51) but not men (OR=0.95, 95% CI, 0.85-1.08). Cumulative experience looking after the home or family was not associated with psychological distress for men or women. However, consistent with other findings, those permanently sick on more occasions had a greater risk of psychological distress regardless of gender. These findings were broadly mirrored when odds of psychological distress were modelled based on labour markets trajectories generated through latent class analysis (Table 5.7). However, only those long-term sick had significantly increased odds of psychological distress.

Table 5.6: Cumulative labour market positions 1991-2001: odds ratios for psychiatric morbidity (GHQ-12) in 2002 given number of waves in a position, BHPS cohort aged 45-64 around 2001

	Men				Women			
	OR	p	95% CI		OR	p	95% CI	
			Lower	Upper			Lower	Upper
Employment								
Number of waves in employment	0.93	0.002	0.89	0.97	0.99	0.368	0.95	1.02
NS-SEC (Ref: Professional)								
Intermediate occupations	1.38	0.107	0.93	2.03	1.13	0.441	0.82	1.57
Routine occupations	0.94	0.736	0.66	1.35	0.98	0.885	0.72	1.32
Psychiatric morbidity 1991	1.06	0.381	0.93	1.22	1.02	0.704	0.92	1.13
Age	0.97	0.012	0.94	0.99	1.00	0.826	0.98	1.02
Constant	1.81	0.371	0.49	6.65	0.47	0.140	0.17	1.28
Unemployment								
Number of waves unemployed	0.95	0.455	0.85	1.08	1.26	0.010	1.06	1.51
NS-SEC (Ref: Professional)								
Intermediate occupations	1.38	0.102	0.94	2.04	1.12	0.477	0.81	1.55
Routine occupations	1.05	0.767	0.74	1.50	0.96	0.804	0.71	1.30
Psychiatric morbidity 1991	1.06	0.419	0.92	1.22	1.02	0.663	0.92	1.14
Age	0.98	0.083	0.96	1.00	1.00	0.914	0.98	1.02
Constant	0.58	0.313	0.20	1.67	0.38	0.031	0.16	0.92
Permanent sickness								
Number of waves permanently sick	1.15	0.000	1.08	1.23	1.12	0.000	1.06	1.19
NS-SEC (Ref: Professional)								
Intermediate occupations	1.33	0.148	0.90	1.97	1.15	0.383	0.84	1.59
Routine occupations	0.89	0.531	0.62	1.28	0.94	0.674	0.69	1.27
Psychiatric morbidity 1991	1.07	0.354	0.93	1.22	1.02	0.745	0.92	1.13
Age	0.97	0.015	0.95	0.99	1.00	0.768	0.98	1.02
Constant	0.81	0.709	0.28	2.39	0.41	0.047	0.17	0.99
Looking after home/family								
Number of waves looking after the home/family	1.04	0.714	0.84	1.29	0.97	0.120	0.93	1.01
NS-SEC (Ref: Professional)								
Intermediate occupations	1.37	0.110	0.93	2.02	1.17	0.351	0.84	1.61
Routine occupations	1.03	0.885	0.72	1.46	1.02	0.898	0.75	1.38
Psychiatric morbidity 1991	1.06	0.409	0.92	1.22	1.02	0.745	0.92	1.13
Age	0.98	0.083	0.96	1.00	1.00	0.956	0.98	1.02
Constant	0.57	0.301	0.20	1.65	0.40	0.041	0.16	0.97

Source: BHPS. Author's Analysis

Table 5.7: Labour market trajectories 1991-2001: odds ratios for psychiatric morbidity (GHQ-12) in 2002, BHPS cohort aged 45-64 around 2001

	Men				Women			
	OR	p	95% CI		OR	p	95% CI	
			Lower	Upper			Lower	Upper
Labour market trajectory group (Ref=Stably employed)								
Moving to retirement	0.84	0.641	0.40	1.77	1.61	0.056	0.99	2.61
Long-term sick	2.43	0.000	1.51	3.91	1.53	0.035	1.03	2.28
Long-term non-employed	1.37	0.380	0.68	2.78	1.31	0.149	0.91	1.88
Retirees	1.69	0.183	0.78	3.65	1.23	0.496	0.68	2.22
NS-SEC (Ref: Professional)								
Intermediate	1.42	0.078	0.96	2.10	1.12	0.476	0.81	1.55
Routine	0.97	0.874	0.68	1.39	0.97	0.820	0.71	1.31
Psychiatric morbidity, 1991	1.06	0.403	0.92	1.22	1.03	0.587	0.93	1.14
Age	0.96	0.005	0.93	0.99	0.99	0.271	0.96	1.01
Constant	1.09	0.882	0.34	3.50	0.59	0.305	0.21	1.62

5.4. Housework by labour market position

We have seen that both cross-sectional and longitudinal exposures to different labour market position are associated with subsequent ill health, but to what degree are experiences of informal housework also associated with ill health? The remainder of this chapter considers how the relationship between domestic work and risk of limiting illness comparing people in paid employment with those not employment.

In common with other studies, there was a clear gender difference in the amount of time spent on housework. As can be seen in Table 5.8, the typical experiences of men and women were polar opposites. Just 3 per cent of men did 20 or more hours housework per week, while 58 per cent did 0-4 hours per week. Among women the reverse was true, 59 per cent of women did 20 or more hours of housework per week and 3 per cent did fewer than 5 hours housework a week.

Table 5.8: Distribution of time spent on housework per week by gender, BHPS, 2002

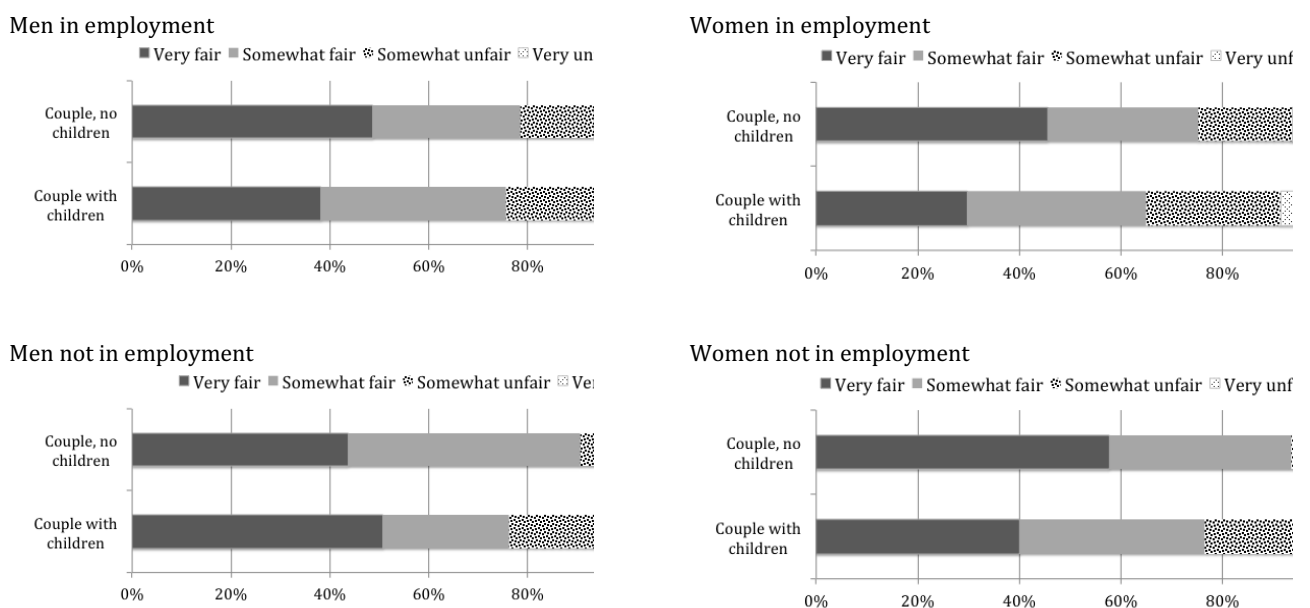
	Men	Women	Total
	%	%	%
0-4 hours	58.17	2.52	28.56
5-9 hours	24.39	8.25	15.81
10-19 hours	14.46	30.39	22.93
20+ hours	2.98	58.83	32.7
Total	100	100	100

Source: British Household Panel Survey. Author's analysis.

The vast majority of women (90 per cent) did 10 or more hours housework per week whereas only about one in six men did.

Despite considerable gender differences in the reported time spent on housework, gender differences in perceptions of the fairness of housework allocations were not as large as might be expected, though women were more likely to report that allocations were unfair. Figure 5.8 shows that this varied according to whether couples had children living with them and, labour market position. Overall, for both men and women, those not in employment were more likely to report that their housework allocation was very fair or somewhat fair. Across all groups, couples with children were more likely to report that the sharing of housework was unfair.

Figure 5.8: Perceptions of fairness of housework allocations by gender and whether in employment, 2002: BHPS 2001 cohort



Source: British Household Panel Survey. Author's analysis.

5.5. Associations between housework, labour market position and health

Table 6.2 shows the results of event history analysis on limiting long-term illness over the course of waves 2 to 18 in the BHPS. Illness was modelled dependent on housework hours and perceptions of the fairness of housework role as well as age.

Limiting illness at the survey baseline was to account for potential health selection effects, and was the strongest predictor of subsequent ill health. For men overall, perceived unfairness of housework role was, paradoxically, associated with a lower risk of subsequent illness. Among women, perceived unfairness of housework allocations was only a significant predictor of ill health among those not in employment. Housework hours were not a significant predictor of limiting illness among any group.

Table 5.9: Hazards Ratios for limiting long-term illness 1992-2008 given housework hours and perceptions of housework fairness: people in employment and not in employment compared. BHPS.

	All				In employment				Not in employment			
	HR	p	95% CI		HR	p	95% CI		HR	p	95% CI	
			Lower	Upper			Lower	Upper			Lower	Upper
Men												
Age	1.03	0.000	1.03	1.04	1.02	0.000	1.01	1.04	0.98	0.000	0.98	0.99
Limiting illness 1991	5.57	0.000	5.11	6.06	6.94	0.000	5.97	8.08	2.63	0.000	2.37	2.92
Perceived unfair housework, 1992	0.94	0.020	0.89	0.99	0.90	0.036	0.82	0.99	0.90	0.002	0.85	0.96
Time varying covariates												
Hours of housework												
5-9 hours	1.01	0.052	1.00	1.02	1.01	0.317	0.99	1.03	1.01	0.252	0.99	1.02
10-19 hours	1.02	0.000	1.01	1.03	1.03	0.001	1.01	1.05	1.01	0.092	1.00	1.02
20+ hours	1.03	0.000	1.02	1.05	1.00	0.835	0.96	1.05	1.01	0.378	0.99	1.03
Women												
Age	1.04	0.000	1.03	1.04	1.03	0.000	1.02	1.04	1.00	0.220	1.00	1.01
Limiting illness 1991	4.13	0.000	3.84	4.43	5.83	0.000	5.12	6.65	2.74	0.000	2.52	2.98
Perceived unfair housework, 1992	1.02	0.278	0.98	1.07	0.94	0.107	0.87	1.01	1.08	0.003	1.02	1.13
Time varying covariates												
Hours of housework												
5-9 hours	0.99	0.263	0.97	1.01	0.98	0.369	0.95	1.02	1.00	0.875	0.97	1.02
10-19 hours	0.99	0.483	0.98	1.01	0.99	0.718	0.96	1.03	0.99	0.432	0.97	1.01
20+ hours	1.00	0.705	0.98	1.01	0.99	0.728	0.96	1.03	0.99	0.397	0.97	1.01

Source: British Household Panel Survey. Author's analysis.

Table 7.3 shows the results of a similar analysis, but using psychological distress (indicated by GHQ-12 caseness) as an outcome. The results were broadly similar. Housework hours were not a significant predictor of psychological health for any group examined. Men's perception of unfair housework allocations was related to better

health. Among women, perceptions of unfair housework significantly increased the risk of poor psychological distress, with the most pronounced effect being for non-employed women (OR = 1.17; 95% CI 1.11 -1.23).

Table 5.10: Hazards Ratios for psychological distress 1992-2008 given housework hours and perceptions of housework fairness: people in employment and not in employment compared. BHPS.

	All				In employment				Not in employment			
	HR	p	95% CI		HR	p	95% CI		HR	p	95% CI	
			Lower	Upper			Lower	Upper			Lower	Upper
Men												
Age	0.99	0.000	0.98	0.99	0.98	0.000	0.97	0.99	0.96	0.000	0.95	0.97
Psychological distress, 1991	1.51	0.000	1.39	1.65	2.03	0.000	1.82	2.26	1.11	0.002	1.04	1.18
Perceived unfair housework, 1992	0.96	0.100	0.91	1.01	0.99	0.773	0.93	1.06	0.84	0.000	0.77	0.92
Time varying covariates												
Hours of housework												
5-9 hours	1.00	0.648	0.99	1.01	1.00	0.725	0.99	1.02	0.99	0.367	0.97	1.01
10-19 hours	1.00	0.624	0.99	1.01	1.00	0.747	0.98	1.01	1.00	0.839	0.98	1.02
20+ hours	1.00	0.855	0.97	1.02	0.96	0.087	0.93	1.01	0.99	0.668	0.96	1.02
Women												
Age	0.99	0.019	0.99	1.00	1.00	0.375	0.99	1.00	0.98	0.000	0.97	0.98
Psychological distress, 1991	1.07	0.000	1.04	1.10	1.12	0.000	1.06	1.19	1.05	0.007	1.01	1.09
Perceived unfair housework, 1992	1.10	0.000	1.06	1.14	1.05	0.085	0.99	1.10	1.17	0.000	1.11	1.23
Time varying covariates												
Hours of housework												
5-9 hours	1.00	0.782	0.98	1.02	0.99	0.396	0.96	1.01	1.02	0.102	1.00	1.05
10-19 hours	1.01	0.312	0.99	1.03	1.01	0.247	0.99	1.04	1.00	0.874	0.98	1.03
20+ hours	1.00	0.549	0.99	1.02	1.00	0.844	0.98	1.02	1.00	0.793	0.98	1.03

Source: British Household Panel Survey. Author's analysis.

5.6. Discussion

In this chapter I aimed to investigate the relationship between different trajectories of labour market position and subsequent health, and to identify the degree to which such relationships vary by gender and health outcome using longitudinal data covering more than a decade. Despite some differences in results depending on the method used to describe labour market histories, these findings confirm the relative

health advantage conferred by stable employment that is evident in review level studies (van der Noordt et al., 2014) and the inequalities experienced by those permanently sick. Exposure to the permanently sick role is consistently associated with worse health across the outcome measures considered, for both men and women despite efforts to control for potential health selection effects.

There were however also some clear differences by gender and health outcome. Findings on the experience of women looking after the home were more mixed. When the more sophisticated latent class analysis approach was used, a group of women looking after the home and family was identified with relatively higher rates of limiting illness. In socio-economic terms, this group is also more disadvantaged. Analyses of mortality as an outcome were limited by a lack of statistical power, as there were few deaths in the sample. Variations by psychological distress were more mixed though, of note, I found that the cumulative number of times women were unemployed was associated with an increased risk of psychological distress.

This chapter has also been concerned with exploring the relationship between housework and health, and whether it varies by gender and health outcome. Gender differences were observed. Women spent considerably longer hours doing housework than men did. As hypothesized, women who felt that their housework allocations were unfair reported worse health but men in this position had a reduced risk of illness or psychological distress. Housework hours were not a significant predictor of health for either men or women, perhaps because there is not much within-gender variation in experiences.

There are however some limitations to these investigations. The sample used was relatively small and meant that some investigations had to be done on a pragmatic basis, for example by only distinguishing people in employment and those not in employment. While the BHPS includes a degree of information about housework these indicative findings suggest that more sophisticated questions to enable understanding of individual beliefs and psychological processes are likely to be more fruitful for health

research. We shall turn to the issues related to fuller conceptualization of informal work in Chapter 8.

This chapter started with the reflection that some households have the capacity to buy in domestic labour. The presence of domestic helpers such as a cleaner may well affect the observed relationships but could not be measured. Likewise perceptions of household allocations were only measured at single point in time in the present analysis to enable a long follow-up period to examine health status. However, such perceptions might be expected to vary considerably perhaps even on daily basis.

Trade-off between richness and parsimony

The exploratory approach used for the investigations in this chapter has attempted to enable parsimonious description of trajectories, while also enabling the richness of the histories to be seen. This is challenging. The varied labour market experiences that have been presented are influenced by policy changes to the labour market described in Chapter 1, and the health selective mobility between groups explored in Chapter 2, both of which may affect the observed trajectories. For example, over the period 1991-2001 it is possible that there was an unusual period effect in the labour market distribution as policies focused on managing the unemployment rate while giving less attention to the rising numbers permanently sick (Beatty and Fothergill, 2005). Such contextual issues may be unique to the cohort examined in this study as policies increasingly focus on getting all non-employed groups into work.

More complex joint state modelling of health and labour market and other trajectories would be possible, but in such cases there is arguably a trade off between methods that attempt to summarise the full richness of longitudinal exposures, and the interpretability of findings. Considering trajectories as the number of times an individual was exposed to a particular position is a simple, interpretable method, which confirmed the cross-sectional relationship between labour market position and health seen in Chapter 4. The approach also provides further evidence of the health effects of accumulated exposures. On the other hand, merely counting the frequency of exposure

to a group does not adequately capture the issue of mobility between groups. The latent class analysis approach was useful in this regard and revealed some important differences, particularly the experiences of the long-term non-employed group which appears to reflect general labour market disadvantage in the way described by Bartley and Plewis (2002) though the results are exploratory.

5.7. Conclusion

Stable careers in employment are associated with better physical and mental health, while long-term exposure to the permanently sick role, appears to be particularly deleterious for health. Women and men occupied by non-employed positions over the long-term also face an increased risk of limiting illness. These findings are unlikely to be accounted for fully by health selection effects and add further weight to literature, which highlights the damaging health effects of worklessness. Labour market position is however, only one lens through which to consider the issue of health and work. Findings on the relationship between time spent on domestic work and health support a recurring theme in the literature – that the way people feel about specific work activities is more important for health than the amount of time or effort they expend on it. I found that women who felt that their housework allocations were unfair reported worse health. This is a relevant issue for the next chapter, where I turn to the relationship between labour market position, informal caring roles and health.

6. Informal care giving and paid employment: health precursors and health outcomes

Population ageing in industrialised countries has sparked public debate about the balance of care provision for older people between the state and individuals. There is correspondingly, growing research interest in provision of informal care for people who are sick or disabled, particularly among older people. What is less clear, however, are the longer-term health and social consequences of informal care giving. If the consequence of caring work is a higher incidence of poverty and health problems among carers, over-reliance on care for elders within families may be ill founded and have a net cost to society. This chapter looks at work through the lens of informal care giving and paid employment examining the effects of informal caregiving on mortality. It answers the following questions: At ages 50-64, what is the distribution of combinations of informal caring and labour market position? 2) Is there health selection into these combinations? 3) What are the health associations and health sequelae of these combinations, taking account of any health selection?

6.1. Background

While there are informal carers among people of all age groups, the prevalence of care giving is highest in middle age, with women more likely to be carers than men (Dahlberg et al., 2007). Many of those providing care in middle age are likely to face other calls on their time such as parenting and paid employment (Evandrou and Glaser, 2003). Care provision is known to be associated with non-participation in the labour market, which may be due to care giving prompting labour market withdrawal or because those not in employment are more likely be carers (Heitmueller and Inglis,

2007). Census data for England and Wales show that the proportion of carers in employment falls as the numbers of hours of care provision rises (Arksey et al., 2005). Similarly, a recent study of Australian women in their 50s found that take-up of care giving was associated with a decrease in or exit from paid employment, despite the transition to care giving being unrelated to the time women had spent in employment (Berecki-Gisolf et al., 2008). However there are gender differences in the labour market participation of carers. A British study of adult carers aged 16 to 69 found that women who were care-givers were almost twice as likely to leave paid employment as men (Henz, 2004). Young and Grundy (2008) found that never married people with weaker labour market ties over their adult life course were more likely to be care givers in midlife, but this difference was less pronounced among men than women.. Cross-sectionally carers are more likely to report poor general health. It is anticipated that this is in part due to people with poor health being more likely to take up caring roles. It is therefore hypothesised that informal care-givers are a socially select group, more likely to be those who were not previously in employment and who reported worse health.

The decision that many carers take to leave paid work or reduce their hours of employment may have long lasting financial penalties. Evandrou and Glaser (2003) found that carers who gave up employment to provide care would be more likely to have lower income levels in later life because they tended to have fewer years of pension contributions and were less likely to be members of pension schemes. Similarly, the opportunity costs of care provision, in terms of earnings forgone and setbacks to earnings when carers re-enter employment or increase hours of employment have been found to be substantial (Heitmueller and Inglis, 2007).

If we assume that combining employment and care giving requires a certain degree of fitness and resilience, that people in employment have better health than those in other labour market positions, and that human capacity to combine roles is expandable, it might be expected that people who combine paid employment and informal caring will have lower mortality compared with those in other labour market positions who provide informal care such as housewives. Thus, I hypothesize that while

the overall mortality of carers will be lower, this effect will be more pronounced among people who combine paid employment and care giving.

6.2. Method

This chapter is based on analysis of the ONS Longitudinal Study (ONS-LS) of England and Wales. The selected sample is people who were aged 50-64 years at the 2001 Census – around the average retirement age of 63 for men and 60 for women in the UK around the time of the census (Office for National Statistics, 2009)– who were also present at the 1991 Census. In addition, the sample is limited to people who were traced in the NHS Central Register (97 per cent), the main system used for record linkage in the study. For those not traced, exits from the study between censuses are less likely to be recorded which could generate biases in the population at risk when analysing mortality. The selected sample includes 74,711 people: 38,556 women and 36,155 men.

Measures

The measure of care giving comes from the 2001 Census question on provision of unpaid care with the following categories: none, 1-19 hours; 20-49 hours and 50+ hours per week. Labour market position was considered with indicator comprising seven categories. People not in paid employment are categorised to one of five groups: unemployed, retired, permanently sick, looking after the home or family, others economically inactive. For those in paid employment or self-employment a distinction was made between those working full time and those working part time. To enable statistical analysis relating labour market position to health, in some cases, the full time and part time employed groups had to be combined owing to small samples. To adjust for socio-economic differences between groups, I use the Registrar General's social class based on occupation aggregated into social classes I-IIIN (non-manual) and IIIM-V (manual), and housing tenure to make up for the deficiencies of social class as an indicator of socio-economic position among people who have been out of work for some time and women in general. As health is associated with marital status, I adjust also for

marital status in statistical models. The locus of care may also affect relationships between caring work and health. Proxy variables were derived to indicate whether care took place within the household (locus of care) by identifying whether individuals in the sample were living with a parent, child or partner who had a limiting long-term illness. Two indicators of subjective morbidity collected at the Census were used: limiting long-term illness (LLTI) and self-rated general health. The final health measure used in this study is mortality occurring between 2002 and 2009 inclusive.

Statistical analyses

I first examine the distribution of our sample by caring status and full time using descriptive statistics. Ordered logistic regression models on being a carer at the 2001 Census given health and social characteristics at the 1991 is used to explore whether carers are a select, unhealthier group. To address the question of whether care giving is associated with poor health, I examine the association between care giving and subsequent mortality in the period 2002-2009 using Cox proportional hazards models, taking into account any known exits from the population at risk during the study period. For each labour market position, the average effect of caring on mortality risk is examined using conditional marginal effects, estimated from the results of Cox models, assuming a given set of other characteristics included in the models. This approach allows us to address the question of how the relationship between care giving and health differs by labour market position.

All analyses are performed separately for men and women. Models on mortality include adjustments for factors expected to be related to care-givers subsequent health including age, social class, housing tenure, marital status, general health status, limiting long-term illness, whether living alone, and whether living with a relative who had a limiting long-term illness in 2001, a proxy for locus of care. In some cases, it was necessary to combine categories, which had small sample sizes.

6.3. Distribution of care giving and employment

In the sample of people aged 50-64, 24 per cent of women and 19 per cent of men reported that they were care givers at the 2001 Census. Most care givers reported spending 1-19 hours providing care in a typical week; around 5 per cent of men and 7 per cent of women provided 20 or more hours care per week (Table 7.1). Those providing longer hours of care were more likely to live with a relative who reported having a limiting long-term illness.

In line with previous studies, there was an inverse relationship between the likelihood of a carer being in employment and the amount of time spent caring. For example, among men, 74 per cent of those caring for 1-19 hours per week were in paid employment compared with 39 per cent of those caring 50 or more hours. Non-carers were slightly less likely to be in paid employment than those caring for 1-19 hours a week among both men and women. Likewise, the proportion of carers in non-manual social classes declined with the amount of time spent caring (not shown), but non-carers were less likely to be in non-manual social classes than those caring for 1-19 hours a week. In sum, those caring for 1-19 hours per week were more likely to be in advantaged social positions and to be in employment than other groups.

Considering the prevalence of caring by labour market position shows that care giving is more common among women than men, in all groups apart from those looking after the home or family. Caring was much more common among people looking after the home than in other groups particularly among men. Men looking after the home or family were considerably more likely to be spend long hours providing care of 20+ hours per week (56 per cent) than men in other labour market positions (5 per cent for all groups). Women looking after the home were also much more likely to care for 50+ hours per week (11.6 per cent) than their peers (5 per cent for all groups).

Table 6.1: Distribution of sample by labour market position, care giving status and gender

Gender and labour market position	Hours of informal care in a typical week					All groups
	No care	1-19 hours	20-49 hours	50+ hours	Any care	
Column %						
Women						
In paid employment	53.2	60.0	42.0	30.0	52.1	52.9
Employed full time	23.7	24.8	19.6	10.3	21.4	23.2
Employed part time	24.1	28.0	18.3	16.3	24.7	24.2
Self-employed	5.4	7.2	4.0	3.5	6.1	5.5
Unemployed	1.2	1.1	0.8	0.8	1.0	1.2
Retired	22.9	20.3	23.5	27.0	21.9	22.7
Permanently sick	9.5	4.0	9.4	10.9	6.0	8.7
Looking after the home/family	9.3	12.7	21.3	28.1	16.6	11.1
Other economically inactive	3.8	2.0	3.0	3.2	2.3	3.5
All groups	100.0	100.0	100.0	100.0	100.0	100.0
N	29,331	6,382	1,075	1,768	9,225	38,556
Deaths	2,191	254	52	96	402	2,593
Men						
In paid employment	69.9	74.1	58.3	38.5	67.2	69.4
Employed full time	47.8	49.4	39.2	24.9	44.7	47.2
Employed part time	4.3	5.6	4.8	4.1	5.3	4.5
Self-employed	17.8	19.1	14.4	9.6	17.2	17.7
Unemployed	3.0	2.9	3.5	2.1	2.8	2.9
Retired	11.0	13.5	12.9	16.3	13.9	11.5
Permanently sick	13.0	7.2	14.5	26.6	10.9	12.6
Looking after the home/family	0.4	0.5	8.5	13.8	3.3	1.0
Other economically inactive	2.7	1.8	2.1	2.7	2.0	2.6
All groups	100.0	100.0	100.0	100.0	100.0	100.0
N	29,402	5,128	564	1,061	6,753	36,155
Deaths	1653	201	35	97	333	1,986
Row %						
Women						
In paid employment	76.4	18.8	2.2	2.6	23.6	100.0
Employed full time	77.9	17.7	2.4	2.0	22.1	100.0
Employed part time	75.7	19.1	2.1	3.1	24.3	100.0
Self-employed	73.7	21.4	2.0	2.9	26.3	100.0
Unemployed	79.7	15.2	2.0	3.1	20.3	100.0
Retired	76.8	14.8	2.9	5.5	23.2	100.0
Permanently sick	83.5	7.7	3.0	5.8	16.5	100.0
Looking after the home/family	64.1	18.9	5.4	11.6	35.9	100.0
Other economically inactive	84.0	9.4	2.4	4.2	16.0	100.0
All groups	76.1	16.6	2.8	4.6	23.9	100.0
Men						
In paid employment	81.9	15.1	1.3	1.6	18.1	100.0
Employed full time	82.3	14.8	1.3	1.5	17.7	100.0
Employed part time	77.9	17.8	1.7	2.7	22.1	100.0
Self-employed	81.9	15.3	1.3	1.6	18.1	100.0
Unemployed	82.1	14.0	1.9	2.1	17.9	100.0
Retired	77.4	16.7	1.8	4.2	22.6	100.0
Permanently sick	83.9	8.1	1.8	6.2	16.1	100.0
Looking after the home/family	37.0	7.7	13.7	41.6	63.0	100.0
Other economically inactive	85.8	9.9	1.3	3.1	14.2	100.0
All groups	81.3	14.2	1.6	2.9	18.7	100.0

Source: ONS Longitudinal Study. Author's analysis

6.4. Prior health, labour market and social circumstances of informal carers

To give an indication of the extent to which carers are a select group, Table 7.2 shows the results of ordered logistic regression models on the odds of being a carer in 2001 given individual characteristics in 1991. The findings suggest that carers are a somewhat select group. Relative to being in paid in employment in 1991, being out of work due to permanent sickness was associated with decreased odds of subsequent caring, and being out of work to look after the home or family with higher odds of caring. People in more advantaged socio-economic positions – living in owner-occupied housing or from non-manual social classes – and those who were married in 1991, had a higher likelihood of being an informal caregiver in 2001. Considering the prior health of carers, men who had a limiting long-term illness in 1991 had higher odds of care giving in 2001 (the result for women was similar but not statistically significant). When limiting long-term illness and health status in 2001, contemporaneous to caring status, were included in models the effect of prior limiting long-term illness was attenuated and some differences in likelihood of caring by contemporaneous health status emerged. People with limiting long-term illnesses in 2001, had higher odds of also being an informal carer. Likewise those who reported ‘fairly good’ as opposed to ‘good’ health had a raised likelihood of caring. However for women in ‘not good’ health the odds of care giving were lower. The relationship between general health and caring is not, therefore, linear: people with chronic illness or disabilities who perceive that their general health is fair are more likely to be mid life carers.

Table 6.2: Odds ratios (OR) for informal care giving in 2001 given personal characteristics in 1991: ordered logistic regression

	Base model, 1991 characteristics		+ health status and LLTI in 2001	
	Men	Women	Men	Women
	OR	OR	OR	OR
Age, 1991	1.00	0.99***	1.00	0.98***
Had a limiting long-term illness, 1991	1.22**	1.06	1.12	1.03
Employment status (reference: in paid employment)				
Unemployed	0.99	0.89	0.97	0.89
Retired	1.1	0.78	1.09	0.78
Permanently sick	0.75**	0.69***	0.75**	0.71***
Looking after home/family	2.04***	1.25***	2.00***	1.24***
Others inactive	1.1	0.83	1.11	0.83
Housing tenure, 1991 (reference: owner-occupied)				
Social housing	0.87**	0.90**	0.86**	0.89**
Other rented	0.77***	0.94	0.77***	0.93
Social class, 1991 (reference: non-manual)				
Manual	0.82***	0.81***	0.80***	0.81***
Unclassified	0.84*	0.85***	0.83*	0.84***
Marital status (reference: married)				
Single	1.09	0.96	1.08	0.96
Divorced	0.86**	0.80***	0.86**	0.80***
Widowed	0.54**	0.64***	0.54**	0.64***
Had limiting long-term illness, 2001			1.15***	1.10**
Self rated health, 2001 (reference: Good)				
Fairly good			1.19***	1.19***
Not good			1.00	0.85***
Constants				
1-19 hours care	3.51***	1.44**	3.26***	1.39*
20-49 hours care	17.20***	5.72***	16.00***	5.55***
50+ hours care	26.76***	9.48***	24.91***	9.19***
chi2	140.23	280.29	196.49	366.59
Ll	-22114.7	-28657.48	-22086.57	-28614.33
df_m	14	14	17	17
P	0	0	0	0

Source: ONS Longitudinal Study. Author's analysis
Statistical significance: *** p < 0.001; **p < 0.01; * p<0.05.

6.5. Associations of care giving and employment with mortality

What of the sequelae of caring and paid employment? Table 7.3 presents the results of Cox regression models on mortality given individual and household characteristics including caring status and labour market position. It shows that men and women who were caring for 1-19 hours per week at the 2001 Census, and women who were caring for 20-49 hours per week had a lower risk of mortality in the following nine years even after adjustments for socio-demographic factors and health status at 2001. I also examined the effects of living with an ill relative on subsequent mortality risk, to provide a proxy for the locus of care. Living with an ill parent was associated with an increased risk of mortality (though this was not statistically significant for women).

Among men, being out of work due to retirement, permanent sickness or economic inactivity apart from looking after the home or family was associated with an increased risk of mortality; for women, a similar pattern was observed, but the only statistically significant effect was for those permanently sick. Estimation of the marginal effects of caring status on mortality risk conditional on labour market position illustrates that degree of association between caring and mortality varies by labour market position. For example, the lower risk of mortality associated with caring for 1-19 hours per week is more pronounced for people out of work, particularly permanently sick people. Likewise, the lower mortality risk associated with caring for 50+ hours per week is especially amplified among retired people, and those permanently sick (Table 7.4).

Table 6.3: Hazard ratios (HRs) and 95% confidence intervals (95% CI) for mortality by care giving status and labour market position

	Men			Women			
	HR	95% CI		HR	95% CI		
		Lower	Upper		Lower	Upper	
Hours caring per week (ref: none)							
1-19 hours	0.80 **	0.70	0.92	0.72 ***	0.62	0.83	
20-49 hours	1.12	0.85	1.49	0.57 **	0.41	0.80	
50+ hours	0.89	0.71	1.11	0.88	0.71	1.10	
Labour market position (ref: in paid work)							
Unemployed	1.21	0.97	1.49	1.34	0.89	2.01	
Retired	1.17 *	1.04	1.33	1.04	0.91	1.19	
Permanently sick	1.33 ***	1.16	1.51	1.51 ***	1.29	1.77	
Looking after home/family	0.86	0.56	1.31	1.18	1.00	1.40	
Others inactive	1.29 *	1.06	1.59	1.19	0.95	1.49	
Age	1.09 ***	1.07	1.10	1.11 ***	1.09	1.12	
Limiting long term illness	1.25 ***	1.11	1.41	1.22 **	1.07	1.39	
Self rated health, 2001 (ref: Good)							
Fairly good	1.38 ***	1.25	1.53	1.26 ***	1.13	1.42	
Not good	2.02 ***	1.77	2.31	2.21 ***	1.90	2.58	
Housing tenure (ref: owner-occupied)							
Social housing	1.75 ***	1.58	1.94	1.46 ***	1.30	1.64	
Other rented	1.35 ***	1.14	1.59	1.22 *	1.00	1.49	
Social class (ref: non-manual)							
Manual	1.10 *	1.01	1.20	1.06	0.96	1.17	
Unclassified	1.34 ***	1.13	1.57	1.46 ***	1.27	1.68	
Marital status (ref: married)							
Single	1.38 ***	1.18	1.63	1.52 ***	1.24	1.86	
Divorced	1.21 *	1.04	1.40	1.09	0.94	1.28	
Widowed	1.51 ***	1.22	1.86	1.31 **	1.11	1.55	
Living with an ill parent	1.41 *	1.07	1.86	1.21	0.83	1.76	
Living with an ill partner	0.95	0.86	1.06	0.91	0.80	1.02	
Living with and ill child	0.80	0.63	1.01	0.97	0.76	1.25	
Living alone	1.05	0.91	1.21	1.02	0.88	1.18	

Source: ONS Longitudinal Study. Author's analysis

Statistical significance: *** p < 0.001; **p < 0.01; * p<0.05.

Table 6.4: Marginal effects of caring conditional on labour market position: proportional hazard model

	Men	Women
Caring 1-19 hours		
In work	-25.06	-88.73
Unemployed	-42.94	-143.04
Retired	-46.06	-199.78
Permanently sick	-91.61	-339.19
Looking after home or family	-32.43	-119.23
Other inactive	-58.51	-178.24
Caring 20-49 hours		
In work	15.96	-133.83
Unemployed	27.33	-215.73
Retired	29.32	-301.3
Permanently sick	58.32	-511.56
Looking after home or family	20.64	-179.82
Other inactive	37.25	-268.82
Caring 50+ hours		
In work	-13.73	-36.55
Unemployed	-23.52	-58.91
Retired	-25.24	-82.28
Permanently sick	-50.19	-139.7
Looking after home or family	-17.77	-49.11
Other inactive	-32.06	-73.41

Source: ONS Longitudinal Study. Author's analysis

6.6. Discussion

In this study I aimed to address three research questions: 1) *At ages 50-64, what is the distribution of combinations of informal caring and labour market position?* In addressing the first question, I found an inverse relationship between the likelihood of a carer being in employment and the amount of time spent caring. Caring was most common among people who reported looking after the home or family in 2001. 2) *Is there health selection into these combinations?* I hypothesised that informal carers are select group comprising people who report people who report poor health. I found some

indications that informal carers in 2001 were selected for poor health, as they were more likely to have reported a limiting long-term illness in 1991. However, in contrast, informal carers in 2001 were less likely to have previously been in the permanently sick labour market position in 1991, suggesting that carers are people who have some fitness for work despite any illness or disability. 3) *What are the health sequelae of these combinations taking account of any health selection?* Light to moderate amounts of care provision, up to 20 hours per week, were found to be associated with a lower risk of subsequent mortality after adjustments for socio-demographic factors and health status. This association is more pronounced among people who are out of employment. This confirmed my hypothesis of lower risk of mortality among informal carers being more pronounced among people who combine paid employment and informal care giving.

This study provides one of the first opportunities to look at the health of a large sample of carers in the UK. I found that carers involved in light to moderate amounts of care have a lower risk of mortality despite indications that are selected for poorer health; this effect is amplified among groups out of employment particularly the permanently sick. Paradoxically, though we might expect carers' health to decline with heavier caring workloads I found no such evidence.

The apparent longevity benefit associated with caring among people who are out of work underlines the importance of considering caring as a socially productive activity. Given that adjustments were made for the socio-economic position of carers and therefore, to some degree, the means to draw on additional support in providing care, the results presented suggest that we should not overlook the potential for caring to be a positive and life enhancing experience which can be beneficial to health as well as quality of life in circumstances of effort-reward balance. I attempted to examine this issue by considering the locus of care, indicated as living with a relative (parent, partner or child) who had a limiting long-term illness. For men, living with an ill parent was associated with a raised risk of mortality. The average age of ill parents was 82 years among the sample, and more than two-thirds of men living with ill parents were care givers, typically providing care for more than 20 hours per week. It is therefore likely

that many sample members residing with ill parents were caring for parents who had diseases of old age. On the one hand, it might be expected that the indicator of ill parent serves as a fair proxy of being a care recipient within a household. If we assume that living with an ill parent indicates provision of higher amounts of higher intensity care, the finding that this is associated with an increased risk of mortality among men is consistent with work by Schulz and Beach (1999) who found that carers who report role strain had a higher risk of mortality. However, on the other hand, similar deleterious effects of residing with an ill child or ill partner for mortality risk were not found and therefore cast some doubt on the validity of proxy measures on the locus of care, or intensity of care provision.

The finding that caring is associated with a lower risk of mortality among those out of employment may be due to health selection effects. I attempted to examine selection into the caring role by examining odds of being a carer in 2001 by prior LLTI and other personal characteristics. This analysis suggested that male carers are selected for poorer health, but also indicated that carers identified in the census are a relatively advantaged group more generally. As some people who provide informal care may not identify their caring activities as such because they have never considered or labelled the day-to-day support they give to friends or relatives, it is possible that the census question misses a group of potentially more disadvantaged carers. Other limitations of the caring measure include a lack of information about: the relationship of care recipient to the carer, the health of person being cared for, the frequency of care, its location or the length of a caring relationship, all of which have been shown to be associated with carers' health (Hirst, 2002, Pinguart and Sörensen, 2007).

The measures of health used in this study also have drawbacks. Limiting long-term illness and self-rated health are global measures of disability and general health respectively, but do not allow exploration of any causal pathways between caring and health. For example, musculoskeletal conditions may be acquired due to lifting and carrying in a caring role (Brown and Mulley, 1997); likewise symptoms of psychological distress may be developed particularly when care giving is for intense periods without

respite (Jones and Vetter, 1984).

6.7. Conclusion

Mid-life carers appear to be a relatively physically healthy population and the longevity associated with caring is more pronounced among people not in paid employment. This evidence is based on a large-scale representative study, which provides a good indication of population health, broadly measured. The potential for caring to be beneficial for health and quality of life – particularly in circumstances of effort-reward balance where there is a degree of reciprocity on the caring relationship – should therefore not be overlooked.

7. Discussion

The major aim of this thesis has been to understand the relationship between different forms of work and health and how such relationships vary over time, by gender and for different social groups. It has aimed to shine different lights on the issue empirically and conceptually to enable reflections on the concept of total work to be made. This chapter briefly summarises the principal findings of the study in light of existing literature, and describes the strengths and limitations of the approach used. A key original aspect of this research is the focus on historical trends in mortality by labour market position at older ages, which has not previously been undertaken with the ONS-LS. In addition, the data have been exploited by focusing on a period of the life course, around early old age, that is arguably under-researched in relation to work. I then reflect on some of the theoretical and methodological issues concerned with developing a deeper understanding of the pathways between work and health.

7.1. Principal findings

This thesis aimed to answer four main research questions. The findings related to each question are discussed in turn and in relation to the initial hypotheses described in Chapter 3.

1. Trends in labour market position and health. *How does labour market position around State Pension age affect subsequent health? Does the effect vary over time, by cohort, gender and health outcome?*

The results presented in Chapter 4 show that there is an association between labour market position and health, which is persistent across time, and different health outcomes. I have demonstrated that, despite improvements in longevity seen since the 1970s, not all groups have shared equally in these positive changes. I found that people in employment in the decade of life preceding the State Pension age have the lowest risk of mortality – with relative risk around a third lower for men and up to 40 per cent

lower among women compared with people in other labour market positions. The highest risk of death was observed among people not in employment due to permanent sickness. In 1991 and 200, higher rates of mortality were also seen among unemployed men and women relative to those employed. It was anticipated that the relative mortality of unemployed people would be lower in the recessionary periods covered by the study (1981 and 1991) as job loss would be experienced by a wider population and not so heavily influenced by social selection but this was not observed. In the earlier censuses covered (1971 and 1981), the mortality risk of unemployed people was not significantly different from employed people, but this did not correspond directly with recessionary periods.

The relative numbers of people who were in the permanently sick role also grew considerably and, as policy changes are purported to be a reason for this growth, might be expected to include greater numbers who were less seriously ill than was previously the case. Therefore, It was hypothesised that the mortality of permanently sick people would improve over time, relative to employed people. However, we saw in Chapter 4 that successive cohorts of people in the permanently sick role did not experience reductions in their mortality risk relative to other groups indicating that causal processes may be at play as much as health selection into the group. The permanently sick group experienced *absolute* improvements in longevity, but their relative risk of mortality was persistently low. The findings presented here, therefore suggest that growth in the permanent sick group has not necessarily resulted in recipients being less seriously ill than was previously the case. Or, more specifically, the degree of ill health or disability among the permanently sickness has not declined relatively to the employed population.

For women increases in employment and labour market participation were seen over the three decades up 2001. However, with this increasing attachment to paid employment, there was an increase in the relative ill health and mortality of women who were unemployed or inactive and looking their homes and families. It was hypothesised that housewives would have an increased risk of poor health and mortality compared

with employed women and this was confirmed across the four cohorts although the potential for health selection effects cannot be ruled out entirely. Compared with existing literature, these findings are consistent with the principal issues identified in review level studies of unemployment and health and mirror the raised mortality risk among people who are not in paid employment that has been observed in previous studies based on the ONS-LS (Moser et al., 1984, Moser et al., 1986, Moser et al., 1987).

2. Labour market trajectories and health. *How are different trajectories of labour market position associated with health in later life? Do associations vary by gender and health outcome?*

In Chapter 5 we found that stable careers in employment are associated with better mental health and lower likelihoods of limiting illness, confirming the hypothesised cumulative advantages associated with paid employment. More years unemployed were associated with an increased risk of limiting illness for men and women, and psychiatric morbidity among women. However, occupying a role looking after the home or family generally did not have significant effects on risks of ill health.

It was hypothesised that exposure to the permanent sick role would be more long lasting than other non-employment roles and associated with the greatest health risk of all. This was confirmed. Though a relatively small group in absolute terms (just 3 per cent of the BHPS sample in 1991) 50 per cent of men, and 29 per cent of women who were permanently sick in 1991 remained in that group throughout the period 1991-2001. More cumulative years in the permanently sick role significantly increased the risk of limiting illness and psychiatric morbidity among both men and women. These effects were more pronounced when considering people classified to the labour market trajectory group where long-term sickness was a common feature, using exploratory latent class analysis methods. In Chapter 4, we saw that cross-sectional exposure to permanent sickness significantly increased the risk of subsequent ill-health or mortality. This finding was reinforced when long-term exposure to the permanently sick role was considered in Chapter 5, and appeared to be particularly deleterious for health.

3. Domestic work, labour market position and health. *What is the relationship between domestic work and health and how does it vary by labour market position? To what degree do differences in individual perceptions of workloads underpin such relationships?*

Findings on the relationship between informal work roles and health indicate the importance of individuals' evaluations of their position - both choice and constraints on activities - as important aspects of the psychosocial pathway between different forms of work and health. In Chapter 5, I found that women who perceived their housework allocations to be unfair reported worse health, while the number of hours spent doing housework was not a significant influence on health. This finding is consistent with the results of other studies on domestic work and health (Hagqvist et al., 2012, Harryson et al., 2012) and broadly confirmed my hypothesis that perceptions about domestic work roles are stronger predictors of subsequent health than the amount of time spent on housework. Thus it is unlikely that combining different work and other roles is damaging.

4. Informal caring, paid employment and health. *Is the combination of informal caring and paid employment detrimental for health?*

I found that mid-life carers appear to be a relatively physically healthy population with lower mortality on average than non-carers. In Chapter 6, I found that, while carers are selected for poorer general health (in line with my hypothesis), they were less likely to have previously been in a permanently sick role suggesting the need for certain level of capacity or fitness in order to assume the caring role. Lower general mortality was observed among carers who, despite having higher rates of chronic illness, appeared to perceive fair health in general. These findings were consistent with the most comparable existing study of the mortality of carers (O'Reilly et al., 2008). Additionally, the combination of paid employment and caring did not seem to be damaging for health. This confirmed my hypothesis that the risk of mortality among informal carers would be

lower than non-carers in general, and that this effect would be more pronounced among people who combine paid employment and informal care giving.

In sum, throughout this thesis, the relatively advantaged position of people in employment has been demonstrated using a range of new analyses, and the persistent relative health disadvantage of people in the permanently sick group revealed. This was the case across time periods spanned by the ONS-LS and with different health measures studied in the both the ONS-LS and BHPS.

7.2. Strengths and limitations

Strengths

A key strength of the study lies in innovative use of two complementary large-scale longitudinal studies, which support robust analysis of the phenomena in question. The sheer size of the ONS-LS enables a great deal of statistical precision. The focus on historical trends in mortality by labour market position at older ages has not previously been undertaken with the ONS-LS, and the data have been exploited by focusing on a period of the life course that is arguably under-researched in relation to work in the years around the State Pension age. With its inception in 1991, the BHPS is mature enough to look at trajectories of labour market experience from mid-life through to early old age, with annual observations for a range of birth cohorts. This method has helped to enrich the findings from the very powerful ONS-LS data. The general consistency of findings between the two studies gives a degree of confidence in the findings and are an application of integrated analysis of the two studies that has been proposed to maximize their respective strengths (Office for National Statistics, 1999). Methodologically, a valuable technique, latent class analysis, was used to explore trajectories of experience, which generated useful insights on common experiences of labour market position.

The focus on gender differences, which runs throughout this thesis, is another asset. One limitation of previous literature has been a tendency to focus solely on women when investigating non-market roles and to give greater attention to men in

studies of formal employment. This study has indicated both similarities and differences between men and women's experience. For example, we have seen that over time women have become more likely to describe themselves as retired in later life, and that the relative mortality of the retired group is broadly similar among men and women.

Limitations

In the focus on labour market position and the influence of different forms of work on health, the influence of the nature of work roles has not been investigated. Apart from the negative effects of temporary or insecure employment that were discussed in Chapter 2, it is known that the psychosocial work environment is an important influence on the mental health of employees (Stansfeld and Candy, 2006). However, it was not possible to investigate this issue with the datasets used. The consideration of informal work was limited by a lack of thorough measurement of such activity in the ONS-LS Census records and BHPS but this is not unique to these studies, and discussed in more detail in the next section.

While efforts were made to account for potential health selection effects, it is likely that such effects were not fully accounted for in the approaches used. As shown in Chapter 2, both health selection and social causation are likely to affect the phenomena in question. While an attempt to understand the relative importance of each type of process can be useful for informing intervention, attempting to rule out one or the other type of explanation is arguably misguided.

Several statistical health measures were used in this study but they all have limitations and each one alone cannot give a total picture of health. The use of a variety of health measures was intended to corroborate findings. Some differences were found according to the health measures used – for example psychological distress was more weakly linked with labour market trajectories than limiting illness. However, the lived experience of ill health among people in particular roles, such as permanent sickness cannot be explored with such statistical investigations.

7.3. Theoretical and methodological considerations

It has been observed that not all work roles are equally desirable for an individual (Bird and Fremont, 1991). Good theoretically based measures are required to further understanding of the relationship between work and health. A key challenge for this study was lack of data available to operationalize informal work. Other researchers have also identified this lack of information in large-scale studies as a key area for development (Artazcoz et al., 2007). While some attention is given to work preferences in surveys, more attention might be given to developing better psychologically informed measures to understand how people feel about their position in certain roles. For example the two major theoretical models used to describe psychosocial work environments, the Job Demands and Control model (Karasek, 1979) and the Effort-Reward Imbalance (Siegrist, 1996) model might be more fully explored in relation to non-market work. There has been a modest attempt to operationalize the demands control model in the domestic setting based on a single questions about perceived control (Chandola et al., 2004). Where the Effort Reward Imbalance model has been applied to the issue of socially productive activities, it has been an important means of understanding pathways to health (Wahrendorf et al., 2006). A fuller exposition of the psychosocial domestic setting, however, would require detailed theoretical and methodological work to develop and pilot question sets for use in survey and other studies.

More careful attention to understand how social context manifests biologically as health also requires more careful consideration of the psychological processes that may operate when people occupy particular positions. For example, Bandura's concept of self-efficacy (Bandura, 2006) – or belief in capability to execute a particular task – may be particularly fruitful for understanding the causal effects of non-employed roles, particularly the permanently sick role. Among those permanently sick, administrative processes that require a focus on functional limitations may reinforce negative health beliefs. This may in turn erode people's self-efficacy for a range of activity so reducing capacities for social participation and compounding the chronic ill health already

experienced by the permanently sick group. It has been argued that:

...a psychosocial environment that offers options of experiencing self-efficacy produces favourable effects on health and well being whereas opposite effects are expected in individuals who are confined to a restrictive, control-limiting psychosocial environments, (Siegrist and Marmot, 2004)

Another area where greater theoretically informed investigations may be fruitful is the study of paid domestic labour. It is known that many people draw on domestic help to run their households and there has been some work done to theorise this activity (Crompton, 2006). This finds that there is a spectrum of care work related to the domestic sphere, from market work or 'marketised care' provided by state supported or profit-making suppliers, through to live-in household work. Any attempts to investigate paid domestic labour therefore also warrant careful operationalization of the concept of the domestic labour.

7.4. Summary

This thesis has found persistent health inequalities between people in employment in mid-life and those in non-employed positions. While there are some variations according to health measure and methodological approach, this finding is generally consistent. The particularly disadvantaged position of permanently sick people has been illustrated. Despite some technical limitations, the large-scale data sources, historical trends and longitudinal view on labour market trajectories that have been charted, give confidence in the relationships observed. A key technical limitation of the work however, relates to the lack theoretically informed measures available to investigate pathways between informal work roles and health. More detailed theoretical and methodological studies are required to address the gaps identified.

8. Conclusion

In this thesis, we have seen the persistent structuring of health outcomes according to labour market position for both men and women. Experiences of non-market work are associated with health but an individual's position in relation to paid employment appears to be a more important health determinant. Experiences of other work roles cast light and shade on this relationship between employment and health but do not seem to affect it fundamentally. As a society, conscious choices might be made about how to organise total labour efforts and the distribution of labour between formal employment and non-market work. Many policy levers exist to shape this distribution. Considering the public health implications of particular labour market and non-market roles can inform decision-making. In this conclusion, I reflect on some of the social and policy implications of this thesis given the background of significant social change described in the first chapter of this report.

8.1. Policy implications

At a general level, the findings of this thesis suggest a need for more focused attention on measures to enable secure, stable employment among those able to participate in the labour market. In parallel, interventions are needed to mitigate the deleterious effects of non-employment among those for whom labour market participation is unsuitable.

More specifically, the policy response requires a greater focus on gender differences in labour market position over the life course. Considering those out of employment, the normative experiences of men and women are different, with women being more likely to adopt the role looking after the home or family over their lives, and men to be permanently sick or jobseekers. Ill health associated with looking after the home or family might be more explicitly recognised in policy discussions. While this may reflect a degree of health selective mobility between employment and homemaking

among women, tailored responses could be developed. For example, one question is whether more general employment support might be provided for women wishing to re-enter the labour market - not just support for lone mothers.

Apart from a general challenge of enabling secure adequately paid employment for people in more disadvantaged social positions, a key challenge for policy makers, however, is the permanently sick group of sickness benefit claimants. The evidence presented in this report has shown that they are a particularly disadvantaged group whose ill health appears to be exacerbated by their position in society. This is a costly position, not only in terms of benefit payments, but also healthcare utilization and the opportunity cost of wasted talent. Arguments for more focused action can therefore be made not only on the grounds of costs but also for reasons of social justice. As many claims to sickness benefit are related to mental health problems, the particularly high risk of premature mortality in the group is arguably an avoidable source of health inequality. Clearly strategic approaches would be needed to better support permanently sick people. These might, however, best be served by considering the social position of permanently sick people more broadly and accepting that they remain a very sick cohort of people in relative terms if not in absolute historical terms. The theoretical literature discussed suggests more focus on remediating the constrained psychosocial environments that permanently sick people face. For example, enabling greater opportunities for social participation among permanently sick people may be a useful area for investigation.

8.2. Social implications

The findings are also relevant to society at large and members of the general public. Two key messages can be drawn from the study.

1. Stable employment is good for health. This research shows that people who are consistently in employment have better health than those who spend time out of work, particularly for people out of work and on benefits, and to a lesser degree for women who spend time out of the labour market to looking after the home family,

where findings are more mixed. While we don't always have control about whether to stay in or leave paid work, in general people should remember that being out of paid work is related to poorer health in the longer term, and make choices with this knowledge where they are able.

2. The evidence about how domestic work affects health is less clear-cut but seems to suggest that how people feel about their domestic workloads is a bigger influence on health than the amount of domestic work they do. Discussing how housework is shared within a household may help to prevent the stress and ill health that can be linked to feeling overloaded with housework.

Closing remarks

This study has shown that the labour market is a powerful force, which structures daily activity and influences individual social positions across the adult life course fundamentally, so influencing health and longevity in later life. The relatively good health accumulated by stably employed people suggests that full employment should not be forgotten as a policy goal. The persistently increased risk of mortality among permanently sick people is, at first glance, what might be expected. Considered more carefully, the high mortality rates of people in the permanently sick role raise the question of the extent to which we should expect the role to be associated with premature mortality or whether some of the deaths are avoidable.

Appendix 1

Search strategy for identifying reviews on labour market position and health

Query using OvidSP

1. meta-analysis.pt,sh.
2. (meta-analy\$ or metaanal\$).tw.
3. (quantitative\$ review\$ or quantitativ\$ overview\$).tw.
4. (systematic\$ review\$ or systematic\$ overview\$).tw.
5. (methodologic\$ review\$ or methodologic\$ overview\$).tw.
6. (integrative research review\$ or research integration\$).tw.
7. quantitativ\$ synthes\$.tw.
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. (pooling or pooled analys\$ or mantel haenszel).tw.
10. (peto or der simonian or dersimonian or fixed effect\$).tw.
11. 9 or 10
12. review.pt,sh. or review\$.tw. or overview\$.tw.
13. 11 and 12
14. 8 or 13
15. health/ or health status/ or quality of life/ or mental health/ or ("ill health" or "ill-health").ti,ot,ab,sh.
16. mortality/ or death\$.ti,ot,ab,sh.
17. 15 or 16
18. 14 and 17
19. Unemployment/ or (unemploy\$ or workless\$ or jobless\$ or economic inactivity or economically inactive).mp.
20. Employment/ or work/ or (employ\$ or economic activity.mp. or economically active).mp.
21. 19 and 20
22. 18 and 20
23. limit 22 to humans
24. limit 23 to english
25. limit 24 to yr="1990 -Current"

Example of information extraction form

Critical appraisal of review-level literature

Does worklessness damage health? Why?

Paper reviewed			
(Roelfs et al., 2011) Roelfs, D. J., Shor, E., Davidson, K. W., & Schwartz, J. E. (2011). Losing life and livelihood: A systematic review and meta-analysis of unemployment and all-cause mortality. <i>Social Science & Medicine</i> , 72(6), 840-854.			
Relevance to topic			
Does the paper consider the relationship between worklessness and a health?	<u>Yes</u>	No	Unsure
Addresses issues of causation? Aids understanding of whether worklessness causes poor health?	<u>Yes</u>	No	Unsure
Review methods			
Type of paper	-Systematic review - <u>Meta-analysis</u> -Rapid evidence assessment	-Literature review -Other (specify)	
Does the paper have a clearly focused aim or research question?	<u>Yes</u> To understand the impact of potential mediating, moderating and confounding factors on the association between unemployment status and mortality.	No	Unsure
Do the authors try to identify all English language papers?	Yes	No	Unsure
Quality			
Do the authors appraise the quality of the included studies? Is a rating system used? Did more than one assessor review studies	<u>Yes</u> Systematic bibliographic database search, and coding by two assessors, consulting a third author when needed. Rating system	No	Unsure
Are the methods used appropriate and defensible? Where results are combined, was reasonable to do so? Are: Results of included studies clearly displayed? Studies addressing similar research questions? Studies sufficiently similar in design? Results similar from study to study (test of heterogeneity) Reasons for variation in results discussed?	<u>Yes</u> Meta-analysis and meta-regression used. Data mainly from large scale studies in Europe and North America (15 countries total). Data were published from 1984 to 2008 but sensitivity analyses showed the period of research did not affect the size of HRs.	No	Unsure

Results		
Health outcomes considered	-General morbidity -Mortality -Mental health	-Specific condition (specify) -Other (specify)
Labour market issues considered	Effect of unemployment	
Population group	Men and women (typically working age).	
Number of studies included in review	42	
What are the review findings? Reasons for variation in results discussed?	Confirms an association between unemployment and all-cause mortality, which has not changed significantly since the 1970s and appears to persist for individuals in the short term and longer (over 10 years). The magnitude is larger for men (HR 1.78) than for women (HR 1.37) and for people unemployed below the age of 50 years.	
Generalizable to a UK population? Consider whether the study contains UK data, any cultural policy/contextual differences from UK that might affect results.	Yes	No Unsure Includes data from 6 UK studies and mainly information from Europe. All studies from industrialised countries. Effect of region also considered but no indication that it was significant.
Conclusion		
Accept for inclusion in literature review?	<u>Yes</u>	No
Additional comments: Roelfs et al examined the association between individual-level employment and all-cause mortality in a meta-analysis of 42 studies in industrialised nations. The findings confirm the association between unemployment and mortality and are suggestive of a causal effect of unemployment on mortality. The magnitude is larger for men (HR 1.78) than for women (HR 1.37) and for people unemployed below the age of 50 years While the authors aim to understand the importance of moderating factors in this relationship to support the 'coping hypothesis', there is little information available that enables examination this issues directly in selected studies. The coping hypothesis is a possible explanation for the causal pathway between unemployment and health, which posits that people adopt health-damaging behaviours when they become unemployed. An alternative explanation is 'latent sickness' or 'health selection'. The study found some evidence of health selection - HRs that controlled health behaviours were significantly lower than those that did not. But the findings better support a causal explanation as controlling for health this did not substantially affect the estimated degree of mortality risk among unemployed people.		

Roelfs, D. J., Shor, E., Davidson, K. W., & Schwartz, J. E. (2011). Losing life and livelihood: A systematic review and meta-analysis of unemployment and all-cause mortality. *Social Science & Medicine*, 72(6), 840-854. doi: <http://dx.doi.org/10.1016/j.socscimed.2011.01.005>

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