Public Health Research Consortium

In what circumstances can parental employment improve child health?

Final Report

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Glossary of terms and acronyms

Critical period	A particular phase of child development when an exposure is likely to have a marked impact on an outcome
Cumulative (or accumulation)	Duration of exposure
Employment trajectories	Key employment pathways over time
Full-time employment	Paid employment of 30 hours or more per week
Limiting long-standing illness (LLI)	Any long-term illness, health problem or disability which limits someone's daily activities
Maternal employment	Paid employment of a mother figure
Parental employment	Paid employment of a mother or father figure
Paternal employment	Paid employment of a father figure
Part-time employment	Paid employment of less than 30 hours per week
Non-employment	No paid employment reported
Obesity	A Body Mass Index (BMI) above the International Obesity Task Force (IOTF) obesity cut-off
Overweight	A BMI above the IOTF overweight cut-off
Structured lifecourse approach	Life course model selection technique (see Mishra et al, 2009)
Sensitive period	A particular phase of child development when a child may be comparatively more sensitive to an exposure than during another phase or phases
Socio-emotional behaviour	Child behaviour rated on the Strengths and Difficulties Questionnaire (SDQ), measuring the domains of emotional symptoms, conduct problems, peer relationship problems and prosocial behaviour
CI	Confidence Interval
DH	Department of Health
MCS	Millennium Cohort Study
NCB	National Children's Bureau
OECD	Organisation for Economic Cooperation and Development
PHRC	Public Health Research Consortium
RR	Risk Ratio
UK	United Kingdom

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What this study adds:

- Against a backdrop of increasing parental employment in the UK, evidence of the relationship between employment and child health and wellbeing is limited and mixed.
- Using longitudinal data from a contemporary cohort (the Millennium Cohort Study), we focused on three *exemplar* child outcomes; overweight / obesity, limiting long-standing illness and socio-emotional problem behaviour, identifying different causal pathways linking parental employment from 9 months to 7 years and the outcomes. We found that long-term full-time maternal employment was associated with overweight; that parental non-employment was associated with problem behaviour; and that child limiting long-standing illness was associated with maternal non-employment. Qualitative research involving low income parents highlighted the balance between the demands of employment and child wellbeing that parents have to strike, and that the health and wellbeing of the child was at the fore when mothers made employment decisions.
- The relationship between employment and child health and wellbeing varies depending on the health outcome and characteristics of employment, parents, the socio-economic circumstances of the family and the child. This suggests that encouraging parental employment may have both positive and negative consequences, and employment should be considered in relation to factors such as flexible working, high-quality affordable childcare, dietary education, and support for parents who have caring responsibilities for children with a long-term illness or disability.

Abstract

Introduction

Parental employment is a key element of UK policies to reduce child poverty and associated health inequalities. Levels of parental employment have increased over the last generation, but evidence of its impact on child health is limited and inconsistent.

Methods

Longitudinal data from the first four sweeps of the Millennium Cohort Study (between 9 months and 7 years) were used to investigate associations between parental or maternal employment and health outcomes, unadjusted and adjusted for covariates. Qualitative research, comprising interviews with parents, analysed using the Framework option in Nvivo10, explored the ways in which parents think about child health and wellbeing in relation to employment.

Results

The quantitative analyses revealed that parental employment was associated with a range of measures of health and wellbeing, although the impact of employment status over time differed by outcomes. For overweight/obesity, risks increased cumulatively with each successive period in which the mother was recorded as in full-time employment. For limiting long-standing illness (LLI), the risk of maternal non-employment was greater when the mother had a child with a LLI. For socio-emotional behaviour, there was evidence that parental employment was associated with a lower risk of problem behaviour. The qualitative study found that while mothers varied considerably in terms of their decisions about paid employment, they saw protecting their children's health as key to being a 'good mother'. Accordingly, their employment and childcare choices were influenced by what they believed children would benefit from or cope with. The extent to which parents believed children could benefit from maternal employment depended on mothers securing the right working and caring arrangements.

Discussion

These findings suggest that relationships between parental employment and child outcomes are complex, and are influenced by the social, family, and economic context in which employment decisions are made and the child is growing up. These contextual factors should be considered when planning policies to increase participation in the labour market.

Executive Summary

Background / Introduction

The proportion of families with two parents in paid employment has increased over recent decades in the United Kingdom and other developed countries (1). These changes mainly result from mothers entering the labour market, while employment among fathers has remained high (2). There has also been an increase in employment levels among lone mothers, although these remain lower than levels for mothers in two-parent families (3). These trends partly reflect policy initiatives to encourage employment as a route out of family poverty (for example, DWP Working for Children, 2007 (4)).

However, the effects of parental paid employment or non-employment on child health and wellbeing have been little investigated, and most of the research has been cross-sectional and therefore cannot investigate pathways between parental employment and indicators of child health over time. In addition, quantitative findings are seldom contextualised through the narratives parents themselves provide about employment decisions and the wellbeing of their children.

Aims

The project examined relationships between parental employment and children's health and wellbeing up to age 7 years. The research questions focused on understanding how parental employment might influence children's health (positively or negatively), and, conversely, if children's health might influence parental employment decisions.

The project comprised four broad aims. First, to examine how current and recent UK policies relating to employment, particularly in relation to reduction of family poverty, had an impact on children's health. Second, to assess the relationship of parental, particularly maternal, employment with child health up to the age of 7 years. Third, to explore the mechanisms through which relationships between parental employment and child health arise. Fourth, to draw out how policy and practice might use this information to promote child health.

Methods

The project addressed these broad aims within three work packages:

1. A review of Government policy promoting employment, the reduction of child poverty and promoting life chances of all children from 1997 up to 2011 (updated in 2013) to provide a context for the research.

2. Quantitative analyses of a large, longitudinal study of children born in the UK at the turn of the century (the Millennium Cohort Study) to investigate the relationship between parental employment and child health, with the main focus on longitudinal data to establish possible causal relationships and mechanisms for three *exemplar* outcomes: overweight/obesity, limiting long-standing illness and child socio-emotional problem behaviour. Data were collected during the period from 2001 to 2008, when the children were around 7 years of age (i.e. in a period of national prosperity, before the 2008 financial crisis and subsequent recession).

3. Primary qualitative research to better understand how parents think about child health and wellbeing, and how their employment decisions are influenced by these. This was undertaken in 2012/13.

Key findings and conclusions

Policy review

The review relates to policies introduced by two political administrations, Labour (1997-2010) and the Coalition (2010-). Labour governed for three terms, mostly during a period of prosperity. In contrast, the Coalition government is in its first term, during which the UK has been in recession. Despite these differences, the importance of employment has remained a major area of policy. There has been a political consensus that paid employment is key to economic growth and the reduction of family poverty, with many policy initiatives designed to support parental employment, for example in the areas of tax and benefits, childcare provision and funding, flexible working and restrictions on receipt of out-of-work benefits. The Coalition government has prioritised the reduction of public debt through an austerity programme designed to produce sustained reductions in public spending. Against this backdrop, there has been a shift in policy emphasis, marked by a greater focus on "hard-working" families, with the aim to reward work and self-sufficiency while penalising families who do not work. The Coalition administration has also undertaken a major reo-organisation of the NHS, and public health responsibilities have been transferred to local authorities. It is important to note that the MCS data reported in this study pre-date the 2008 financial crisis and subsequent recession and the change of UK government.

Secondary analysis of the MCS

Parental employment

Patterns of employment in the MCS from 9 months to 7 years differed between fathers and mothers. There were high levels of full-time paternal employment throughout (around 90%). In contrast, maternal employment increased in prevalence as the cohort child got older, from 45% at 9 months to 60% at 7 years and most employed mothers worked part-time.

Parental employment and child health and wellbeing (cross-sectional associations)

These analyses took into account both the employment status of parents, in terms of whether or not they were working, and family structure. At ages 9 months, 3, 5 and 7 years, the presence of two employed parents was generally associated with better outcomes, whereas risks of poorer child outcomes were generally greater for children who lived in families where no parent was employed, either in couple or lone parent households. Compared to children of lone parents who were not employed, those with an employed lone parent had better outcomes.

Maternal employment and child health and wellbeing (cross-sectional associations)

Analyses of maternal employment (full-time versus part-time, more or less than 30 hours per week) showed either no relationship with the child outcomes, or a positive association with employment *per se*, and few differences by intensity of employment. An exception was child overweight/obesity, where risks were greater when mothers were employed full-time.

Pathways between employment and child health and wellbeing (longitudinal associations)

Cross-sectional associations cannot provide evidence of direction of causation between employment and child health, and therefore further analyses involved an investigation of possible pathways over time for three *exemplar* outcomes*:* overweight/obesity, limiting long-standing illness (LLI) and socio-emotional problem behaviour. Selection of these outcomes had a theoretical justification, as it was expected that the temporal pathways between employment status and each outcome would vary, and there was also empirical evidence that these outcomes were cross-sectionally associated with either or both parental and maternal employment.

Previous research has shown that maternal full-time employment is associated with risk of child overweight, and it has been suggested that time constraints may lead to less healthy patterns of diet and physical activity in these families. Given that a long time-scale is likely to be required for the

development of overweight, it was hypothesised that risk of overweight would increase with cumulative exposure to maternal employment. The analyses showed that risk of overweight/obesity increased for children whose mothers were full-time employed for two or more of the four periods of MCS data collection. No equivalent relationship for paternal employment and overweight was found, which is likely to be a consequence of full-time paternal employment being normative in this sample. The results may indicate time pressures in families where both parents are employed that challenge maintaining healthy lifestyles.

Having a child with a LLI is likely to have implications for mothers' ability (as the primary carer in most families), to initiate or maintain employment. Therefore it was hypothesised that the presence of a child with a disability in a household is likely to be associated with either continuous maternal non-employment or a transition out of employment. Results showed that LLI predicted both non-employment and a transition out of employment, particularly between ages 5 and 7 years, although associations were attenuated when adjusted for explanatory variables. The risk of a transition out of employment associated with the child developing an LLI was greater for lone mothers or mothers living in low income, particularly between 5 to 7 years. These findings suggest that having a child with an LLI limits opportunities to maintain employment or, for non-employed mothers, to seek employment. Such results suggest the need for support to enable employment for mothers in families with a child who has an LLI.

The direction of any relationship between employment and child behaviour is not necessarily clear-cut. While employment status may be viewed as influencing behaviour, it is also possible that having a child with problem behaviour may prohibit use of childcare (particularly in the pre-school years), and limit employment opportunities. We examined both the impact of trajectories of family and maternal employment on behaviour, and also whether prior behaviour predicted maternal non-employment or a transition out of employment (since mothers are generally primary carers, it was considered likely that their employment was more likely to be affected by child problem behaviour). Results indicated that having a parent in paid work was associated with a lower risk of problem behaviour among children at 7 years, and any period in which there was no employed parent was associated with poorer socio-emotional behaviour, even after taking into account a number of potential explanatory variables reflecting the socio-economic circumstances into which the child was born and the psychological and socio-economic benefits of employment within the family. Analyses focusing on maternal employment status showed that even after a prolonged period of non-employment, the risk of problem behaviour for children whose mothers made the transition into employment was no greater than among those with mothers in continuous employment, after adjustment for potential explanatory variables. However, movement out of employment and continuous non-employment were associated with a higher risk of problem behaviour. While there was evidence that child behaviour predicted both maternal non-employment and a transition out of employment, particularly between 5 and 7 years, associations were attenuated after adjustment for the explanatory variables, suggesting that employment status was not influenced by child behaviour *per se*. Overall, results suggest that both parental and mother employment are associated with a lower risk of child problem behaviour.

Qualitative findings

While mothers interviewed for the qualitative study varied considerably in terms of attitudes to and decisions about paid employment, they all saw protecting their children's health as key to being a 'good mother'. Accordingly, their choices were strongly influenced by what they believed children would benefit from or cope with. The extent to which children could benefit from maternal employment depended on mothers securing the right working and caring arrangements. Parents believed there was scope for improvement in relation to: financial support, enabling a parent to stay at home in a child's first year of life; ensuring parents can work flexibly and take time off when children are ill; and better and cheaper childcare facilities. Whilst much of what they suggested in relation to family-friendly working is covered by employment legislation, our sample included many

parents in a weak labour market position. Consequently, some seemed to be faced with a choice of: a) working arrangements that could result in high levels of stress for mothers and children; or b) not working or accepting a job which 'fitted with the children' but was at a lower level and less well paid than could be expected, on the basis of their qualifications and experience.

Research recommendations

The general pattern of results indicates that employment can have a positive relationship with a range of child health outcomes. However, a theme running through the research suggests that without appropriate support, it is difficult to combine work and family life, or maintain healthy lifestyles. This is particularly the case for families where the main carer is employed full-time, or where the child has a long-standing illness, especially if they are from a low socio-economic status group. Further research should continue to investigate parental employment and children's health as the Millennium Cohort Study children get older, including age-relevant outcomes. Qualitative work might focus on children with serious health problems, the health promoting component of high-quality childcare, and investigate fathers' perceptions on employment and child health.

1 Introduction/Background

This report first gives an overview of the policy context for parental employment in the United Kingdom over recent years. This is followed by cross-sectional and longitudinal analyses of the Millennium Cohort Study (MCS), showing levels of maternal and paternal employment in the cohort, and associations between employment and a number of child health and wellbeing outcomes. Qualitative research provides a narrative of issues individual parents have to consider when making employment decisions, including the wellbeing of their children. Finally, the connection between consortium themes and the research carried out is outlined, and conclusions drawn.

Most developed countries consider that a high employment rate is essential for national and individual economic success and sustainability. Policies to increase female employment form part of more general employment policies. In the UK, promoting parental employment (both mothers and fathers) has also been a main plank of policies to reduce child poverty, and its associated health inequalities. However, increased parental employment (or policies designed to achieve this) might conflict with other policy goals, such as promoting the life chances of all children, enabling families to thrive, and supporting employers and businesses to economic recovery, as well as with often unstated but essential national needs such as maintaining population fertility. Furthermore, the health of today's children largely determines the health of the future working age population.

The proportion of families with two parents in paid employment has increased over recent decades in the United Kingdom and other developed countries (1). These changes mainly result from mothers entering the labour market, while employment among fathers has remained high throughout (2). There has also been an increase in employment levels among lone mothers, although these remain lower than levels for mothers in two-parent families (3). For many OECD countries, increasing female employment, and particularly maternal employment, is seen as crucial for economic growth and sustainable pension systems. In the EU the Lisbon target was set for each member state to have a female employment rate of greater than 60% by 2010 (5). A report from the OECD, "Babies and Bosses" highlighted the huge variation by country in both paid maternal employment and in national policies that aim to encourage this (or not) (2). This reflects in part marked differences in culture and popular attitudes about whether or not women with young children should take up paid employment.

Although evidence suggests that employment is good for health in men and probably also women, the effect of parental paid employment on child health has been little researched. Since unemployment, poverty and deprivation are all associated with poorer adult health (6) and child poverty is associated with poorer child health (7), maternal employment might be expected to improve maternal and child health by increasing household income (8). Other potential benefits (to mothers) of paid employment include training and increased agency. On the other hand, employment may limit time for parenting, given that mothers still undertake the majority of domestic labour (9), increase stress and require change in childcare arrangements. Indeed, a key reason given by lone parents for not participating in the UK's New Deal for Lone Parents programme was that they viewed caring for their children as a full-time job, of paramount importance, which took priority over all other factors (10). Childcare incurs financial costs, or, when provided free by family members or friend, usually requires trade-offs and reciprocal arrangements, even if these are unstated. Childcare can also offer both benefits and burdens, depending on quality and affordability (11). Furthermore, the costs of childcare may determine whether employment can be gained. For example, the high costs of child care in the UK may mean that employment is not financially attractive in the short term in couple families, despite a tax structure that favours dual earner families (2). Whether the experience of being a working parent is positive or negative may also depend on the existence of family-friendly employment policies, such as the statutory provision of parental leave and leave to care for sick children (12).

Parental employment is seen as a route to tackle child poverty and so the health inequalities associated with child poverty. For low income couple families, this often means both parents going to work. The incentives to gain employment may operate for all families (both lone parents and couple families) and there are disincentives for lone parents not to seek employment. However, in most developed countries, employment rates are higher amongst women who are better educated, suggesting that increasing maternal employment might worsen inequalities (13, 14). Many children living in poverty are in households where one or both parents are employed. In 2010/11, just over 60% of all children in low income households were living with at least one parent who was working, mostly in couple households (15). In addition, family friendly policies, whilst available by right to all, may not be feasible for poorer families to take up. In an analysis of employed mothers of 5 year old children in the MCS there was no difference by household income in requests or permission for flexible working. However, only 19% of mothers in the lowest income fifth took up flexible working arrangements compared to 43% in the highest fifth of household incomes (16). Furthermore, child poverty will only be relieved if parents can find worthwhile employment. The extent to which existing policies can continue to support parents into reasonably remunerated employment was criticised even before the current economic recession (17).

There is relatively little research published on the relationship between parental employment and child health. Some studies have noted the adverse health experience of children where both parents are unemployed compared to children in households where at least one parent is working. For example, in a study of five Nordic countries, psychosomatic symptoms, chronic illness and low wellbeing were reported more frequently for children in households with no parents employed in the past six months compared with families where one or two parents were employed. This relationship was only partly explained by adjusting for confounders such as social class and immigrant status, indicating a continuing effect associated with worklessness (18).

Others have focused on whether or not maternal employment, particularly in the early years, has any adverse associations with child development. These studies are hotly debated but in general there is no compelling evidence that childhood development is adversely affected, and there may be some benefits, particularly if high quality childcare is accessed (19).

Further studies have focused on plausible pathways to specific conditions, recognising that, particularly when children are young, mothers rather than fathers carry out the majority of childcare tasks (20). For example, lack of time consequent on maternal employment might influence the capacity of parents to attend immunisation appointments, to provide healthy meals and to give their children opportunities for physical activity. On the other hand, increased family income might allow purchase of healthier food or increase access to facilities for exercise. Safe childcare facilities (pre-school or school based) might decrease rates of unintentional injury but increase exposure to infection and reduce opportunities for developing independence outside a childcare setting.

The picture from existing evidence is mixed. Breastfeeding initiation and duration are lower amongst mothers who return to work when their child is a young infant, but analysis has shown that some characteristics of maternal employment can ameliorate this (21). A systematic review indicated that immunisation was no less likely in the pre-school children of employed mothers whereas early childhood obesity was more common in families where the mother was employed, but this effect was confined to higher income families (22). In a secondary data analysis of the MCS, indicators of diet and physical activity in 5 year old children were more favourable in households where the mother was employed but these households were also more advantaged. After adjustment for indicators of advantage, such as maternal education, maternal employment was associated with disadvantageous health behaviours in their children (16).

Thus, the gap in evidence is not whether living in a workless household is bad for children's health (given that nearly all workless households are poor, this can be predicted) but how the different

patterns of employment and work that characterise modern families (in their many forms) are associated with children's health and health inequalities. Parental, particularly maternal, employment might lead to adverse or beneficial effects on children's health through a variety of hypothesised pathways (related to economic benefits of working, opportunity costs, substituted child care, etc.), with plausible child health-related outcomes including health behaviours, wellbeing, mental health, unintentional injuries, health care seeking behaviours (such as immunisation) and parental health.

Although this project considers parental employment (both maternal and paternal), there is also some focus on mothers. This is because most lone parents are women (23), and in couple families most of the variability in employment status is seen in female partners (24). By contrast, the presence of children in households does not have any significant influence on male employment rates (2). Further, mothers carry out most of the caring and domestic tasks associated with having children (20). Trends in parental employment have only changed dramatically for women, not for men (25). In addition, maternal employment patterns are more variable than men's, with more mothers than fathers working part-time (2). The study also utilises longitudinal data. Mothers' patterns of employment tend to change over time, with some mothers returning to more intensive employment once children enter primary school (26). Thus, the increase in levels of employment within families conceals differing patterns of employment and non-employment, including movements into and out of the labour market. Furthermore, the impact of employment on children may differ depending on timing, intensity and duration. Investigation of these issues benefits from a longitudinal rather than a cross-sectional perspective.

1.1 Policy review

A policy review was undertaken at the start of the project, to identify Government policies promoting employment, the reduction of child poverty and promoting life chances of all children. The initial scope focused on policies proposed and implemented over the course of the MCS up to the start of the project (a period between 1997-2011, and so predominantly pre-recession), with an update in 2013. Therefore, the review relates to policies introduced by two opposing governments in different economic contexts. The Labour administration governed for three terms, mostly during a period of prosperity. In contrast, the Coalition government is in its first term, during which the UK has been in recession. Nevertheless, a major conclusion drawn from the review is that, from 1997 onwards, there has been a political consensus in the UK that paid employment is key to economic growth and reducing family poverty. There have been many policy changes designed to support parental employment, for example in the areas of tax and benefits, childcare provision and funding, flexible working and restrictions on receipt of out-of-work benefits. Childcare provision is closely associated with employment policy, and there were a number of initiatives under the last Labour Government to improve provision, cost and quality of local childcare (i.e. Childcare Strategies) which have continued under the Coalition, including honouring commitments to expand free childcare. Childcare policy that is linked to parental employment includes the Childcare element of Working Tax Credit, the local authority duty to ensure adequate supply of childcare, childcare flexibility and extended schools. In terms of informal childcare and pension credits there have been fewer clear cut policy interventions, although it is acknowledged to be valuable, and the Coalition has introduced National Insurance contribution credits for those aged between 16 years and state pension age who are caring for a child under 12 years. In terms of child public health policy, health and development have been referenced in policies on poverty and child welfare. These have reflected the negative impact of poverty on health, life-course perspective linking childhood health behaviours with adult health outcomes (healthy eating, obesity and play) and that children are a vulnerable group requiring greater protection and support.

The review was updated in 2013 to identify the current policy context for the research findings. Many of the policies included in the original review have continued in the subsequent years, but in

modified forms. The period since the original review was undertaken has seen a number of themes crystallise. For example in a time of recession, the Coalition government has prioritised the reduction of public debt, and an austerity programme designed to produce sustained reductions in public spending was initiated in the Budget of 2010, affecting most government departments (with ring-fenced funds for schools, health and international development), and major cuts to local government budgets, with the more disadvantaged local authorities in the country the hardest hit (27). Secondly, there has been a large-scale reorganisation of the health service and a change in responsibilities between health services and local authorities. The 2012 Health and Social Care Act transferred public health responsibilities from the NHS to local government, including roles in commissioning and collaborating on the delivery of public health services. Commissioning of children's public health transferred to local authorities in 2013 for five- to 19-year-olds and will transfer in 2015 for children under five years. There have also been announcements of outcomes-based initiatives, including in particular the Children and Young People's Health Outcomes Strategy (2012) which has elicited a government commitment to improving child health and reducing mortality. Thirdly, changes to the benefits system have been introduced, designed to reduce eligibility and level of welfare benefits, including policies to penalise mothers who do not take up employment, such as the continued reduction in the age of the youngest child at which lone mothers on benefits are obliged to seek work, lowered from 12 years to 5 years (2012), a cap on the total amount of welfare benefits that may be claimed by a family, and the introduction of universal credit (both from 2013). In addition, previously universal child benefit has been removed from families with a higher rate tax payer (2013). Finally, there has been a focus on "hard-working families", with the aim to reward work and self-sufficiency, while penalising families who do not work. Official figures suggest that the proportion of workless households has declined (28), with government policy continuing to focus on encouraging people into work, in part through changes to the benefits system described above. In addition, specific support for "hard-working families" has been announced, including tax breaks for childcare, improved access to social housing and greater out-of-hours access to GPs. Policies have also been proposed to allow parents (and other employees) to strike a better balance between work and home commitments, such as changes to flexible working regulations to include non-parents (in 2014), an increase in the unpaid parental leave allowance from 13 weeks to 18 weeks (2013), and the introduction of flexible parental leave between parents (2015). Commitments on childcare provision have focused on access and affordability, including provision of free childcare for disadvantaged 2 year olds (introduced nationally in 2013) and a proposed tax-free childcare scheme to be offered by all employers (2015), which is planned to replace the existing childcare voucher system.

To conclude, policies from both administrations have identified the importance of employment, and there has been continuity in a number of areas, such as attempts to improve both the quality and provision of childcare. However, there have also been policy differences, both economically and ideologically driven, which are reflected in significant changes in benefits provision, reforms of health and social care, and a greater focus on working and non-working families.

2 Project Aims/Objectives

The project examined the relationship between parental employment and children's health and wellbeing up to age 7 years. The research questions focused on understanding how parental employment might influence children's health (positively or negatively), and, conversely, if children's health might influence employment decisions.

The four broad project aims were:

1. To examine how current and recent UK policies (as at 2011) relating to employment, particularly in relation to reduction of family poverty, impact on children's health.
2. To assess the relationship of parental, particularly maternal, employment with child health up to the age of 7 years.
3. To explore the mechanisms through which relationships between parental employment and child health arise
4. To draw out how policy and practice might use this information to promote child health.

The project addressed these broad aims within three work packages. In the first work package, policy was reviewed to provide a description of the policy context for the research (Research Aim 1); this was summarised in Section 1 of this report. The second work package comprised secondary data analysis of the MCS, carried out to investigate the relationship between parental employment and child health, with the main focus on longitudinal data to establish possible causal relationships and mechanisms for three *exemplar* outcomes (Research Aims 2, 3 and 4); the results of this work are included in Section 4. Work package 3 used primary qualitative research to gain a better understanding of how parents think about child health and wellbeing, and how their employment decisions are influenced by child health issues (Research Aims 3 and 4); research described in Section 5.

3 Quantitative Analysis: Design and Methods

3.1 Millennium Cohort Study

Secondary analyses were carried out using longitudinal data from the Millennium Cohort Study (MCS). The MCS is a large, nationally-representative study of the social, economic and health-related circumstances of children born in the UK between September 2000 and January 2002 and registered for the (then) universal Child Benefit. It was designed to over-represent children living in disadvantaged areas, from ethnic minority groups and Wales, Scotland and Northern Ireland. The first study contact with the cohort child (MCS1) was around age 9 months (06/01-01/03), when data were collected on 72% of those approached, providing information on 18,818 infants. Survey interviews were carried out in the home with the main respondent (usually the mother). At the time of this project, three further sweeps of data were available (MCS2-4) when children were aged around 3 years (09/03-04/05), 5 years (01/06-12/06) and 7 years (01/08-12/08). Full details are available at http://www.cls.ioe.ac.uk/. Data were downloaded from the UK Data Archive, University of Essex, in May 2010.

The MCS has detailed data on parents and cohort children, including information on employment and non-employment for both parents, child health and health behaviours, anthropometry of the cohort child, including measured body weight and height, and indicators of child mental health and wellbeing. There are also data on parents' health and wellbeing and the social and family circumstances in which the cohort child and their family are living at each data collection sweep, such as income and parental educational achievement.

Attrition is a problem common to longitudinal studies, and we used response weights to account for attrition up to the 7 year survey. Of the 13,681 children who took part at 7 years, 11,538 (84%) had data for all four sweeps, and the number of cases was further reduced when taking into account missingness on individual variables.

3.2 Parental employment

Parents of the child reported their current employment status at the four data collection sweeps, including usual hours of work. Non-employment comprised those who did not have paid work, those on long-term leave from work, and students. Variables were derived representing current employment status for mothers and fathers, individually and combined for cross-sectional analyses. In addition a binary variable, parental employment, was created for each sweep, identifying whether or not there was an employed parent, without distinction between mothers' and fathers' employment or one or two parent families. Longitudinal employment variables were derived by combining current employment status at each sweep, using a life-course perspective (described in Section 3.5.2).

3.3 Health and wellbeing measures

A number of health and wellbeing measures that potentially could be related to parental employment are available in MCS. While cross-sectional associations are of interest, a key element of this research was to try to disentangle as far as possible the temporal sequence that may link employment and child outcomes. The nature and direction of hypothesised relationships over time is shown in Table 3.1 for a range of outcomes. It is proposed that employment precedes the development of some outcomes. This does not indicate a direct causal link, but rather that factors associated with having an employed parent may increase the risk of the outcome. For example, there is existing evidence that full-time maternal employment is associated with a higher risk of overweight among young children (29), which is likely to reflect particular dietary and physical activity patterns in families where parents work longer hours. In contrast, the health of a child may preclude a parent

gaining or maintaining employment. For example, there is evidence that parental employment is less likely in families with a seriously disabled child (30), where balancing support and care for the child and paid employment may be untenable. In other cases, such as child socio-emotional problem behaviour, any causal relationship between employment and the outcome may be in either, or both, directions (31).

Table 3.1: Parental employment and measures of child health and wellbeing: hypothesised direction of association

Outcome	Child wellbeing → Employment status	Employment status → Child wellbeing
Child physical health		
Child's general health (fair/poor)	✓	✓
Limiting long-standing illness	✓	×
Injury	×	✓
Overweight/obesity	×	✓
Asthma	✓	×
Fits	✓	×
Immunisation status	×	✓
Child mental health		
Socio-emotional problem behaviour	✓	✓
Autism	✓	×

Table 3.2 identifies the age at which these health and wellbeing measures were recorded, which is important when investigating causality, requiring measures at different times (in this case, data collection sweeps).

Table 3.2: Health and wellbeing measures recorded by age of child

Outcome	9 months	3 years	5 years	7 years
Child physical health				
Child's general health	×	×	✓	✓
Limiting long-standing illness	×	✓	✓	✓
Injury	✓	✓	✓	✓
Overweight/Obesity	×	✓	✓	✓
Asthma	×	✓	✓	✓
Fits	×	✓	✓	✓
Immunisation status	✓	✓	✓	×
Child mental health				
Socio-emotional problem behaviour	×	✓	✓	✓
Autism	×	×	✓	✓

3.4 Covariates

A number of variables that may influence the relationship between parental employment and child outcomes were selected for inclusion in multivariable models, including socio-economic circumstances, child and parent factors. For cross-sectional analyses, a standard set of covariates was used, selected *a priori* because they were considered to measure the socio-economic circumstances of families: maternal ethnicity; highest maternal qualification; maternal age at first live birth; and lone motherhood status at the cohort member's birth. More detailed longitudinal analyses included specific sets of variables chosen because they were relevant to that outcome.

3.5 Analyses

Generalised regression analysis (Poisson and linear, as appropriate) was used for the analyses contained within the report. Modelling adjusted for potential explanatory variables using multivariable regression techniques. All multivariable analyses were carried out using complete samples so that estimates could be directly compared before and after adjustment. Data were analysed to taking account of the clustered sampling design and non-response weights were used to account for attrition between sweeps. All analyses were conducted in Stata/SE 12.1 (Stata Corporation, TX), using 'svy' commands to allow for the clustered sampling design and attrition.

3.5.1 Cross-sectional analyses

As background to the research, prevalence of employment for the mothers and father of the cohort children was estimated from 9 months to 7 years. Relationships between both parental and maternal employment and a number of child health and wellbeing outcomes were also tested at each MCS sweep.

3.5.2 Longitudinal analyses

Longitudinal data were used to investigate the nature of any association between employment and child outcomes according to a life-course framework: a) the effect of cumulative exposure to employment; (b) the effect of exposure at particular times in a child's life (critical or sensitive periods); c) the effect of particular trajectories of employment; d) the possibility of reverse causation, for example, whether the parents of children who are or become disabled are subsequently less likely to hold paid employment.

We anticipated that plausible pathways would vary by outcome, and a structured life-course approach (32) allowed models corresponding to different life-course hypotheses to be tested formally using regression analysis. Longitudinal employment measures representing life-course perspectives outlined above (a, b and c) were operationalised using MCS data:

- accumulation (or cumulative exposure, measured according to number of data collection sweeps exposed to parental employment or non-employment);
- critical periods (employment status for one particular sweep);
- sensitive periods (measures of employment status for the four sweeps included, with mutual adjustment);
- employment trajectories (the most common patterns of stability or change in employment status).

A longitudinal measure (or measures) of employment status was selected if it represented a plausible pathway linking employment and a particular outcome, and it fitted the data. This involved assessing whether the employment measure predicted the outcome of interest at age 7 as well as one comprising all possible permutations of employment status over the four sweeps (the 'saturated' model). If a more parsimonious life-course model of exposure to employment fitted the data as well as the 'saturated' model, it was used in used in further analyses.

For analyses of reverse causality, prior child health was used to predict subsequent parent employment status.

The longitudinal analyses carried out in this project focused on child health and wellbeing variables selected as *exemplar* outcomes because they were hypothesised to have particular temporal associations with employment.

Overweight/obesity

We hypothesised that only one direction of causation was likely, with overweight/obesity predicted to follow employment. Height and weight were measured objectively during MCS interviews; analyses are based on overweight/obesity recorded at 7 years.

Child limiting long-standing illness (LLI)

We hypothesised that only one direction of causation was possible; the parent of child with a LLI would be less likely to enter or maintain employment. Main respondents were asked whether the cohort child had been "troubled" by any "longstanding illness, disability or infirmity… for a period of time of is likely to affect [the child] over a period of time", and then whether that illness limited the child's activity in any way. Using these questions, LLI was categorised as the presence of a long-standing illness which limited performance, without reference to the nature of the illness or disability. LLI was recorded at 3, 5 and 7 years, and LLI from these three sweeps were used to examine associations between LLI and maternal employment status from 3 to 7 years.

Child socio-emotional behaviour

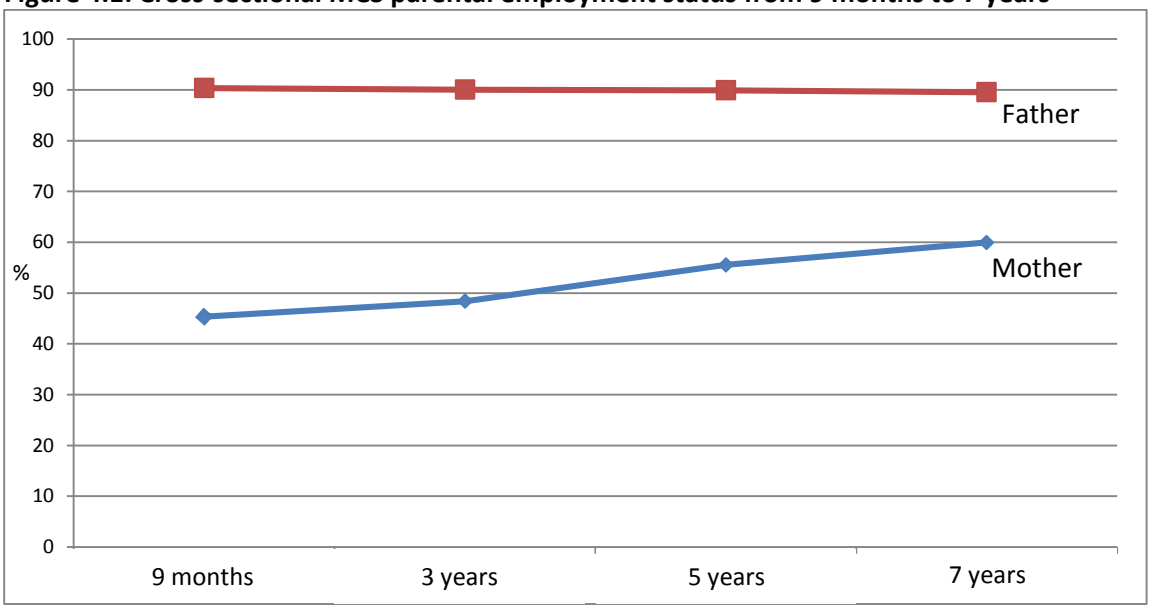
We hypothesised that causality could be in either direction, with socio-emotional problem behaviour preceding a transition out of employment (reverse causality) or following employment. Socio-emotional behaviour was assessed at 7 years using the Strengths and Difficulties Questionnaire (SDQ), a 25-item measure completed by the main respondent. We used the total difficulties score, which is the sum of four difficulties components (peer problems, conduct disorders, hyperactivity and emotional problems) to classify children, using validated cut-offs, as having 'normal', or 'borderline-abnormal' (problem) scores. If only one or two items in any component were missing, we used the average value from the remaining items to generate a complete component.

4 Main Quantitative Findings

4.1 Employment trends

The quantitative results shown in this report relate to employment among parents of MCS children. Parental employment has been recorded at each data collection sweep, and the focus of this research is on data collected from 9 months to 7 years. Figure 4.1 shows the percentages of mothers and fathers in employment, using cross-sectional data from each sweep. The prevalence of paternal employment was fairly stable over time (around 90%); in contrast maternal employment increased in prevalence with successive sweeps. These trends led to a small convergence in levels of employment over time; nevertheless, fathers were much more likely than mothers to be in employment by the time the child was 7 years old.

Figure 4.1: Cross-sectional MCS parental employment status from 9 months to 7 years



Patterns of full-time and part-time employment across the sweeps are shown in Table 4.1. Most employed mothers worked part-time, although both full-time and part-time employment increased over time. Paternal employment was predominantly full-time at every sweep.

Table 4.1: Detailed cross-sectional maternal and paternal employment status by MCS sweep (%)

	9 months	3 years	5 years	7 years
Mother				
Full-time	12.1	12.2	14.4	17.2
Part-time	33.3	36.2	41.2	42.8
not employed	54.7	51.6	44.4	40.1
Father				
Full-time	86.3	84.8	84.6	83.3
Part-time	4.1	5.3	5.4	6.2
not employed	9.6	10.0	10.1	10.5

Cross-sectional data from 9 months through to 7 years show the relationship between employment and family structure (Table 4.2). At each data collection sweep, most MCS households contained at least one working parent, and by 7 years almost half had two working parents. In lone parent families, employment increased in prevalence at every sweep; by 7 years the proportion of lone parents employed was similar to those who were non-employed.

Table 4.2: Cross-sectional parental employment status by MCS sweep (%)

	9 months	3 years	5 years	7 years
couple: both employed	41.0	41.0	45.1	46.7
couple: only father employed	34.8	31.5	25.7	20.8
couple: only mother employed	1.9	2.1	2.0	2.0
couple: neither parent employed	6.2	5.4	5.0	4.9
lone parent: employed	3.3	6.2	8.9	12.1
lone parent: not employed	12.9	13.8	13.2	13.6

4.2 Cross-sectional associations with parental employment

4.2.1 Parental employment and child outcomes

Cross-sectional associations between parental employment and child outcomes at 7 years are shown in Table 4.3, with risk ratios adjusted for a set of standard covariates, listed in Section 3.4. Adjusted risks associated with parental employment varied by outcome, and in some cases there was no clear association (overweight and asthma). However, generally risks of poorer child outcomes were elevated for children who lived in families where no parent was employed, either in couple or lone parent households. In contrast, better health was observed for those children living in households with an employed parent, particularly in two parent families. Families that may be characterised as "traditional", comprising a working father and a non-working mother, were a minority of households when the cohort children were 7 years old, and had risks which were no different or poorer compared to those two-parent households where both parents were employed.

Further analyses did not focus on a detailed analysis of parental employment, as shown above. This was decided for a number of reasons:

- While maternal employment varied over time, there was very little variation in paternal employment, with almost 90% of fathers continuously employed for all MCS sweeps, most working full-time.
- Changes in family structure and the potential for changing identity of the partner respondent between sweeps made it difficult to be able to investigate longitudinal patterns of employment for fathers. In contrast, mothers tended to be the main respondent, participating in all sweeps.
- Detailed longitudinal trajectories would be overly-complex if comprising combinations of both parents (and lone parent) employment status over the four sweeps.

Therefore, longitudinal analyses employed either a simple parental employment variable (in terms of whether or not there was an employed parent in the household, regardless of gender or family structure) or considered maternal employment. However, paternal employment was included as a covariate in some analyses of mothers' employment, categorised as father employed or not employed, or no father figure in the family.

Cross-sectional associations for earlier sweeps are included, for reference, in Appendix 1.

Table 4.3: Adjusted† risk ratios for outcomes by concurrent parental employment status at 7 years

	Child general health (fair / poor) RR (95% CI)	Limiting longstanding illness RR (95% CI)	Injury RR (95% CI)	Overweight RR (95% CI)	Asthma RR (95% CI)	Fits RR (95% CI)	Problem behaviour RR (95% CI)	Autism RR (95% CI)
couple: both employed	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
couple: only father employed	1.84 (1.27-2.67)	1.64 (1.30-2.06)	1.00 (0.89-1.11)	0.94 (0.82-1.07)	1.04 (0.91-1.18)	0.95 (0.72-1.25)	1.32 (1.09-1.59)	2.65 (1.70-4.15)
couple: only mother employed	0.81 (0.25-2.59)	1.92 (1.10-3.34)	1.13 (0.86-1.49)	1.05 (0.76-1.44)	0.99 (0.68-1.43)	1.63 (0.69-3.84)	1.34 (0.79-2.29)	2.05 (0.69-6.09)
couple: neither parent employed	2.21 (1.27-3.83)	2.23 (1.51-3.30)	1.24 (1.03-1.49)	0.81 (0.64-1.02)	0.99 (0.75-1.31)	1.46 (0.87-2.45)	2.13 (1.64-2.76)	4.35 (1.84-10.29)
lone parent: employed	1.65 (1.08-2.53)	1.45 (1.07-1.95)	1.03 (0.90-1.19)	1.07 (0.92-1.35)	1.07 (0.90-1.28)	1.35 (0.95-1.93)	1.27 (1.01-1.60)	1.83 (0.92-3.63)
lone parent: not employed	1.84 (1.17-2.91)	2.33 (1.73-3.13)	1.06 (0.91-1.25)	1.06 (0.89-1.27)	1.08 (0.90-1.30)	1.51 (0.99-2.30)	1.92 (1.54-2.40)	3.65 (1.72-7.71)
Total‡	**9809**	**9833**	**9807**	**9634**	**9783**	**9809**	**8102**	**9797**

† Standard covariates: maternal ethnicity, highest maternal qualification; maternal age first live birth; lone mother at cohort member's birth

‡ Numbers vary due to level of missingness on each outcome

4.2.2 Maternal employment and child outcomes

Cross-sectional associations between maternal employment and child outcomes at 7 years are shown in Table 4.4, with risk ratios adjusted for the set of standard set of covariates listed in Section 3.4. For these analyses, full-time was defined as greater than 30 hours/week and part-time as 30 hours or less /week. For most outcomes, differences in the adjusted risks for employed compared to non-employed mothers were non-significant, or risks were lower for the employed mothers. The exception was for overweight/obesity, with adjusted risks significantly greater for the children of full-time employed mothers. After adjustment, the risk for full-time maternal employment (compared to non-employment) increased from uRR=1.13 (1.02-1.26) to aRR=1.26 (1.13-1.41). Cross-sectional associations for earlier sweeps are included, for reference, in Appendix 2.

4.2.3 Summary

In summary, cross-sectional associations between parental employment and a range of outcomes at 7 years showed worse outcomes for children who lived in families where no parent was employed, either in couple or lone parent households. The presence of two employed parents was generally associated with better outcomes compared to other groups. Focusing on maternal employment, cross-sectional associations were tested for a number of outcomes at all data collection sweeps, and included intensity of work (hours worked, divided into full or part-time employment: 30 hours per week cut-off). These analyses showed either no relationship between employment and outcomes, or a positive effect associated with employment, with few differences by intensity of employment. An exception was overweight/obesity, where risks were greater among full-time employed mothers.

Cross-sectional findings for parental and maternal employment do not provide evidence of direction of causation, and therefore the next stage of the research involved an investigation of the likely direction of causality for the *exemplar* outcomes, as described in Section 3.5.2, overweight/obesity, limiting long-standing illness and socio-emotional problem behaviour. These were chosen for theoretical reasons, as it was expected that the pathways between employment status and each outcome would vary. However, the cross-sectional analyses provided empirical evidence that at 7 years the selected outcomes were associated with either or both parental and maternal employment.

Table 4.4: Adjusted† risk ratios for outcomes by concurrent maternal employment status at 7 years

	Child general health (fair / poor) RR (95% CI)	Limiting longstanding illness RR (95% CI)	Injury RR (95% CI)	Overweight RR (95% CI)	Asthma RR (95% CI)	Fits RR (95% CI)	Problem behaviour RR (95% CI)	Autism RR (95% CI)
Not employed	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Employed part-time	0.59 (0.43-0.80)	0.60 (0.49-0.72)	0.95 (0.87-1.05)	0.97 (0.87-1.07)	0.95 (0.86-1.06)	0.89 (0.69-1.13)	0.61 (0.54-0.70)	0.95 (0.86-1.06)
Employed full-time	0.79 (0.52-1.19)	0.65 (0.50-0.84)	1.06 (0.93-1.20)	1.26 (1.13-1.41)	1.01 (0.89-1.14)	1.03 (0.76-1.39)	0.77 (0.66-0.91)	1.01 (0.89-1.14)
Total‡	11241	11235	11237	11002	11214	11241	11007	11214

† Standard covariates: maternal ethnicity, highest maternal qualification; maternal age first live birth; lone mother at cohort member's birth

‡ Numbers vary due to level of missingness on each outcome

4.3 Longitudinal associations

4.3.1 Overweight / obesity

There is a growing recognition that childhood obesity is a major public health problem. Over recent years, this has resulted in a range of policy initiatives designed to address the causes of obesity, including, for example, "Healthy Lives, Healthy People: a call to action on obesity in England" (2011). There is evidence from other studies, including analysis of earlier MCS sweeps that maternal employment (in particular full-time), is linked to overweight and less healthy patterns of diet and physical activity, and it is hypothesised that time constraints in families where both fathers and mothers are employed (or employed lone mothers) make it more difficult to provide a healthy diet and to support children to get involved in physical activities (Hawkins et al, 2008, 2009). Most evidence linking employment with overweight has been cross-sectional. Given that overweight develops over time, this analysis utilised employment data from 9 months to 7 years to examine the long-term relationship between employment and overweight at 7 years.

The cross-sectional relationships shown in the previous chapter between employment and overweight at age 7 indicated no significant relationship by parental employment, whereas the risk of overweight was raised for full-time (30 hours or more per week) maternal employment. Given these findings, the predominance of full-time paternal employment and of mothers as family carers, longitudinal analysis focused on exploring the link between the duration of full-time maternal employment and childhood overweight/obesity. The long time-scale likely to be required for the development of overweight suggested that a cumulative model was appropriate, with risk of overweight increasing with duration of full-time employment (measured in terms of data collection sweeps in full-time employment), and model fit analysis using a structured life course approach supported this empirically (See Section 3.5.2).

Table 4.5: Risk ratios (95% CIs) for overweight/obesity at 7 years by cumulative maternal full-time employment (9 months-7 years), unadjusted and adjusted for covariates

Full-time employment	Unadjusted RR (95% CI)	+ Covariates from birth to 9 months† RR (95% CI)
None	1.00	1.00
1 sweep	0.90 (0.76-1.06)	0.91 (0.78-1.07)
2 sweeps	1.21 (1.01-1.44)	1.23 (1.03-1.48)
3 sweeps	1.27 (1.03-1.58)	1.35 (1.07-1.68)
4 sweeps	1.41 (1.15-1.73)	1.52 (1.22-1.88)

† Pre-pregnancy bodysize, maternal age at birth, ethnicity, breastfeeding duration, smoking in pregnancy, timing of introduction to solids before four months of age, gender of baby, birthweight, lone parenthood, low household income, maternal highest qualification.

Cumulative full-time maternal employment was found to be associated with overweight/obesity; risk of overweight/obesity increased for two or more sweeps of full-time employment (Table 4.5). Adjustment for early life covariates did not attenuate this relationship, and the risk increased when taking into account early circumstances. As expected, no equivalent relationship for paternal employment and overweight was found. Further analyses showed the same relationship between cumulative maternal full-time employment and overweight at 7 years if household socio-economic circumstances measured in later sweeps were included. These findings may imply the need for additional support for families with working mothers to allow them to maintain a healthy lifestyle.

4.3.2 Limiting long-standing illness

Having a child with a limiting long-standing illness (LLI) is likely to have implications for mothers' ability (as the primary carer in most families), to initiate and maintain employment, and there is research evidence that the likelihood of maternal employment is lower in families with a child with a LLI. However, many studies in this area have been cross-sectional, with small, unrepresentative samples, and most originate from the United States (30, 33). The current analysis used longitudinal data to investigate mechanisms involved in the development of this association, and hypothesised that the likely causal direction would be that having a child with LLI may limit opportunities for a mother to maintain employment or for non-employed mothers to seek employment. Alternative explanations for the association between employment and LLI (that mothers in poorer families may be both less likely to be employed and more likely to have children with LLI, and that mothers with an LLI themselves may be both less likely to be employed and more likely to have children with LLI) were addressed by the inclusion of socio-economic and maternal LLI variables in multivariable models.

Cross-sectionally, MCS analyses showed that families where two parents were employed were less likely to have a child with an LLI at any data collection sweep, and that non-employed lone parents had the highest risk of having a child with an LLI. In terms of LLI and maternal employment, lower levels of employment were associated with childhood LLI. Longitudinal data were used to examine the nature of this relationship, based on consecutive sweeps of data on maternal employment and child LLI: 3 to 5 years and 5 to 7 years. The reference group for employment was "continuous employment", where the mother reported being in work at both sweeps (for 3-5 years or 5-7 years); for LLI, the reference was "No LLI", where there was no report of a limiting illness at either sweep (for 3-5 years or 5-7 years). Risks were adjusted for explanatory variables at the first sweep of each pair of sweeps: maternal age at cohort member birth, highest qualification, household income, family structure and maternal LLI.

Table 4.6: Risk ratios (95% CIs) for continuous non-employment associated with child continuous LLI

	3-5 years RR (95% CI)	**5-7 years RR (95% CI)**
No LLI	1.00	1.00
Child LLI at both sweeps (unadjusted)	1.48 (1.24-1.76)	1.50 (1.31-1.71)
Child LLI at both sweeps (adjusted†)	1.28 (1.09-1.51)	1.31 (1.15-1.50)

Table 4.7: Risk ratios (95% CIs) for leaving the labour market associated with child developing LLI

	3-5 years RR (95% CI)	**5-7 years RR (95% CI)**
No LLI	1.00	1.00
Child LLI only at the later sweep (unadjusted)	1.37 (0.95-1.98)	1.51 (1.02-2.24)
Child LLI only at the later sweep (adjusted†)	1.29 (0.89-1.86)	1.36 (0.92-2.01)

† Maternal age at cohort member birth, highest qualification, household income, family structure and maternal LLI

The results showed that, in comparison to children without LLI whose mothers were employed when they were aged 3-5 years or 5-7 years, children with continuous LLI were more likely to have a mother who was not employed, a risk that was not fully attenuated after adjustment for covariates (Table 4.6). Children with LLI reported at only the second of each pair of sweeps were more likely to have a mother who left employment, although this was a weak main effect and non-significant after

adjustment for covariates (Table 4.7). However, risk of a transition out of employment associated with the child developing an LLI was greater for lone mothers or mothers living in low income, particularly between 5 to 7 years (a significantly raised risk for lone parents: RR=2.77 (95% CI: 1.37-5.61)). The interaction between developing an LLI and lone parent status at 5 years was significant at the five percent level.

These findings suggest that having a child with an LLI limits opportunities to maintain employment or, for non-employed mothers, to seek employment, and the risk is attenuated but remains after adjustment for covariates. Having a child who develops an LLI is associated with exiting employment, particularly among low income and lone mothers, whose levels of paid employment are in any case lower. Such results suggest the need for additional support to enable employment for mothers in families with a child who has a LLI.

4.3.3 Socio-emotional behaviour

This analysis investigated the relationship between parental employment and problem behaviour at 7 years. There is scant evidence of any effect of paternal employment on child socio-emotional behaviour. Maternal employment has received greater research attention, although findings are mixed. Employment in a child's infancy has been linked to poorer socio-emotional behaviour (34). However, other studies have shown no relationship or fewer problem behaviours among children of employed mothers (31, 35).

Mechanisms through which employment status may affect child socio-emotional behaviour are likely to be complex. The increase in levels of employment within families conceals differing patterns of employment and non-employment, including movements into and out of the labour market. Furthermore, the impact of employment on child behaviour may differ depending on timing of employment, with suggestions both of sensitive early periods and that effects of early employment may be ameliorated by current circumstances. Non-employment could influence child behaviour positively through, for example, increased time for parental care, or negatively through reduced income and its impact on parental mental health and parenting behaviour. Employment usually increases income within the family and there is some evidence that maternal employment is particularly beneficial for the socio-emotional behaviour of children in lone parent compared to couple households (36).

The direction of any relationship between employment and child behaviour is not necessarily clear-cut. While the consequences of employment may influence behaviour, it is also possible that having a child who exhibits problem behaviour may prohibit use of childcare (particularly in the pre-school years), and limit employment opportunities. Using the longitudinal data from the MCS, we examined both the impact of parental (and maternal) employment trajectories on behaviour, and also whether prior behaviour predicted maternal employment transitions.

Trajectories of employment were derived across the four MCS sweeps, identifying patterns and culminating in status at 7 years, in order to differentiate potential effects of employment or non-employment over time and concurrent with the measurement of child socio-emotional problem behaviour at 7 years (using the Strengths and Difficulties Questionnaire (SDQ), described in Section 3.5.2). The trajectories of employment variable were validated using the structured life-course approach described in Section 3.5.2.

A number of variables that may influence the relationship between parental employment and child socio-emotional behaviour were identified. However, only those potential covariates that were associated with both the SDQ and employment, and significantly altered the association between employment trajectories and SDQ were included in the multivariable models: mothers' age at birth,

lone parenthood status, mothers' highest qualification, low household income and mothers' psychological distress were retained for multivariable analysis.
Analyses also investigated whether SDQ at an earlier sweep was associated with continuous maternal non-employment or transition out of employment, before and after adjusting for the covariates listed above.

The results showed that children from families where no parent was employed for one or more sweeps were at a greater risk of socio-emotional problem behaviour compared to those where a parent was continuously employed, even after adjustment for covariates (Table 4.8).

Given the consistently high levels of employment among fathers in the MCS shown in Section 4.1, paternal employment was not analysed separately but included as a covariate in analyses of maternal employment. Children of mothers who were continuously non-employed or experiencing periods of non-employment were at greater risk of problem behaviour compared to continuously employed mothers (Table 4.9). Adjustment for covariates fully attenuated the excess risk for children whose mothers had moved into employment by the time they were 7 years. In contrast, the elevated risk associated with continuous non-employment and a single transition out of employment was attenuated after adjustment for early covariates, paternal employment, household income and mothers' psychological distress at 7 years, but remained significant.

Further analyses of prior socio-emotional behaviour indicated that between 3 to 5 years, prior problem behaviour predicted maternal transition out of employment (unadjusted RR=1.46 (95% CI: 1.18-1.80)), although this association was fully attenuated following adjustment for the covariates. Similarly, between 5 to 7 years, the unadjusted relationship was significant (unadjusted RR=1.52 (95% CI: 1.17-1.99)), but was attenuated in the adjusted model.

These analyses suggest that having a parent in paid work is associated with better socio-emotional behaviour among children at 7 years, and any period in which there is no employed parent is associated with poorer socio-emotional behaviour. Further analyses focusing on maternal employment status similarly shows an association with child socio-emotional behaviour, but this is complex. Even after a prolonged period of non-employment, the risk of problem behaviour for children whose mothers made the transition into employment was no greater than among those with mothers in continuous employment. However, movement out of employment and continuous non-employment were associated with a higher risk of problem behaviour. Such results suggest that the relationship between employment and child socio-emotional behaviour may have both long-term and reactive elements, although the pathways involved may differ. While prior problem behaviour predicted maternal transition out of employment, this result was attenuated after adjustment for covariates.

4.3.4 Summary

In summary, longitudinal analyses were conducted to look at the relationships between parental or maternal employment and three child health and wellbeing variables selected as *exemplars* because they were hypothesised to have particular temporal associations with employment: overweight/obesity; limiting long-standing illness (LLI); and socio-emotional problem behaviour. For overweight/obesity, there was an elevated risk associated with long-term full-time maternal employment, which was not attenuated after adjustment. LLI predicted both non-employment at any sweep and a transition out of employment, particularly between ages 5 and 7 years, although associations were attenuated when adjusted for explanatory variables. Nevertheless, there was a suggestion that lone parents or those with low household income who had a child with a LLI were more likely to leave employment than other groups. For socio-emotional problem behaviour, there was evidence that parental (and maternal) non-employment in the period between infancy and 7 years was associated with raised risks of problem behaviour at 7 years. The association with parental

non-employment remained after adjustment for explanatory variables; for maternal employment, adjusted risks were elevated for children whose mothers were continuously non-employed or experienced a recent transition out of employment. An association between child behaviour and subsequent maternal transition out of employment was attenuated following adjustment for explanatory variables, suggesting that problem behaviour *per se* did not precede a movement out of the labour market.

Table 4.8: Risk ratios (95% CIs) for socio-emotional problem behaviour by parental employment status trajectories†, unadjusted and adjusted for early covariates and low household income and mothers' psychological distress at 7 years

	Unadjusted RR (95% CI)	+ Covariates from birth to 9 months‡ RR (95% CI)	+ Low household income at 7 years RR (95% CI)	+ Mothers' psychological distress at 7 years RR (95% CI)
Continuous employment	1.00	1.00	1.00	1.00
A single transition into employment	2.41 (2.00-2.91)	1.52 (1.20-1.92)	1.47 (1.16-1.87)	1.35 (1.07-1.70)
Multiple transitions, concluding in employment	2.17 (1.71-2.75)	1.60 (1.25-2.04)	1.55 (1.21-1.99)	1.39 (1.09-1.77)
Multiple transitions, concluding in non-employment	2.99 (2.36-3.80)	1.84 (1.43-2.36)	1.75 (1.34-2.27)	1.37 (1.06-1.78)
A single transition into non-employment	2.73 (2.28-3.27)	1.99 (1.65-2.39)	1.85 (1.50-2.28)	1.48 (1.21-1.81)
Continuous non-employment	3.47 (2.91-4.13)	1.99 (1.60-2.48)	1.84 (1.44-2.35)	1.45 (1.14-1.84)

†Continuous employment (at least one parent was employed at all sweeps); a single transition from a position where no parent was employed to where at least one parent entered the labour market; multiple transitions between employment and non-employment within the family during the first three sweeps, concluding in employment in the family at 7 years; multiple transitions between employment and non-employment during the first three sweeps, concluding in non-employment in the family at 7 years; a single transition from having an employed parent to having none; continuous non-employment (no parent employed at any sweep)

‡lone parenthood at 9 months; mothers' highest qualification at 9 months; mothers' age at child's birth

Table 4.9: Risk ratios (95% CIs) for socio-emotional problem behaviour by maternal employment status trajectories, unadjusted and adjusted for early covariates and paternal employment, low household income and mothers' psychological distress at 7 years

	Unadjusted RR	**+ Covariates from birth to 9 months†**	**+ Paternal employment (or no father figure) at 7 years**	**+ Low household income at 7 years**	**+ Mothers' psychological distress at 7 years**
Continuous employment	1.00	1.00	1.00	1.00	1.00
A single transition into employment	1.29 (1.05-1.59)	1.01 (0.81-1.24)	1.00 (0.81-1.24)	1.00 (0.80-1.23)	0.97 (0.79-1.20)
Multiple transitions, concluding in employment	1.24 (0.98-1.57)	1.06 (0.84-1.35)	1.06 (0.84-1.35)	1.06 (0.83-1.34)	1.01 (0.80-1.27)
Multiple transitions, concluding in non-employment	2.10 (1.67-2.64)	1.39 (1.09-1.78)	1.35 (1.05-1.72)	1.31 (1.02-1.68)	1.14 (0.90-1.45)
A single transition into non-employment	1.98 (1.57-2.51)	1.65 (1.30-2.08)	1.63 (1.29-2.05)	1.59 (1.26-2.01)	1.36 (1.09-1.71)
Continuous non-employment	2.61 (2.20-3.09)	1.58 (1.30-1.90)	1.48 (1.22-1.79)	1.43 (1.18-1.75)	1.26 (1.03-1.53)

†lone parenthood at 9 months; mothers' highest qualification at 9 months; mothers' age at child's birth

5 Qualitative Study

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5.1 Introduction

The NCB Research Centre was commissioned by the UCL Institute of Child Health to carry out a qualitative study exploring the links between parental employment and child health. The aims of the study were to:

- explore the mechanisms through which relationships between parental employment and child health arise
- draw out how policy and practice might use this information to promote child health.

5.2 Design and Methods

Data were gathered from in-depth interviews with parents between October 2012 and May 2013. The study was also informed by two NCB groups: the Families Research Advisory Group and the Young Researchers Advisory Group[1].

Approval for the research was obtained from the UCL ethics committee (Reference 2853/001).

5.2.1 The sample

The interview sample comprised 26 families (including one father and mother from the same family). In total, there were 25 mothers and two fathers from low income families with an annual household income below £25,000, most below £22,000. All had at least one child aged between 6 months and 7 years, and lived in London. Purposive sampling was used to obtain a diverse sample, as set out in Table 5.1 below.

[1] For more information see http://www.ncb.org.uk/research

Table 5.1: Profile of respondent characteristics

Criterion	Sample profile
Age of children	Five families[2] with pre-school age children only, 14 with school age children only, and seven with both pre-school and school age children.
Family size	Families of different sizes including nine with one child, eight with two children and nine with three or more children.
Care arrangements	Families had a range of care arrangements: 12 were using formal childcare (e.g. a nursery or childminder) and 12 had regular informal childcare (provided by family and friends). Eleven families were currently using neither.
Disability/ SEN	Five families included a disabled child or a child with special educational needs (SEN).
Ethnicity	Eighteen respondents were white, while nine were from ethnic minority groups (i.e. from Black British/ Black African, Asian and Mixed backgrounds).
Family form	11 respondents were lone parents, while 16 were from a dual parent family. Among the former, seven mothers had previously lived with the children's father.
Employment status	Six lone parents were in paid employment and five were not. In six dual parent families both parents were in paid employment, while in nine only one parent was in paid employment. There were no dual parent families where neither parent was in paid employment. Among the 11 respondents who were not working when interviewed, five had been in paid employment at some time since having children, and all but one had worked before having children.
Working hours	11 respondents were working part-time and five full-time.

5.2.2 Fieldwork and analysis

In-depth interviews explored:

- How mothers conceptualised child health
- Their efforts to safeguard children's health and any help they received
- How becoming a mother affected engagement in paid employment
- The relationship between child health and decisions about work
- What more could be done to help parents keep children healthy.

With respondents' consent, interviews were digitally recorded and transcribed verbatim. Participants were provided with £20 vouchers, to thank them for their contribution to the study.

The Framework option in NVivo10 was used to produce thematic summaries of the interview data, facilitating analysis within and between cases.

[2] A father and a mother from the same family were interviewed, so when counting families (rather than respondents) the total sample size is 26.

5.3 Main Findings

5.3.1 Parenting and child health

Children's emotional wellbeing was as prominent in parents' thinking as their physical health. Alongside happiness, key issues which dominated discussion were diet, exercise, development, confidence and social skills. Minor illness in childhood was considered normal, and health problems were evaluated in terms of the extent to which they caused distress, interfered with daily life, and were understood or under control. Challenges described by parents included fussy eating, sleep problems, and speech and language delay. In some cases, children were receiving extra help at nursery or school, though not all of them had Statements of Special Educational Needs.

Respondents were familiar with public health messages around nutrition and physical activity. They described making efforts to ensure their children had a balanced diet, and led an active life, though the costs of healthy food and taking part in activities were presented as barriers for some. 'Being there' for children was a recurrent theme, with mothers highlighting the importance of quality time to enable bonding with babies, provide security for older children, and support their learning.

Some mothers were more confident than others in relation to looking after children's health, though 'motherly instincts' were said to help. Even parents who described themselves as less confident recognised their expertise in relation to their own children.

Fathers' roles were portrayed as supportive rather than equal, particularly in relation to day-to-day oversight of children's health. There were exceptions, however. For example, one of the two fathers we spoke to dealt with health problems and doctors' appointments, and walked his children to school – although in his view, his partner was somewhat stricter over bedtimes and other health-related rules.

Most commonly, external advice and support came from women's mothers, who were credited with teaching 'proper' cooking and guiding them through health-related tasks, such as bathing, weaning and evaluating symptoms.

Some mothers reported benefitting from courses and advice provided by Children's Centres. These were also places where mothers met and exchanged tips and support with other parents - something they described as invaluable. Good nurseries, childminders and schools were also felt to promote children's health. In the main, this involved providing healthy menus, opportunities for exercise, and supporting children's learning and social skills, though provision of information to parents was also appreciated.

The extent to which respondents felt supported by health services varied. Health visitors' sensitivity and the trust they were able to inspire seemed to be an important factor, alongside any practical assistance they were able to offer. Although some described helpful, accommodating GPs, others recalled with considerable frustration having difficulty obtaining appointments or accessing specialist treatment.

5.3.2 How mothers reconcile their roles as parents and workers

Mothers' decisions about employment were influenced by whether and under what circumstances they believed a 'good mother' could share her responsibilities. Three themes emerged from respondents' narratives of how being a 'good mother' affected decisions about work or study:

- children's age and stage of development
- the acceptability of different carers
- the parenting tasks they were prepared to 'delegate', share, or hand over.

There was a consensus that, in the first year, full-time parental care was best for children. Past the age of one, mothers' narratives were more likely to be dominated by the perceived acceptability of different carers and how much time it was acceptable for a 'good mother' to be away from the children. Once they reached the age of three, it was accepted as the 'norm' for others to do more. The 'free time' that mothers had when children started pre-school was a clear trigger for some to think about employment.

Mothers' work decisions were strongly influenced by the availability of what they considered suitable childcare providers.

- **Fathers** were typically considered as good as mothers at caring for children, except where mothers described former partners as disengaged or violent. However, there were fathers whose working hours meant they did very little or no childcare, thus limiting mothers' own work options. Some families had 'shift parenting' arrangements whereby parents worked different hours so that one of them was always home to care for children, and for some, this was the only acceptable option. It also served to limit, or avoid, spending on formal care.
- **Grandparents** or other family members were seen as providing the 'next best thing' to parental care – usually free. They were trusted and it was considered desirable for them to bond with the children. The extent to which mothers relied on family care generally related to practical constraints, such as whether grandparents lived close by, had work or other caring commitments, or were physically fit.
- **Formal childcare providers** were viewed more favourably in some cases than others. Nursery classes[3] were consistently seen as providing stimulating early education whereas day nurseries and childminders were seen by some as services for working parents, and as not necessarily benefitting children. Other respondents believed there were 'good' and 'bad' day nurseries and childminders, and evaluated them using criteria such as the quality of interaction between children and staff, nutrition, hygiene and support for children's development.

Mothers who decided to use non-parental care to take up paid employment believed that the task of keeping children healthy could be shared with others, although how they did this depended on the child's age and the availability of 'acceptable' care providers.

The importance of secure bonds was emphasised by those relying on family carers, or occasionally childminders. Others described choosing formal childcare settings that demonstrated good practice in the above areas, while they also emphasised benefits for children in relation to socialising with their peers.

The conceptualisation of a 'good mother' was mediated by how paid work was viewed in relation to mothers' self-esteem, emotional wellbeing and financial independence. Mothers with a strong orientation towards work reported greater conflicts in balancing parenting with employment. Difficulties related to childcare costs, access to family-friendly jobs, sacrificing pay or status, and missing out on key developmental milestones. However, even among mothers who associated being a 'good mother' with staying at home, pragmatic factors, such as the cost and availability of childcare, played a part. This was not unexpected, given that families were all on low incomes and living in London where childcare costs are the highest in the country, childcare facilities are in short supply and family care is less likely to be available (37).

[3] Most 3-4 year olds receive early years education in these settings.

5.3.3 How decisions about work affect children's health

Mothers' narratives around employment and childcare decisions centred on 'doing the right thing' for their families. Some arrangements were seen as good for children, or 'fitting with their world', while others were stressful, but justified as ultimately beneficial, for example through increasing household income. Mothers described adopting strategies to combat problems associated with their decisions. If struggling financially because they were not working, they sought out free activities, or cheap but nutritious food; if unhappy with nursery menus, they provided a packed lunch.

Mothers saw more explicit links between parental employment and children's emotional wellbeing, compared to their physical health, though the experience of the parents of children with long term health problems was rather different. Indeed, for mothers of disabled children, providing care, liaising with services, and attending hospital appointments had limited the work they could do, or even ruled out paid employment altogether. Across the sample, it was largely felt that paid work was important for mothers' mental health and wellbeing, which impacted strongly on that of their children. Moreover, mothers' perceptions of what was good for children included having working role models, inspiring a work ethic and desire to achieve. However, the benefits of employment were contingent on successfully balancing work and family life. Essentially, this meant finding jobs that allowed mothers sufficient time and energy to fulfil their parenting role, without having to sacrifice too much in terms of pay, status or job satisfaction.

Although mothers were willing to talk about the challenges of both work and parenthood and occasions when things had not gone well, they felt that irrespective of the employment choices they had made, they had been the right choices for their children. It may be that those who felt they had not managed to balance these roles were less able or less willing to speak to us. We can only say that, in their interviews, mothers were positive about their roles as both mothers and (where they were employed) as workers.

5.4 Conclusions

While mothers varied considerably in terms of attitudes to and decisions about paid employment, they all saw protecting their children's health as key to being a 'good mother'. Accordingly, their choices were strongly influenced by what they believed children would benefit from or cope with. Parents expressed both internal and external pressures to see their childcare choice whether employment or otherwise, as favouring their children's health. Employed parents felt disappointed when their child carer failed to do what they considered to be the right thing in terms of the child's health. However, rather than setting out the relationship, as they saw it, between their employment decisions and child health, our interviewees were more likely to tell us about mechanisms by which they avoided employment/ unemployment impacting on their children's health and emotional wellbeing. The mother's own mental health/ stress/ self-esteem were cited as reasons both for working and for giving up work - with the effects on their child or children supporting their decision.

The extent to which children could benefit from maternal employment depended on mothers securing the right working and caring arrangements. Parents believed there was scope for improvement in relation to: financial support, enabling a parent to stay at home in a child's first year of life; ensuring parents can work flexibly and take time off when children are ill; and better and cheaper childcare facilities.

Whilst much of what they suggested in relation to family-friendly working is covered by employment legislation, our sample included many parents in a weak labour market position. Consequently, some seemed to be faced with a choice of: a) working arrangements that could result in high levels of stress for mothers and children; or b) not working or accepting a job which 'fitted with the children' but was at a lower level and less well paid than could be expected, on the basis of their qualifications and experience.

The experiences and suggestions of parents in our sample suggest that Children's Centres might be made more accessible to working parents and to those with children over the age of five. Second, with mothers describing limited information from childcare providers, there may be potential for nurseries and childminders to get more involved in public health promotion campaigns; this could be particularly beneficial at a time when free early education to disadvantaged two year olds is being considerably expanded. Third, opening hours in the health services might be made more flexible to assist parents in paid work.

5.5 Strengths and limitations

The present study was able to explore, in-depth, low-income mothers' narratives around the relationship between paid employment and child health, and to consider the implications for promotion of child health.

Difficulties recruiting fathers may to some extent reflect the emphasis on recruitment via schools and children's centres, but mothers also appeared more interested in the topic. As noted previously, while small, the sample was diverse in relation to a range of characteristics – with the exception of fathers, and we recruited only London parents. Because of the significant problems faced by parents of disabled children, our sample of two parents of disabled children and three whose children had mild special educational needs (SEN) does not sufficiently explore the challenges faced by these mothers and fathers.

5.6 Research recommendations

Future research could further develop our understanding of the relationship between parental employment and child health, and of how working parents can be supported to keep their children healthy. We recommend:

- Replicating this study focusing on fathers' role in supporting children's health, and the relationship between this role and paid work.
- Additional research with higher income families and with more geographically diverse samples to explore parents' experiences in different childcare and employment markets.
- Further exploring the links between health, wellbeing and parental employment from the perspectives of children and young people.
- Further exploring the links between health, wellbeing and parental employment for mothers and fathers of disabled children.
- Additional research on the associations between use of informal care and children's outcomes. Research to gain a better understanding of whether and how Children's Centres are used by working parents (both mothers and fathers), the potential benefits of making them more accessible to working families, and how this might be done.

6 Contribution to Consortium themes

6.1 Health inequalities

Quantitative analyses took into account markers of socio-economic circumstances for the cohort member's family from birth through to 7 years, and showed that these were important influences on relationships between employment status and child outcomes. Our qualitative work was with families on low incomes. Mothers with a strong orientation towards paid employment reported conflicts in balancing parenting with employment. Difficulties related to childcare costs, access to family-friendly jobs, sacrificing pay or status, and missing out on key developmental milestones. However, even among mothers who associated being a 'good mother' with staying at home, pragmatic factors, such as the cost and availability of childcare, also played a part.

6.2 Individual risk factors

A range of individual risk factors were included in quantitative multivariable analyses as appropriate, including household factors (including family structure and household income), maternal factors (including mental health), and child factors (including birthweight). The impact of these adjustments varied according to the outcomes considered. In addition, although referred to as outcomes for the purposes of the analyses presented, overweight and socio-emotional behaviour are also risk factors along a causal pathway leading to, for example, heart disease and diagnosed mental health disorders, respectively. In the qualitative work, whilst some parents were more confident than others in relation to looking after children's health, even those who described themselves as less confident recognised their expertise in relation to their own children. Most commonly, external advice and support came from women's mothers, who were credited with teaching 'proper' cooking and guiding them through health-related tasks, such as bathing, weaning and evaluating symptoms. There was a consensus that, in the first year, full-time parental care was best for children. Past the age of one, mothers' narratives were more likely to be dominated by the perceived acceptability of different carers and how much time it was acceptable for a 'good mother' to be away from the children. Once they reached the age of three, it was accepted as the norm for others to do more.

6.3 Living and working conditions

The focus of the project was on parental employment, particularly duration and intensity of work for mothers. The results of quantitative analysis showed that there was an association between employment status and child outcomes, although the nature of the relationship differed by outcome. The majority of our interviewees in the qualitative work were mothers, who largely saw childcare as their responsibility. Their employment decisions were influenced by whether and under what circumstances a 'good mother' could share childcare responsibilities, and they were strongly influenced by the availability of what they considered suitable childcare providers. While mothers varied considerably in terms of attitudes to and decisions about paid employment, they all saw protecting their children's health as key to being a 'good mother'. Mothers' narratives around employment and childcare decisions centred on 'doing the right thing' for their families. Some arrangements were seen as good for children, or 'fitting with their world', while others were stressful, but justified as ultimately beneficial, for example through increasing household income. Mothers described adopting strategies to combat problems associated with their decisions.

7 Conclusions

7.1 Pathways between parental employment and child outcomes

Policy initiatives in the UK for a number of years have encouraged parental employment as a means to reduce child poverty, and its associated health inequalities, and this may be at least in part explain an observed increase in the proportion of families where both parents are employed (or where there is an employed lone parent). Data from the MCS showed that paternal full-time employment levels were continuously high, whereas maternal employment levels increased at each data collection sweep, as the cohort child got older. The qualitative study illustrated mothers balancing employment flexibility, childcare availability, age of the child and being a good parent, as well as financial imperatives, when deciding whether to enter the labour market. Mothers' work decisions were strongly influenced by the availability of what they considered suitable childcare providers, formal or informal, and school entry was a trigger for some mothers to start employment. In the MCS, while both full and part-time employment increased among mothers, most worked part-time. By 7 years, the MCS children would have been attending primary school and therefore it was decided not to investigate the impact of childcare outside school as it would be impossible to disentangle the independent roles of wrap-around childcare and parental working hours.

Both cross-sectional and longitudinal analyses showed associations between parental employment and a range of outcomes, with generally worse outcomes for children who lived in families where no parent was employed, either in couple or lone parent households. Focusing on maternal employment, where there was an association with an outcome it generally showed a positive relationship, and this did not differ according to the intensity of employment (in terms of hours worked). An exception was overweight/obesity, where risks were greater among full-time employed mothers. Longitudinal data allowed further analyses to disentangle the direction of causation in the relationships, focusing on three outcomes for which the causal pathways were hypothesised to differ. The results did reveal differences between outcomes, as suspected, suggesting that there is value in choosing multiple outcomes and longitudinal data. Results for overweight/obesity showed that cumulative exposure to full-time maternal employment was associated with increased risk of overweight/obesity at 7 years. This finding may reflect lack of time (indirectly measured, through intensity of employment or hours worked) and its consequences for less healthy patterns of diet and physical activity in these families. For LLI reverse causation was suggested, with a child having an LLI associated with non-employment or a transition out of employment. Results for socio-emotional problem behaviour suggested both long-term and reactive elements of an association with parental and, specifically, maternal employment up to age 7.

The mechanisms through which these associations developed involved the socio-economic context of the family, although patterns varied by outcome. When analyses adjusted for socio-economic factors, the association between maternal full-time employment and overweight/obesity strengthened, suggesting that the association is not a consequence of poorer socio-economic circumstances. In contrast, adjustment for socio-economic circumstances attenuated relationships between parental and maternal employment trajectories and socio-emotional behaviour; for maternal trajectories, this was particularly the case for transitions into employment. For LLI, adjustment for socio-economic variables did attenuate the relationship with employment. However, there were also differences in the strength of associations between LLI and employment by lone parent status and low income, with higher risks of a transition out of employment among lone parent and low income households if their child developed an LLI. Explanatory factors were not identical between outcomes. For example, maternal mental health had a large effect in the analysis of maternal employment and child socio-emotional behaviour, which may reflect the impact of economic hardship on both parent psychological adjustment and child outcomes.

While quantitative research was able to describe associations at a population-level, including longitudinal analyses to investigate possible causal pathways, the qualitative research, described

above and in the fuller qualitative research report (Appendix 3), highlighted the realities that mothers have to negotiate when making employment decisions.

7.1.1 Strengths and limitations

There are a range of strengths and limitations related to the individual research elements included in the project. The project used quantitative and qualitative methods in order to gain a fuller understanding of issues around parental employment and child health and wellbeing than would be possible using quantitative or qualitative research alone. The MCS is a large, representative cohort of contemporary children, and the qualitative sample allowed more detailed understanding of the perceptions of low income parents about employment and child health. Despite these strengths, there were limitations. Quantitative analyses used employment status recorded at each sweep and could not investigate the full complexity of employment histories, and only focused on key outcomes for longitudinal analyses, in order to examine causal relationships between employment and each outcome. For the qualitative study, the results provided an in-depth exploration of the narratives on employment and child health from a diverse sample of mothers. However, there were difficulties recruiting fathers, and although parents of children with disabilities were included, there were fewer than we would have wished. The parents we interviewed were in London, where the cost of living and the cost of childcare are high.

7.2 Policy implications and suggestions for future research

The general pattern of results indicates that parental employment has a positive relationship with a range of child outcomes. However, a theme running through the research suggests that, without support, in particular high quality affordable childcare and flexible employment conditions, it is difficult to combine work and family life, or for healthy lifestyles to be maintained. This is even more the case where the main carer is employed full-time, and/or where the child has a long-standing illness, particularly if living in poverty.

Further quantitative research should continue to investigate parental employment and children's health as the MCS children get older and enter adolescence, including age-relevant outcomes. This could be augmented by research looking in more detail at the impact of key job characteristics (long full-time hours, unsociable hours, casualised work, and job quality) and comparative cross-national research.

Qualitative work might focus on children with serious or long-term health problems, and investigate fathers' perceptions on employment and child health (outlined in detail in Section 5.6). In addition, qualitative or ethnographic work may cast further light on associations found in the quantitative analyses, including with children and families where neither parent is in paid work, maternal full-time versus part-time employment, and the implications of childcare for provision of healthy lifestyles. The results from the quantitative research could be included in a knowledge exchange study: taking the findings to (1) policy (2) practice (3) mothers (4) fathers (5) young people who had experienced parental (un)employment might deliver informed speculation on mechanisms linking (un)employment with child outcomes.

A number of policy implications may be drawn from this research:

- Family employment (that is having a least one parent employed) is associated with favourable child health outcomes across a range of domains, suggesting that policies to facilitate employment within a family may have positive results.
- Maternal employment is generally associated with favourable child health outcomes, and there is little evidence to differentiate part-time and full-time employment for most outcomes. One exception is childhood overweight, for which risks are greater when both parents are employed full-time (reflected in the findings for maternal employment, given the backdrop of widespread full-time paternal employment). These findings suggest the importance of part-time work

options for mothers of young children, and greater flexibility in work hours and ability to take time off for both part-time and full-time employed parents.

- In terms of childhood overweight (which, if continued into adulthood, will have implications for later health), maternal full-time employment not only increases risks but undermines the otherwise protective effects of socio-economic advantage. This implies the need to consider how children are provided with healthy meals and adequate physical activity in formal and informal childcare and at school.
- Evidence showing that mothers are less likely to enter or maintain employment if they have a child with a limiting illness suggests that there needs to be special consideration of how to support the employment decisions of parents of children with a disability or long term illness. This includes not only policy on employment and benefits, but also wrap-around childcare once the child enters schooling, and improved availability of out-of-work-hours health, childcare and other services.

References

1. Organisation for Economic Co-operation and Development. Doing Better for Families. Paris: OECD, 2011.

2. Organisation for Economic Co-operation and Development. Babies and bosses: reconciling work and family life. A synthesis of findings from OECD countries. Paris: OECD, 2007.

3. Walling A. Families and work. Labour Market Trends. 2005.

4. Department of Work and Pensions. Working for Children. London: 2007.

5. Boeri T. The Lisbon Process and European women at work. 2005. Available from: http://www.iub.edu/~econdept/conference/boeripaper.pdf.

6. Waddell G, Burton A. Is work good for your health and well-being? Norwich: TSO, 2006.

7. Spencer N. Poverty and child health. New York: Radcliffe Medical Press, 1996.

8. Whitehead M, Burstrom B, Diderichsen F. Social policies and the pathways to inequalities in health: a comparative analysis of lone mothers in Britain and Sweden. Social Science and Medicine. 2000;50:255-70.

9. Crompton R, Lyonette C. Who does the housework? The division of labour within the home. In: A. Park CJ, Thomson K., Phillips M., Johnson M., Clery E., editor. British Social Attitudes 2007-2008. London: Sage Publications; 2008.

10. Brown R, Joyce L. New deal for lone parents: non-participation qualitative research. London: Department for Work and Pensions, 2007.

11. UNICEF. The childcare transition. In: UNICEF, editor. A league table of early childhood education and care in economically advanced countries. Florence: Innocenti Research Centre; 2008.

12. Duncan S, Edwards R. Single mothers in Britain: unsupported workers or mothers? In: S. Duncan ER, editor. Single mothers in an international context: mothers or workers? London: UCL Press; 1997.

13. Organisation for Economic Co-operation and Development. Education at a glance. Paris: OECD, 2006.

14. Joshi H, Davies H. Child care and mothers' lifetime earnings: some European contrasts (Discussion paper no. 600). London: Centre for Economic Policy Research, 1992.

15. Aldridge H, MacInnes T, Kenway P, Parekh A. Monitoring poverty and social exclusion 2012 (Accessed 11/11/2013). Available from: http://www.jrf.org.uk/sites/files/jrf/MPSE%202012%20Bookmarked%20REVISED.pdf.

16. Hawkins SS, Cole TJ, Law C. Examining the relationship between maternal employment and health behaviours in 5-year-old British children. Journal of Epidemiology and Community Health. 2009.

17. Hirsch D. What will it take to end child poverty? Firing on all cylinders. York: Joseph Rowntree Foundation, 2006.

18. Reinhardt Pedersen C, Madsen M. Parents' labour market participation as a predictor of children's health and wellbeing: a comparative study of five Nordic countries. Journal of Epidemiology and Community Health. 2002;56:861-7.

19. Cooksey E, Joshi H, Verropoulou G. Does mothers' employment affect children's development? Longitudinal and Life Course Studies. 2009;1(1):95-115.

20. Hurrell K, Davies K. Time use and childcare. Manchester: Equal Opportunities Commission, 2005.

21. Hawkins SS, Griffiths LJ, Dezateux C, Law C, Group MCSCH. The impact of maternal employment on breast-feeding duration in the UK Millennium Cohort Study. Public Health Nutrition. 2007;10:891-6.

22. Mindlin M, Jenkins RJ, Law C. Maternal employment and indicators of child health: a systematic review in pre-school children in OECD countries. Journal of Epidemiology and Community Health. 2009;63:340-50.

23. Office for National Statistics. Households and families. Households and families 2010.

24. Office for National Statistics. Labour market. Social Trends 2009.

25. Office for National Statistics. Work and family: half of mums of under 5's are in employment. Newport: ONS, 2006.

26. Office for National Statistics. Work and family: two-thirds of Mums are in employment. 2008. (Accessed 22/1/2010). Available from: http://www.statistics.gov.uk/cci/nugget.asp?id=1655.

27. Taylor-Robinson D, Gosling R. Local authority budget cuts and health inequalities. British Medical Journal. 2011;342:d1487.

28. Office for National Statistics. Working and Workless Households, 2013 Newport: ONS. Available from: http://www.ons.gov.uk/ons/dcp171778_325269.pdf.

29. Hawkins SS, Cole TJ, Law C. Maternal employment and early childhood overweight: findings from the UK Millennium Cohort Study. Int J Obes. 2008;32(1):30-8.

30. Kuhlthau KA, Perrin JM. Child health status and parental employment. Archives of Pediatric and Adolescent Medicine. 2001;155:1346-50.

31. McMunn A, Kelly Y, Cable N, Bartley M. Maternal employment and child socio-emotional behaviour in the UK: longitudinal evidence from the UK Millennium Cohort Study. Journal of Epidemiology and Community Health. 2011.

32. Mishra G, Nitsch D, Black S, De Stavola B, Kuh D, Hardy R. A structured approach to modelling the effects of binary exposure variables over the life course. International Journal of Epidemiology. 2009;38:528-37.

33. Hatzmann JH, Peek N, Heymans H, Maurice-Stam H, Grootenhuis M. Consequences of caring for a child with a chronic disease: Employment and leisure time of parents. Journal of Child Health Care. 2013.

34. Belsky J, Eggebeen D. Early and extensive maternal employment and young children's socioemotional development: Children of the National Longitudinal Survey of Youth. Journal of Marriage and the Family. 1991;53(4):1083-110.

35. Wills JB, Brauer JR. Have children adapted to the mothers working, or was adaptation unnecessary? Cohort effects and the relationship between maternal employment and child well-being. Social Science Research. 2012;41:425-43.

36. Harvey E. Short-term and long-term effects of early parental employment on children of the National Longitudinal Survey of Youth. Developmental Psychology. 1999;35(2):445-59.

37. La Valle I, Clery E, Huerta MC. Maternity rights and mothers' employment decisions. London: Department for Work and Pensions, 2008.

APPENDIX 1:

Adjusted† risk ratios for outcomes by concurrent parental employment status (page 1)

	9 months RR (95% CI)	3 years RR (95% CI)	5 years RR (95% CI)	7 years RR (95% CI)
Child physical health				
Maternal rating of child's general health [fair/poor versus rest]				
couple: both employed	-	-	1.00	1.00
couple: only father employed			1.63 (1.23-2.16)	1.84 (1.27-2.67)
couple: only mother employed			1.42 (0.59-3.40)	0.81 (0.25-2.59)
couple: neither parent employed			2.20 (1.53-3.16)	2.21 (1.27-3.83)
lone parent: employed			1.19 (0.74-1.91)	1.65 (1.08-2.53)
lone parent: not employed			1.73 (1.15-2.59)	1.84 (1.17-2.91)
Total			10956	9809
Limiting long-standing illness				
couple: both employed	-	1.00	1.00	1.00
couple: only father employed		1.23 (0.93-1.63)	1.42 (1.13-1.77)	1.64 (1.30-2.06)
couple: only mother employed		1.12 (0.50-1.01)	1.42 (0.66-3.03)	1.92 (1.10-3.34)
couple: neither parent employed		1.82 (0.44-2.89)	2.12 (1.48-3.04)	2.23 (1.51-3.30)
lone parent: employed		1.42 (0.84-2.42)	1.23 (0.87-1.73)	1.45 (1.07-1.95)
lone parent: not employed		2.39 (1.66-3.46)	2.04 (1.50-2.77)	2.33 (1.73-3.13)
Total		11686	10949	9803
Injury [versus no injury during this period]				
couple: both employed	1.00	1.00	1.00	1.00
couple: only father employed	0.98 (0.83-1.15)	1.03 (0.96-1.11)	1.01 (0.92-1.11)	1.00 (0.89-1.11)
couple: only mother employed	1.30 (0.78-2.15)	1.02 (0.85-1.23)	0.85 (0.65-1.11)	1.13 (0.86-1.49)
couple: neither parent employed	1.40 (1.04-1.89)	0.92 (0.81-1.05)	1.02 (0.86-1.20)	1.24 (1.03-1.49)
lone parent: employed	0.97 (0.64-1.45)	0.96 (0.85-1.09)	1.09 (0.98-1.23)	1.03 (0.90-1.19)
lone parent: not employed	1.26 (1.00-1.57)	1.08 (0.97-1.19)	1.01 (0.87-1.16)	1.06 (0.91-1.25)
Total	12671	11686	10949	9807
Overweight/obesity				
couple: both employed	-	1.00	1.00	1.00
couple: only father employed		0.90 (0.82-1.00)	0.86 (0.76-0.97)	0.94 (0.82-1.07)
couple: only mother employed		0.88 (0.66-1.17)	1.08 (0.80-1.47)	1.05 (0.76-1.44)
couple: neither parent employed		0.94 (0.77-1.14)	0.76 (0.60-0.97)	0.81 (0.64-1.02)
lone parent: employed		1.02 (0.86-1.21)	0.99 (0.85-1.15)	1.07 (0.92-1.25)
lone parent: not employed		0.89 (0.75-1.07)	0.92 (0.78-1.10)	1.06 (0.89-1.27)
Total		10792	10832	9634
Asthma				
couple: both employed	-	1.00	1.00	1.00
couple: only father employed		0.94 (0.82-1.08)	1.05 (0.92-1.20)	1.04 (0.91-1.18)
couple: only mother employed		0.84 (0.56-1.28)	0.74 (0.45-1.20)	0.99 (0.68-1.43)
couple: neither parent employed		1.24 (0.99-1.55)	1.03 (0.82-1.31)	0.99 (0.75-1.31)
lone parent: employed		1.08 (0.86-1.36)	1.20 (0.99-1.46)	1.07 (0.90-1.28)
lone parent: not employed		1.16 (0.94-1.44)	1.17 (0.96-1.43)	1.08 (0.90-1.30)
Total		11500	10914	9783

† MCS 1 (9 months) standard covariates: maternal ethnicity, highest maternal qualification; maternal age first live birth; lone mother at birth

Adjusted† risk ratios for outcomes by concurrent parental employment status (page 2)

	9 months (95% CIs)	3 years (95% CIs)	5 years (95% CIs)	7 years (95% CIs)
Fits				
couple: both employed	-	1.00	1.00	1.00
couple: only father employed		1.19 (0.92-1.53)	1.07 (0.82-1.38)	0.95 (0.72-1.25)
couple: only mother employed		0.94 (0.46-0.94)	1.24 (0.66-2.31)	1.63 (0.69-3.84)
couple: neither parent employed		1.55 (1.04-2.31)	1.33 (0.80-2.19)	1.46 (0.87-2.45)
lone parent: employed		0.63 (0.36-1.08)	1.32 (0.98-1.78)	1.35 (0.95-1.93)
lone parent: not employed		1.43 (0.97-2.09)	1.55 (1.06-2.28)	1.51 (0.99-2.30)
Total		11686	10951	9809
Partial or no primary vaccinations [vs. Fully immunised]				
couple: both employed	1.00	1.00	-	-
couple: only father employed	1.78 (1.39-2.29)	1.16 (0.88-1.54)		
couple: only mother employed	1.79 (0.96-3.34)	1.10 (0.51-2.38)		
couple: neither parent employed	2.48 (1.72-3.56)	1.41 (0.86-2.33)		
lone parent: employed	1.87 (1.11-3.12)	1.12 (0.70-1.81)		
lone parent: not employed	2.83 (2.03-3.95)	1.50 (0.99-2.27)		
Total	12661	11599		
No MMR vaccinations: [vs. Complete MMR immunisation (for particular sweep)]				
couple: both employed	-	1.00	1.00	-
couple: only father employed		1.11 (0.90-1.36)	1.28 (0.94-1.74)	
couple: only mother employed		1.07 (0.61-1.90)	1.81 (1.04-3.14)	
couple: neither parent employed		1.41 (0.99-2.00)	1.86 (1.05-3.28)	
lone parent: employed		1.27 (0.91-1.77)	1.81 (1.23-2.65)	
lone parent: not employed		1.68 (1.19-2.37)	2.48 (1.59-3.87)	
Total		11153	9420	
Child mental health				
Socio-emotional problem behaviour				
couple: both employed	-	1.00	1.00	1.00
couple: only father employed		1.19 (1.06-1.34)	1.34 (1.12-1.62)	1.32 (1.09-1.59)
couple: only mother employed		1.52 (1.18-1.95)	1.53 (0.92-2.54)	1.34 (0.79-2.29)
couple: neither parent employed		1.70 (1.46-1.97)	2.18 (1.70-2.79)	2.13 (1.64-2.76)
lone parent: employed		1.27 (1.04-1.54)	1.64 (1.28-2.09)	1.27 (1.01-1.60)
lone parent: not employed		1.62 (1.39-1.90)	2.39 (1.92-2.96)	1.92 (1.54-2.40)
Total		11113	10697	8102
Autism				
couple: both employed	-	-	1.00	1.00
couple: only father employed			1.46 (0.71-3.02)	2.65 (1.70-4.15)
couple: only mother employed			2.34 (0.57-9.56)	2.05 (0.69-6.09)
couple: neither parent employed			1.67 (0.48-5.76)	4.35 (1.84-10.29)
lone parent: employed			0.90 (0.35-2.31)	1.83 (0.92-3.63)
lone parent: not employed			1.91 (0.70-5.16)	3.65 (1.72-7.71)
Total			10952	9797

† MCS 1 (9 months) standard covariates: maternal ethnicity, highest maternal qualification; maternal age first live birth; lone mother at birth

APPENDIX 2:

Adjusted† risk ratios for outcomes by concurrent maternal employment status (page 1)

	9 months (95% CIs)	3 years (95% CIs)	5 years (95% CIs)	7 years (95% CIs)
Child physical health				
Maternal rating of child's general health [fair/poor versus rest]				
Not employed	-	-	1.00	1.00
Employed part-time			0.64 (0.50-0.81)	0.59 (0.43-0.80)
Employed full-time			0.63 (0.41-0.95)	0.79 (0.52-1.19)
Total			12261	11241
Limiting long-standing illness				
Not employed	-	1.00	1.00	1.00
Employed part-time		0.83 (0.66-1.04)	0.70 (0.59-0.84)	0.60 (0.49-0.72)
Employed full-time		0.71 (0.50-1.01)	0.58 (0.42-0.78)	0.65 (0.50-0.84)
Total		13922	12251	11235
Injury [versus no injury during this period]				
Not employed	1.00	1.00	1.00	1.00
Employed part-time	0.96 (0.84-1.11)	0.95 (0.89-1.01)	1.02 (0.94-1.10)	0.95 (0.87-1.05)
Employed full-time	0.90 (0.71-1.14)	0.99 (0.90-1.08)	1.00 (0.90-1.11)	1.06 (0.93-1.20)
Total	14094	13922	12252	11237
Overweight/obesity				
Not employed	-	1.00	1.00	1.00
Employed part-time		1.06 (0.97-1.15)	1.13 (1.02-1.24)	0.97 (0.87-1.07)
Employed full-time		1.19 (1.06-1.34)	1.25 (1.11-1.41)	1.26 (1.13-1.41)
Total		12751	12093	11002
Asthma				
Not employed	-	1.00	1.00	1.00
Employed part-time		0.96 (0.85-1.07)	0.96 (0.86-1.07)	0.95 (0.86-1.06)
Employed full-time		1.11 (0.94-1.30)	0.95 (0.82-1.10)	1.01 (0.89-1.14)
Total		13697	12217	11214
Fits				
Not employed	-	1.00	1.00	1.00
Employed part-time		0.80 (0.63-1.01)	0.85 (0.66-1.09)	0.89 (0.69-1.13)
Employed full-time		0.66 (0.46-0.94)	0.92 (0.66-1.29)	1.03 (0.76-1.39)
Total		13922	12256	11241
Partial or no primary vaccinations [vs. Fully immunised]				
Not employed	1.00	1.00	-	-
Employed part-time	0.61(0.48-0.76)	0.84 (0.68-1.04)		
Employed full-time	0.51(0.36-0.73)	0.84 (0.62-1.14)		
Total	14083	13801		
No MMR vaccinations: [vs. Complete MMR immunisation (for particular sweep)]				
Not employed	-	1.00	1.00	-
Employed part-time		0.82 (0.68-0.98)	0.78 (0.63-0.98)	
Employed full-time		0.92 (0.73-1.16)	0.70 (0.50-0.99)	
Total		13301	10533	

† MCS 1 (9 months) standard covariates: maternal ethnicity, highest maternal qualification; maternal age first live birth; lone mother at birth

Adjusted† risk ratios for outcomes by concurrent maternal employment status (page 2)

	9 months RR (95% CI)	3 years RR (95% CI)	5 years RR (95% CI)	7 years RR (95% CI)
Child mental health				
Autism				
Not employed	-	-	1.00	1.00
Employed part-time			0.69 (0.40-1.21)	0.34 (0.22-0.51)
Employed full-time			0.69 (0.34-1.41)	0.48 (0.29-0.77)
Total			12257	11227
Socio-emotional problem behaviour				
Not employed	-	1.00	1.00	1.00
Employed part-time		0.79 (0.72-0.87)	0.62 (0.54-0.72)	0.61 (0.54-0.70)
Employed full-time		0.73 (0.64-0.85)	0.78 (0.65-0.93)	0.77 (0.66-0.91)
Total		13160	11945	11007

† MCS 1 (9 months) standard covariates: maternal ethnicity, highest maternal qualification; maternal age first live birth; lone mother at birth