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Abstract

Providing mothers with access to paid parental leave may be an important public policy to improve child and maternal health. Using extensive information from the Australian Longitudinal Study of Children (LSAC), we contribute to the literature by estimating the effect of paid parental leave entitlements on child health up to age seven. Exploiting detailed information on children's health, family background, mothers' pre-birth work histories and mothers' health behaviours during pregnancy within a propensity score matching framework, we show that paid parental leave entitlements reduce the probability of a child having multiple ongoing health conditions, but do not significantly affect any single condition. We find that the effect on multiple conditions is strongest for children from lower socio-economic backgrounds. Our study implies that the provision of paid parental leave, even for short periods (as usually available in Australia), will benefit children's health.

JEL classification: I1

Keywords: Child health, parental leave, Australia, LSAC

1 Introduction

Improving children's health is an important public policy issue. Not only is child health important in its own right, but recent research stresses the importance of child health for adult outcomes. For instance, Currie (2009) and Case and Paxson (2010) show that early child health can affect educational attainment and labour market outcomes later in life and Currie et al. (2010) find that the effect on schooling outcomes works primarily through future health outcomes. This finding is consistent with the framework by Cunha and Heckman (2007) who hypothesise that child health dynamically interacts with other forms of human capital in the process of human capital accumulation. Thus, public policy may be able to improve children's long-term educational outcomes, occupational choices, and future incomes by addressing early child health inequalities.

Parental leave schemes are one public policy tool that could directly impact on children's health for different reasons. First, parental leave could increase the amount of time a child spends with her parents instead of other informal or formal carers. Depending on whether parents provide better care than other carers, the amount and quality of time spent together may have positive or negative effects. Second, parental leave rights often specifically aim to decrease parental stress levels by increasing income and job security to alleviate parent's worries about their future career or their ability to financially provide for their family. If parental leave indeed reduces parental stress, parental health might benefit (Chatterji and Markowitz, 2005) and the quality of time the infant gets to spend with their parents may also improve Finally, since breastfeeding correlates with improved child health outcomes (World Health Organization and Unicef, 2003), parental leave rights might improve child health through prolonged breastfeeding.

However, only very few studies examine whether parental leave entitlements affect child health. Using aggregated macro data and between-country variation in parental leave schemes, studies such as Winegarden and Bracy (1995), Ruhm (2000), Tanaka (2005), and Engster and Stensöta (2011) find positive associations between parental leave rights and child health, but also stress the need for evaluations based on micro-data. We know of only three recent studies using micro-data to examine the effect of parental leave on child health. Similar to our approach, Berger et al. (2005) use propensity score matching and find a negative effect between early return to work and some child health outcomes, including immunisations, in the US. Exploiting a Canadian reform in paid parental leave rights, Baker and Milligan (2008) combine a regression-discontinuity with a difference-in-difference design and find no consistent effect on child health, but show that the reform increased the duration of breastfeeding. Third, Rossin (2011) evaluates the effects of unpaid leave in the US (Family and Medical Leave Act). Using a difference-in-difference strategy, the study finds small positive effects mainly for college-educated and married women who spend more time at home during the first few months of their child's life.[1]

The purpose of this paper is to examine the causal effect of paid parental leave on different measures of child health in Australia. We extend and contribute to the literature in several ways. First, we provide new evidence for the effect of paid parental leave on child health outcomes in the first 7 years after birth. Second, we provide a detailed analysis of the transmission mechanisms that may account for the effect of parental leave, such as breastfeeding, child care arrangements, and parental health. Finally, since the utilisation of paid parental leave rights is likely to vary across education levels and income groups, we examine more closely how parental leave rights impact on children's health for heterogeneous groups. Moreover, the difference in care quality may depend on parental income and education which largely determine parents' financial resources to afford care services. Education and income might also affect which transmission mechanisms account for the effect on health. We explore such heterogeneities to determine which groups might benefit the most from paid parental leave legislation.

To identify the effect of paid parental leave on child health in the absence of a reform, we

[1]Another recently emerging strand of the literature evaluates the effects of parental leave rights on long-term education and labour market outcomes, e.g., Baker and Milligan (2010), Liu and Skans (2010), Rasmussen (2010), Carneiro et al. (2011), Dustmann and Schönberg (2012), Danzer and Lavy (2013). These studies usually find no or only modest effects for children's outcomes, except for Carneiro et al. (2011) who find a positive effect of a Norwegian reform in 1977 on earnings at age 30. The main mechanism appears to be an increase in the time spent by mothers with their children.

have to exploit within-cohort variation in paid parental leave coverage. To address selection bias, we apply a propensity score matching approach that exploits exceptionally rich information from the Longitudinal Study of Australian Children (LSAC) on children's health outcomes, at birth and at later ages, together with mothers' and families' characteristics, and pre-birth employment histories. Most importantly, we have rich information on mothers' health behaviours during pregnancy and the children's health at birth, which we use as proxies for mothers' expectations about and preferences for their children's health. If uncontrolled, these could be a major confounding factor in selection into paid parental leave eligibility. Such detailed information is not commonly available in most datasets, yet is crucial in our study to overcome most of the bias that would otherwise result from unobserved heterogeneity. We examine children's health outcomes at ages one, three, five and seven. Our results are very similar to the results of Baker and Milligan (2008). There is no consistent pattern in the effect of paid parental leave rights on a child's risk of suffering from any specific condition; however, paid parental leave rights substantially reduce children's risk of suffering from multiple health conditions. The effect is stronger for children from a lower socioeconomic background, measured in terms of parental education, and it lasts well into a child's first years of school. On the other hand, our analysis of the transmission mechanisms yields no clear answer to the question where the advantageous health effect stems from: although paid parental leave substantially increases breastfeeding duration, this cannot explain the improvement of children's health. Furthermore, parental health or child care utilisation also appear not to explain the effect.

The paper proceeds as follows. In section 2 we discuss the institutional framework governing parental leave legislation in Australia. Section 3 discusses the data and variables used in the analysis, and presents some descriptive statistics. Section 4 presents the empirical framework. Section 5 presents and discusses the main results. We conclude and discuss the paper's policy and general implications in section 6.

2 Institutional framework

Similar to other OECD countries, Australia provides two types of parental leave to support parents of new-born babies. Since the introduction of the *Workplace Relations Act 1996*, all parents who are the primary carer of a new-born baby can claim up to 12 months of unpaid leave. The scheme entitles all employees, who were continuously employed with the same employer for a minimum of twelve months before giving birth, to unpaid parental leave and a return to their previous (or a comparable) position afterwards. Unpaid leave entitlements are thus near universal for working women, with no regional variation in coverage in the period of analysis for this study (i.e. after 2003). Mothers' pre-birth employment histories almost exclusively drive individual variation in eligibility.

Second, some parents can claim paid leave that also provides job protection, but additionally replaces some income during the period of leave taking. At the time the children included in this study were born (in 2003), paid parental leave was up to the employer and employee to negotiate.[2] As a result, paid parental leave provisions are more likely to be granted to high-paid and highly educated parents. The Workplace Gender Equality Agency (WGEA) reports that 51.7% of employers provided some paid parental leave to some of their employees with an average duration of 9.7 weeks in 2012 (WGEA, 2013).[3] In 2003, only 36% of employers had provided paid leave (Equal Opportunity for Women in the Workplace Agency, 2010).[4] Coverage varies greatly across industries: in 2012, from 89.3%-coverage in electricity, gas, water and waste services to 17.2% in accommodation and food services. The average duration of leave, in case any is provided, is more uniform across industries; with the lowest average duration being 7.3 weeks in agriculture, forestry and fishing, and the highest average duration of 13.0 weeks in education and training (WGEA, 2012). While this is a short period of paid leave, in particular compared to most European countries, it facilitates - in combination with available

[2]Only employees in the public sector were legally entitled to paid leave, although provisions vary across states.

[3]The numbers refer to organisations with 100 employees or more.

[4]In 2011, Australia introduced a universal paid parental leave scheme funded by the Australian government that pays 18 weeks of minimum wage and was meant to complement the employer-paid parental leave. However, the recent timing and limited data availability mean that longer-term health effects cannot be evaluated yet.

unpaid leave - in many cases breastfeeding up until 6 months, the age recommended by the World Health Organisation, which may be important for children's long-term health outcomes.

3 Data and descriptive statistics

3.1 Data and sample

We use data from the Longitudinal Study of Australian Children (LSAC) that started in 2003 and follows two cohorts of children over time (a 'child cohort': i.e. children aged 4-5 in 2003, and an 'infant cohort': i.e. children aged under 12 months in 2003). LSAC biennially documents children's physical, social and cognitive development together with a broad range of factors that impact on children's development (for details, see Soloff et al., 2005). LSAC interviews the children's parents and contains exceptionally rich information on the parental socio-economic background, the broader family environment, parenting and health behaviours, type and quality of care arrangements, the children's activities, the children's health status, and nutrition. To identify the effect of paid parental leave from birth onwards, we restrict our analysis to all children in the infant cohort whose primary carer participated in Wave 1.5[5], which collects information on leave taking and the last pre-birth job.[6] We follow these 3,549 children from wave 1 to wave 4; the children are thus 0 to 1 year old at the time of the first interview, and 6 to 7 years at the time of the last interview.

Since the provision of unpaid leave is near universal, conditional on pre-birth employment, we cannot disentangle the effects of unpaid parental leave from the effects of the past labour market history. We thus exclude children from the analysis whose mothers had not been working for the same employer in the twelve months before birth. This restriction reduces the sample of analysis to 2,234 children. We therefore estimate the effect of eligibility for *paid* parental leave compared to the benchmark of having only unpaid leave entitlements, rather than no

[5]Information on 24 children who do not live with their mother is discarded.

[6]Wave 1.5 is a mail-out questionnaire between Wave 1 and Wave 2. The questionnaire does not directly ask about leave entitlement, but rather whether and what type of leave the mother took or did not take, as well as her reasons for doing so. From these questions, it is possible to derive whether a mother was entitled to paid leave independent of whether she used the entitlement. This procedure is described in detail in Hanel (2013).

leave entitlements at all, conditional on relatively stable employment prior to birth. If policy makers introduced a universal paid parental leave scheme for mothers with shorter tenure, or for mothers not working prior to birth, the effects could be different. However, since parental leave programs around the world typically target the population of *working* mothers, the effects of paid leave rights we identify for this group are of particular policy relevance, and are arguably of greater interest than an overall population effect.

We further restrict the analysis to children with non-missing values on health outcomes and on the socio-economic and health control variables, leaving us with 1,858 children to follow over time. 1,014 of those had mothers who were eligible for paid parental leave.

3.2 Child health outcomes

LSAC contains detailed self-reported information about specific ongoing health conditions of the child. Since LSAC records *current* conditions, the prevalence of some of these conditions is quite low. Furthermore, LSAC documents whether children have had any respiratory problems in the past twelve months. Given how child health conditions develop over time, certain conditions become more or less common, and the conditions recorded in LSAC therefore change over time. We hence report the prevalence of most conditions in the descriptive analysis, whereas we focus on hearing problems and ear infections as well as respiratory conditions in the regression analysis. In addition, we examine two general indicators: an indicator variable for whether the child has any ongoing health condition, and another indicator variable for whether the child has multiple ongoing health conditions.

Table 1 presents the descriptive results, separately by eligibility of the mothers for paid parental leave. In all waves, the children with eligible mothers are less likely to have any of the specific health conditions, less likely to have any health condition at all, and less likely to have multiple health conditions.[7] For most of the conditions, the difference is small and statistically insignificant. However, a marked and statistically significant difference between both groups

[7]There is one exception to this finding: recurrent abdominal pain is slightly more frequent among children whose mothers were eligible for paid parental leave, albeit insignificantly so.

of children is found in all waves for the probability of having multiple conditions (at the 5%-level), and in waves 2 to 4 for the probability of having ear infections (at the 10%-level). In addition, children with eligible mothers have lower rates of chest problems, i.e., wheezing and asthma. These latter results are consistent with Baker and Milligan (2008) who also find that mothers' access to paid parental leave specifically reduces the risk of respiratory conditions, including asthma, and ear infections. While multiple conditions are markedly less common in children whose mothers had access to paid parental leave, the probability of having just one health condition differs less between groups. The descriptive statistics imply that while paid parental leave rights do not greatly affect the common situation of having some illness, leave entitlements appear to reduce the risk of being more seriously unwell.

3.3 Control variables

However, since access to paid parental leave is not random, these raw differences cannot be interpreted as the causal effect of paid parental leave on child health . As discussed in section 2, mothers who are eligible for paid parental leave receive higher pay, have higher education, and work in different industries and sectors prior to birth. Socio-economic characteristics, such as education, might have a direct effect on their children's health separate from the effect of paid parental leave. Unionisation and employers' characteristics might provide access to other family policies (e.g. flexible working hours), which might be advantageous to children's health in their own right. Finally, preferences for jobs providing access to paid parental leave might correlate with other preferences, such as preferences for investments in health, which could directly affect their children's health. We deal with these confounding factors by adding a very extensive range of control variables when estimating the effect of paid parental leave on children's health. LSAC provides an extensive range of pre-birth information that correlate both with child health and a mother's eligibility status; we use this information to make a 'selection on observables' identification strategy plausible.

Our control variables are all measured prior to birth and can be grouped in three blocks. Specification 1 includes socio-economic characteristics of the parents such as age and education, salary, working hours (pre-birth), marital status, whether they were in a long-term relationship at the time of conception, age at first birth, and the presence and age of other children. These characteristics, which also reflect time preference rates, impact on the mothers' and the families' capacity to make investments in their children's health. Specification 2 adds controls for mothers' health behaviours and health outcomes during the pregnancy, such as doctor visits, consumption of alcohol or tobacco, diabetes during pregnancy, and birth-related variables. These variables reflect the stock of the mothers' health capital and preferences for health investments (e.g. risk preferences), and are likely to correlate with child health and the probability of choosing a job that provides access to paid parental leave. Including these characteristics, which are not commonly available in most datasets, eliminates a major cause of potential bias arising from selection into treatment. Specification 3 adds variables that directly impact on her probability of receiving paid parental leave: firm size, whether the employer is in the public sector, and whether the mother is unionised. At the same time, these factors may increase a mother's probability of having access to other desirable family policies. Table 2 shows the raw descriptive statistics for the full set of control variables.

For most health indicators during pregnancy, no statistically significant differences are observed between eligible and ineligible mothers. Furthermore, more advantageous health status or health behaviours do not strongly correlate with eligibility status. For example, eligible mothers are less likely to consume tobacco during pregnancy, but report consuming more alcohol during pregnancy than their ineligible counterparts. The ambiguous patterns that are observed indicate that the child's inherited health status and parental health preferences do not correlate strongly with maternal eligibility for paid parental leave. Any selection bias from endogenous sorting into jobs that offer paid parental leave rights towards mothers with higher *preferences* for health investments thus appears to be of less importance than one might think a priori.

However, differences in available resources and thus parental *ability* to invest in a child's health across the two groups of mothers become apparent when comparing the characteristics of their employers: mothers who are entitled to paid parental leave are about 51% (76%) more likely to have worked for an employer with more than 100 (500) employees prior to birth than mothers without such an entitlement. Eligible mothers are more than twice as likely to be unionised, and more than three times as likely to have worked in the public sector. These stark differences in employer characteristics imply that a mother with access to paid parental leave might also have access to other, better family-friendly workplace policies than a mother who does not enjoy paid parental leave provisions.[8] To the extent that such policies have a direct effect on children's health, it is crucial to control for these personal and employer characteristics when estimating the effect of paid leave rights on children's health.

3.4 Transmission mechanisms

Consider a basic child health production function of the form $health_{it} = F_i(inputs_{it})$. Paid parental leave could affect child health either by changing the *inputs* a child receives, or the infants' ability to convert inputs into health ($F_i(.)$). In this paper we examine three mechanisms that determine a child's health inputs or production function and could thus affect child health.

First, Baker and Milligan (2008) show that mothers' delayed return to work increases the uptake and duration of breastfeeding which correlate positively with children's immune system and development (Armstrong and Reilly, 2002; Odijk et al., 2003; Kramer et al., 2008).[9] Figure 1 shows the distribution of breastfeeding duration for mothers with and without access to paid parental leave. In both groups, a breastfeeding duration of three months is most common. However, compared to mothers without access to paid parental leave, mothers with access to paid leave are substantially more likely to breastfeed between six and twelve months, and less likely to breastfeed less than six months.[10] We add controls for the duration of breastfeeding in the empirical analysis to investigate this pathway.

Second, we add controls for parental health that might affect both the inputs and production

[8] We cannot include a control for industry in the last pre-birth job due to a large number of missing values.

[9] A large body of medical literature examines the effects of breastfeeding, but most studies use within-cohort comparisons between mothers who do and mothers who do not breastfeed and hence are likely to suffer from selection bias. The literature on the causal link between breastfeeding and child health is sparse, e.g., see Kramer et al. (2001), or Der et al. (2006).

[10] This is confirmed in Table A.1 which shows that at all ages, children of eligible mothers are more likely to still be breastfed than children of ineligible mothers, with the largest difference in the probability of being breastfed past six months after birth.

function. For instance, extended parental leave may improve parental health (physically and mentally) by reducing stress, or it might improve the relationship between the parents and in turn their health. Moreover, less stress after birth might potentially intensify the bond between parents and children. Alternatively, parental leave may improve the child's long-term ability to cope with health risks in their environment, rather than improving the environment the child lives in. A range of early parenting behaviours might be improved if stress levels are reduced, from social interactions with the child to healthy feeding practices.[11] To account for parental health, we include indicator variables for mothers' and fathers' physical and mental health in the years after birth.[12]

Third, a long-term change in the environment (inputs) might occur because paid parental leave increases the time mothers spend at home with their children. This may change parents' preferences away from non-parental child care. To the extent that out-of-home care may expose a child to greater health risks, increased levels of parental care could improve children's health. To explore this potential transmission mechanism, we include some control variables for non-parental care utilisation. For instance, LSAC collects information on whether a child was looked after by anyone else than the main carer or that carer's partner at regular times.[13] We also control for the intensity of utilisation, measured as the total number of hours of child care per week.

4 Empirical strategy

In the absence of a natural experiment, we follow a 'selection on observables' identification strategy. We use standard ordinary least squares (OLS) for our benchmark estimates, but also

[11]Postnatal depression, which may be seen as an extreme case of maternal 'stress', has been shown to negatively impact on parenting, feeding and interactions (Murray and Cooper, 1997; Beck, 1998; Cooper and Murray, 1998).

[12]The physical health indicators include dummy variables whether the mother/the father rate their own health to be 'very good' or 'excellent' versus 'poor', 'fair, or 'good'. Mental health is measured by the 'Kessler k-6 Depression Scale'. This scale is based on six items that describe a person's mental health status, each measured on a scale from 1 to 5 and uses the average response to combine the items in a single, continuous index. The items describe how often in the past four weeks a person felt i) nervous, ii) hopeless, iii) restless or fidgety, iv) worthless, v) that nothing could cheer them up and vi) that everything was an effort.

[13]The care could be provided at a day care centre, by a family day carer or a nanny, or by grandparents or other relatives including a parent living elsewhere. It also includes care provided by mobile care units, occasional carers, or carers at a gym, leisure or community centre.

apply a propensity score matching approach (Rosenbaum and Rubin, 1983, 1985) to estimate the effect of paid parental leave on child health. Compared to OLS, matching techniques have the advantages of being more flexible, less prone to functional form misspecifications, and of ensuring common support between the treatment and control groups. However, both approaches rest on the key identifying assumption that we remove selection bias by controlling for all relevant characteristics that determine both paid leave eligibility and child health.

We start out by estimating the following model for each health outcome variable:

$$health_{it} = \alpha + \beta eligp_i + \gamma X_i^s + \epsilon \tag{1}$$

where $health_{it}$ refers to the health outcome of child i at time t, $eligp_i$ is an indicator variable equal to one if the mother is eligible for paid parental leave, and zero otherwise. We estimate three different specifications of the model (corresponding to specifications 1-3 discussed in Section 3.3) using vector X_i^s ($s \in 1, 2, 3$) which contains different control variables determined prior to giving birth .

In addition to OLS, we use a propensity score matching approach. We estimate the propensity score using a probit model:

$$p(X_i^s) \equiv Pr(eligp_i = 1|X_i^s) = E(eligp_i|X_i^s) \tag{2}$$

where $p(X_i^s)$ denotes the propensity score defined as the probability of being eligible for paid parental leave conditional on the pre-treatment characteristics X_i^s. The propensity score allows us to compare the realised health outcomes for children of mothers with similar propensity scores, but who differ in their eligibility for paid parental leave. We compute the 'average treatment effect on the treated' (ATT) as the difference in mean realised child health outcomes weighted by the propensity scores (Caliendo and Kopeinig, 2008):

$$\tau^{ATT} = E_{P(X_i^s|eligp_i=1)}(E[health_{it}|eligp_i = 1, P(X_i^s)] - E[health_{it}|eligp_i = 0, P(X_i^s)]) \tag{3}$$

The available matching estimators differ in the weights assigned to the control units. Facing a trade-off between bias and efficiency, we use kernel-based matching (Heckman et al., 1998) as our preferred matching algorithm. Intuitively, kernel-based matching calculates a smoothed weighted average giving more weight to non-treated units that are more similar to the treated unit in terms of the propensity score.

To meet the identifying assumption, we match on all characteristics shown in Table 2. Kernel-based matching produces excellent results in balancing the sample, as shown in Table 3.[14] Out of the 80 included indicators, only one shows significant differences in the sample of eligible and ineligible mothers on the 5%-level, another three have p-values around 10%. After the matching, the samples of eligible and ineligible mothers no longer differ systematically in personal characteristics or in employer characteristics, and mothers in the two groups are even less different in terms of their health during the pregnancy than they were before the matching. Using this matched sample, we can calculate a reliable estimate of the effect of paid parental leave provisions on children's health for the treated group.

5 Estimation Results

Table 4 shows how paid parental leave rights reduce the probability of a child suffering from adverse health conditions, compared to children whose mothers are not eligible for paid parental leave. Each row presents six estimates for the effect of paid parental leave eligibility on a child health outcome. The estimates in the first three columns present results from equation (1), changing the set of regressors corresponding to specifications 1-3. Columns four to six repeat the estimation using kernel-based propensity score matching and gradually control for the same three sets of control variables. All models are estimated separately for each wave and each health outcome. Importantly, the point estimates for all conditions are remarkably stable across estimation methods and specifications. However, standard errors naturally increase for

[14] Importantly, the condition of common support is fulfilled across the entire distribution. To further improve results, we follow Smith and Todd (2005) and trim 5% of the sample. The trimming procedure removes eligible mothers from the sample who are in intervals where the density of the propensity score for eligible mothers differs most strongly from the density of the propensity score for ineligible mothers.

the matching estimators due to their greater flexibility, thereby reducing significance levels.

The regression results confirm that in all waves, except wave 2, paid parental leave significantly reduces the probability of suffering from multiple health conditions. For children aged 0 to 1 year (Panel A), the estimated effect varies between 2.5 percentage points (pp) and 3.4pp, and is significant at the 1%-level or 5%-level for all specifications. Two years later, when children are 2 to 3 years old, the estimated effect decreases to around 1.2pp to 1.9pp and is estimated less precisely, becoming insignificant.Another two years later, when children are 4 to 5 years old , the estimated effect of having had paid parental leave rights after the child's birth becomes more pronounced again and is significant for all specifications at the 1%-level. At that age, the risk of suffering from multiple health conditions is reduced by 4.7pp to 6.8pp if the child's mother was eligible for paid parental leave after birth. Again, two years later (Panel D) we estimate a reduction of between 3.6pp and 4.7pp across estimators, while being significant at either the 5%- or 10%-level.

We also examine whether any specific health condition drives the main effect. Overall, the estimated effects vary more strongly across ages and estimators, and turn virtually to zero for a number of health outcomes. Consistent with Baker and Milligan (2008), we find evidence that paid parental leave rights appear to reduce the incidence of ear infections at the age of 2-3 and at the age of 4-5. However, the protective effect on ear infections is only slight and it disappears by the time children are aged 6-7. Similarly, there is some weak evidence for a reduction in the occurrence of diagnosed asthma at age 2-3, but not at other ages. There is also weak evidence for a reduction in vision problems which is strongest at age 4-5 but still present at age 6-7 as well.

Our analysis provides substantial support for the hypothesis that paid parental leave rights reduce the risk of suffering multiple health conditions, while the more common situation of having just one health condition is less strongly affected. Overall we do not find a clear effect for other specific conditions, or for the risk of suffering from at least one condition at any point in time. Although we cannot precisely identify the specific conditions behind the effect for multiple conditions, we find some weak evidence that ear infections/respiratory conditions/vision problems may contribute to this effect.

5.1 Transmission mechanisms

We have shown that paid parental leave rights positively impact on children's health. In this section we explore whether the three sets of transmission mechanisms from section 3.4 may mediate the effect of paid parental leave rights. To disentangle the different factors, we add control variables that represent possible transmission mechanisms to our preferred specification (3)[15] in three steps. If those variables indeed form (part of) the reason why paid parental leave rights improve children's health, the estimated effect of paid parental leave itself should decrease or disappear when such control variables are added to the estimation.

Adding controls for breastfeeding, the second column of Table 5 shows that the estimated effects of paid parental leave rights on child health remain virtually unchanged (compared to column 1, which is based on specification 3 in Table 4 but estimated on the same sample as in columns 2 to 5 of Table 5). This finding suggests that other factors, uncorrelated with breastfeeding duration, drive the measured effect.

In a second step, we explore the role of parental health and add controls for measures of mothers' and fathers' physical and mental health in the years after birth: self-rated health and the 'Kessler k-6 Depression Scale'. Adding those variables for parents' health to the estimation does not change the estimated effect of paid parental leave rights on child health by much, indicating that parental health does not explain the measured effect.

In a third step, we test for child care utilisation as a driving force behind the phenomenon. We add indicators whether a child had a child care arrangement in the past month, whether this was a formal arrangement at a day care centre, and how many hours per week the child spent in care arrangement outside the family. Again, adding these indicators to the estimation has no impact on the estimated effect of paid parental leave rights on children's health.[16]

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[15]This specification includes the full set of controls, but applies OLS instead of the matching estimator. In the face of very stable point estimates across models for the full sample, we accept the slight decrease in flexibility of the functional form when using OLS instead of the matching estimator.

[16]Although there are good theoretical reasons to assume a priori that the proposed transmission mechanisms will impact on children's health, empirically we find them to have relatively weak explanatory power - not only

Our analysis provides no evidence that any of the three examined transmission mechanisms explain the improvement of children's health caused by paid parental leave rights. Our analysis implies that improved health outcomes are due to some unobserved differences that we cannot explore due to data limitations. These factors could include early parenting behaviours that improve a child's immune system or their overall ability to cope with health risks in their environment, on a long-term basis.

5.2 Heterogeneities

Because paid parental leave rights affect the probability of having multiple conditions, but do not greatly reduce the risk of having at least any one condition, we hypothesise the effect of paid parental leave rights to vary across the health distribution and to be stronger at its lower end. Given the literature documenting the child health-income gradient (Kuehnle, 2014), we expect heterogeneous effects of paid parental leave rights by parental socio-economic background. Moreover, paid parental leave rights can be seen as an increase in family wealth, or a relaxation of a family's budget constraint, either in terms of time or money. We hypothesise that the impact of an increase in wealth will be relatively greater for families with low overall wealth.

We estimate the effect of paid parental leave rights on the probability of suffering multiple health conditions by various measures of parental background: first, we estimate the effect separately for children whose mother's income in her last jobs before birth was below or above mother's median income, followed by two estimations for children with fathers (parents) whose income (combined income) is below or above the median;[17] second, we divide children into those whose mothers (and fathers, respectively) do have a tertiary qualification versus those whose mothers/fathers do not. Splitting the sample of course leads to reduced sample sizes and

in explaining the impact of paid parental leave on children's health, but also in explaining children's health itself. The coefficients representing the proposed transmission mechanism are jointly significant at the 10-% level in 23 of the 71 regressions reported in Table 5. We find significant coefficients for indicators of child care utilisation and parental health, but not for breastfeeding. Significant effects mostly occur in the first three waves for health outcomes related to hearing or breathing, or having any health problem at the time of the survey. We find a significant impact of child care utilisation on hearing and breathing problems in all waves.

[17]The median in all three cases is conditional on being a mother, father or parent couple.

increased standard errors, making it somewhat difficult to detect significant effects.[18] However, a systematic pattern emerges nonetheless.

Table 6 presents the results based on the preferred estimator - the OLS estimations with the full set of controls (specification 3). The advantageous effect of paid parental leave rights by parental background follows the same pattern along children's age as for the full sample. However, the effect is generally stronger for children whose parents do not have a tertiary degree, and weaker for children with higher parental education.[19] We also find stronger effects on average for children of low-income fathers or from low-income families. Thus, our evidence suggests that the advantageous effect of paid parental leave rights occurs predominantly among children with lower parental socio-economic background - a group that has a substantially *lower* chance of having access to paid parental leave coverage. In a situation where employer-provided leave, determined by individuals' bargaining power in wage negotiations, is usually granted to groups that benefit the least, a case can be made for government-provided leave, either in a universal paid parental leave rights scheme, or in a scheme targeted at parents from a less advantaged background.

The results show similar patterns as for the full sample when exploring transmission mechanisms for the subgroup of children with at least one parent without tertiary education in columns 2 to 5 of Table A.2.

6 Conclusion

This paper examines the effect of paid parental leave rights, conditional on access to unpaid parental leave, on children's health. Previous evidence on paid parental leave rights' effects on children's health is scarce and mostly based on aggregated macro-data, which makes it difficult to control for confounding factors in the absence of randomised control trials. Our analysis

[18]Estimating separately by mothers or fathers income based on median salary of course divides the sample in about two equally sized groups each; dividing the children in two groups along mothers' tertiary qualifications also creates two groups of nearly equal size. About a third of all children in the sample have a father with a tertiary education and two thirds have a father without one (compare Table 2).

[19]Column 1 in Table A.2 contains the full set of estimation results, using a sample restricted to children whose father or mother do not have a tertiary qualification, analogous to column 3 of Table 4.

uses an extremely rich micro-data set, which allows us to control for a very broad range of confounding factors, to estimate the effect of paid parental leave rights.

Our analysis shows that paid parental leave rights strongly reduce the probability of children having multiple health problems, with the effect varying from a minimum of just under 2pp at age 2-3 to a maximum of around 5pp at age 4-5. This implies that the effect is greater and thus of particular importance for children at the lower end of the health distribution. Moreover, the effect is stronger for children from lower socio-economic background, measured in terms of parental education and income, which again implies that less advantaged children have greater health improvements if their parents are granted paid parental leave rights.

These heterogeneities strongly suggest that mandatory, government-funded paid parental leave rights have an important advantage over voluntary, employer-funded paid parental leave rights. Typically, voluntarily provided leave is more likely to be granted to high-educated parents and parents on high incomes who have greater bargaining power in negotiating their salary packages. Highly educated parents who have high incomes also typically have healthier children. It is precisely the children of parents of lower socio-economic status who are typically in worse health, and who would benefit the most from having parents with access to paid parental leave, but those parents are unlikely to be covered by voluntary schemes. In such a situation, a mandatory government-funded parental leave scheme can have a much greater average impact per child than a voluntary employer-provided scheme.

The longitudinal nature of the data allows us to follow children over time, up to age 6-7, and the advantageous health effects of paid parental leave rights last into the children's first years of school. The health effect from paid parental leave therefore lasts at least several years after its direct effect on the mother's presence at home has faded. The advantageous health effects were measured for relatively short durations of paid parental leave: overall, mothers in Australia who have any leave at all, only have access to about 9 weeks on average, which is a relatively short time of financial investment. At the same time, this research shows that this short period of investment is linked to a long period of public health returns which further support the desirability of a government-funded paid parental leave scheme. However, future research needs to explore in more detail which transmission mechanisms account for the positive effect of parental leave rights on child health.

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Table 1: Descriptive statistics: incidence of child health problems (in %) by mother's eligibility status.

	Wave 1			Wave 2			Wave 3			Wave 4		
	not eligible	eligible	p-value	not eligible	eligible	p-value	not eligible	eligible	p-value	not eligible	eligible	p-value
Ongoing health problem	27.01	27.32	.884	31.55	29.88	.443	35.7	32.95	.226	43.31	40.8	.292
>1 health problem	6.4	4.34	.048	8.04	5.73	.052	12.19	8.26	.006	16.67	12.47	.013
Had an injury	5.92	5.92	.995	21.44	18.01	.067	14.3	13.43	.596	13.38	12.9	.765
Vision problems	1.66	1.38	.624				4.23	2.07	.008	8.46	6.55	.131
Ear infections	3.44	2.47	.215	6.09	3.62	.014	5.97	4.03	.06	5.93	4.12	.083
Hearing problems	.24	.39	.552				2.11	1.55	.374	2.9	2.22	.366
Food or digestive allergies	5.57	5.13	.674	9.87	8.95	.507	7.46	8.16	.586			
Had wheezing/whistling	15.05	12.13	.067	25.21	20.22	.011	19.03	15.91	.084	17.42	15.12	.193
Diagnosed bronchiolitis	11.61	9.76	.198									
Recurrent abdominal pain				.85	1.41	.271	1.62	1.55	.91	3.03	4.55	.102
Diagnosed asthma				13.64	9.96	.015	20.77	16.74	.03	24.49	23.89	.769
Frequent headaches							.62	.62	.996	3.03	1.69	.064
Attention deficit disorder							.5	.1	.119	1.26	1.37	.839
Recurrent other bodily pain										2.15	1.59	.387
Bone, joint/muscle problem										3.28	2.33	.225
Anxiety disorder, depression										2.15	1.69	.489
Epilepsy or seizure disorder										.25	.63	.242
N	844	1014		821	994		804	968		792	946	

Source: Longitudinal study of Australian children (LSAC).

Note: The grey cells represent the waves for which the difference in a specific child health outcome for eligible and non-eligible mothers is significant at the 10%-level.

Table 2: Descriptives characteristics

	not eligible	eligible	p-value
Child characteristics			
Age at birth youngest quartile	19.53	14.97	.000
Age at birth second quartile	29.41	25.65	.000
Age at birth third quartile	28	31.06	.005
Age at birth oldest quartile	23.06	28.33	.000
Siblings at birth: None	58.11	54.46	.002
Siblings at birth: One	30.6	33.99	.002
Siblings at birth: Two or more	11.28	11.55	.725
Mother's characteristics			
No trade certificate, Year 12 not finished	9.57	6.71	.000
No trade certificate, Year 12 finished	16.25	10.96	.000
Trade certificate, Year 12 not finished	12.24	6.94	.000
Trade certificate, Year 12 finished	17.02	9.28	.000
Advanced diploma/ diploma	10.86	9.46	.051
Bachelor degree	19.96	33.2	.000
Graduate diploma/ certificate	6.65	9.1	.000
Post-graduate degree	7.45	14.35	.000
Australian born	84.36	86.92	.002
Indigenous	.98	.71	.215
Mother in a long-term relationship	89.76	92.35	.000
Remoteness: Highly accessible	54.86	57.16	.05
Remoteness: Accessible	24.87	21.7	.002
Remoteness: Moderately accessible, remote or very remote	20.27	21.14	.367
Father's characteristics			
There is no father/ no relationship with child's father	6.01	4.26	.001
Child's father is mother's husband	76.76	82.18	.000
Child's father is mother's de facto partner	17.23	13.56	.000
Age at birth (Father) youngest quartile	19.87	14.64	.000
Age at birth (Father) second quartile	28.49	29.83	.213
Age at birth (Father) third quartile	29.75	29.58	.876
Age at birth (Father) oldest quartile	21.9	25.96	.000
Education (Father) No trade certificate, Year 12 not finished	18.4	12.6	.000
Education (Father) No trade certificate, Year 12 finished	11.71	9.71	.006
Education (Father) Trade certificate, Year 12 not finished	22.57	17.9	.000
Education (Father) Trade certificate, Year 12 finished	13.95	12.32	.040
Education (Father) Advanced diploma/ diploma	7.64	9.33	.011
Education (Father) Bachelor degree	14.44	21.11	.000
Education (Father) Graduate diploma/ certificate	5.18	7.5	.000
Education (Father) Post-graduate degree	6.1	9.54	.000
Salary per week (Father)	922.62	1054.31	.000
Salary per week missing (Father)	2.58	2.22	.322

Continued on next page

Table 2 – continued from previous page

	not eligible	eligible	p-value
Pregnancy and birth			
Alcohol during first trimester: Never	69.33	71.39	.057
Alcohol during first trimester: Less than once a week	23.03	20.17	.003
Alcohol during first trimester: At least once a week	7.64	8.44	.213
Alcohol during 2nd trimester: Never	60.75	59.84	.435
Alcohol during 2nd trimester: Less than once a week	28.37	26.57	.089
Alcohol during 2nd trimester: At least once a week	10.89	13.59	.001
Alcohol during 3rd trimester: Never	60.29	55.99	.000
Alcohol during 3rd trimester: Less than once a week	29.22	29.14	.940
Alcohol during 3rd trimester: At least once a week	10.49	14.86	.000
Cigarettes during first trimester: Never	87.67	90.59	.000
Cigarettes during first trimester: Less than once a week	1.44	1.22	.422
Cigarettes during first trimester: At least once a week	10.89	8.18	.000
Cigarettes during 2nd trimester: Never	89.45	91.69	.001
Cigarettes during 2nd trimester: Less than once a week	1.32	1.12	.448
Cigarettes during 2nd trimester: At least once a week	9.23	7.19	.002
Cigarettes during 3rd trimester: Never	89.73	91.76	.003
Cigarettes during 3rd trimester: Less than once a week	1.53	1.43	.712
Cigarettes during 3rd trimester: At least once a week	8.74	6.81	.002
Diabetes	5.18	4.56	.224
High blood pressure requiring treatment	9.41	6.2	.000
Stress, anxiety or depression	16.1	14.66	.092
Mother took prescribed medicine during pregnancy	27.66	28.66	.349
>=10 medical visits/check-ups during pregnancy	72.09	71.11	.358
Weeks of gestation	39.19	39.21	.605
Birth on time	89.7	88.99	.332
Birth type: Natural	58.51	57.29	.298
Birth type: Cesarean	31.19	31.16	.979
Birth type: Other	10.3	11.55	.093
Mother's pre-birth employment characteristics			
Salary per week	624.87	821.05	.000
Hours per week: <10 hours/week	4.78	4.28	.309
Hours per week: 10-19 hours/week	14.32	11.78	.001
Hours per week: 20-29 hours/week	16.68	17.72	.246
Hours per week: 30-39 hours/week	37.07	35.85	.283
Hours per week: 40-49 hours/week	23.34	24.55	.229
Hours per week: >=50 hours/week	3.8	5.81	.000
Size of employer: <=5 employees	9.38	5.28	.000
Size of employer: 5-19 employees	24.04	11.19	.000
Size of employer: 20-99 employees	22.02	15.96	.000
Size of employer: 100-499 employees	14.78	14.97	.825
Size of employer: >=500 employees	29.78	52.6	.000

Continued on next page

Table 2 – continued from previous page

	not eligible	eligible	p-value
Union member	20.06	44.01	.000
Public Sector	16.25	54.92	.000
N	844	1014	

Source: Longitudinal study of Australian children (LSAC), own calculations

Table 3: Characteristics after Matching

	not eligible	eligible	p-value
Child characteristics			
Age at birth youngest quartile	17.35	15.38	.27
Age at birth second quartile	26.97	26.06	.67
Age at birth third quartile	31.39	30.99	.86
Age at birth oldest quartile	24.29	27.58	.12
Siblings at birth: None	52.73	53.76	.67
Siblings at birth: One	35.31	34.27	.65
Siblings at birth: Two or more	11.96	11.97	.99
Mother's characteristics			
No trade certificate, Year 12 not finished	7.14	7.16	.99
No trade certificate, Year 12 finished	10.44	11.85	.35
Trade certificate, Year 12 not finished	7.93	7.28	.61
Trade certificate, Year 12 finished	9.77	9.86	.95
Advanced diploma/ diploma	8.84	10.09	.38
Bachelor degree	34.65	30.87	.10
Graduate diploma/ certificate	8.52	9.15	.65
Post-graduate degree	12.7	13.73	.53
Australian born	88.46	86.85	.32
Indigenous	1.05	.7	.45
Mother in a long-term relationship	90.52	92.72	.10
Remoteness: Highly accessible	54.21	55.52	.59
Remoteness: Accessible	20.75	23	.26
Remoteness: Moderately accessible, remote or very remote	25.04	21.48	.08
There is no father/ no relationship with child's father	5	3.99	.32
Child's father is mother's husband	78.58	82.28	.05
Child's father is mother's de facto partner	16.42	13.73	.12
Father's characteristics			
Age at birth (Father) youngest quartile	17.54	14.55	.09
Age at birth (Father) second quartile	29.16	29.93	.73
Age at birth (Father) third quartile	30.98	30.28	.75
Age at birth (Father) oldest quartile	22.32	25.23	.16
Education (Father) No trade certificate, Year 12 not finished	13.86	12.91	.56
Education (Father) No trade certificate, Year 12 finished	8.37	10.09	.22
Education (Father) Trade certificate, Year 12 not finished	20.76	19.25	.43
Education (Father) Trade certificate, Year 12 finished	12.62	13.15	.75
Education (Father) Advanced diploma/ diploma	9.41	8.92	.72
Education (Father) Bachelor degree	19.84	19.84	1.00
Education (Father) Graduate diploma/ certificate	6.59	6.57	.99
Education (Father) Post-graduate degree	8.54	9.27	.60
Salary per week (Father)	1020.696	1032.242	.68
Salary per week missing (Father)	1.97	2.11	.83

Continued on next page

Table 3 – continued from previous page

	not eligible	eligible	p-value
Pregnancy and birth			
Alcohol during first trimester: Never	72.15	71.24	.68
Alcohol during first trimester: Less than once a week	19.83	20.66	.67
Alcohol during first trimester: At least once a week	8.02	8.10	.95
Alcohol during 2nd trimester: Never	59.95	60.33	.87
Alcohol during 2nd trimester: Less than once a week	26.29	26.64	.87
Alcohol during 2nd trimester: At least once a week	13.76	13.03	.66
Alcohol during 3rd trimester: Never	57.96	56.92	.67
Alcohol during 3rd trimester: Less than once a week	28.02	28.99	.66
Alcohol during 3rd trimester: At least once a week	14.02	14.08	.97
Cigarettes during first trimester: Never	90.18	90.61	.76
Cigarettes during first trimester: Less than once a week	.93	1.29	.47
Cigarettes during first trimester: At least once a week	8.90	8.10	.55
Cigarettes during 2nd trimester: Never	91.24	91.78	.68
Cigarettes during 2nd trimester: Less than once a week	1.57	1.17	.48
Cigarettes during 2nd trimester: At least once a week	7.19	7.04	.90
Cigarettes during 3rd trimester: Never	91.28	92.02	.58
Cigarettes during 3rd trimester: Less than once a week	1.80	1.41	.52
Cigarettes during 3rd trimester: At least once a week	6.91	6.57	.78
Diabetes	3.45	4.46	.28
High blood pressure requiring treatment	6.56	6.69	.91
Stress, anxiety or depression	15.69	15.14	.75
Mother took prescribed medicine during pregnancy	24.24	27.93	.08
>=10 medical visits/check-ups during pregnancy	70.13	70.54	.85
Weeks of gestation	39.264	39.187	.40
Birth on time	89.49	88.97	.73
Birth type: Natural	60.99	57.51	.14
Birth type: Cesarean	29.53	31.46	.39
Birth type: Other	9.48	11.03	.29
Mother's pre-birth employment characteristics			
Salary per week	743.238	778.462	.13
Hours per week: <10 hours/week	4.89	4.23	.51
Hours per week: 10-19 hours/week	14.99	12.79	.19
Hours per week: 20-29 hours/week	19.91	17.72	.25
Hours per week: 30-39 hours/week	32.41	35.68	.15
Hours per week: 40-49 hours/week	21.55	24.41	.16
Hours per week: >=50 hours/week	6.25	5.16	.33
Size of employer: <=5 employees	7.81	5.75	.09
Size of employer: 5-19 employees	12.85	12.32	.74
Size of employer: 20-99 employees	15.59	16.78	.50
Size of employer: 100-499 employees	14.71	15.85	.51
Size of employer: >=500 employees	49.04	49.30	.92

Continued on next page

Table 3 – continued from previous page

	not eligible	eligible	p-value
Union member	39.25	39.32	.98
Public Sector	49.59	50.94	.58
N	844	1014	

Source: Longitudinal study of Australian children (LSAC), own calculations

Table 4: Effect of leave eligibility on child health

	OLS (1)	OLS (2)	OLS (3)	Matching (1)	Matching (2)	Matching (3)
Panel A: Children aged 0-1; N=1,987						
Ongoing health problem (0/1)	-0.009	-0.008	-0.018	-0.009	-0.006	-0.016
	(0.021)	(0.021)	(0.022)	(0.022)	(0.023)	(0.028)
>1 health problem (0/1)	-0.027***	-0.027***	-0.030***	-0.027**	-0.025**	-0.034**
	(0.010)	(0.010)	(0.011)	(0.012)	(0.012)	(0.015)
Vision problems	-0.001	-0.001	-0.002	0.001	0.001	-0.002
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.008)
Hearing problems/ear infections	-0.009	-0.008	-0.012	-0.010	-0.008	-0.011
	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.011)
Wheezing/whistling in chest	-0.023	-0.019	-0.025	-0.007	-0.002	-0.008
	(0.016)	(0.016)	(0.017)	(0.018)	(0.018)	(0.022)
Panel B: Children aged 2-3; N=1,937						
Ongoing health problem (0/1)	-0.025	-0.023	-0.030	-0.022	-0.020	-0.006
	(0.022)	(0.022)	(0.024)	(0.024)	(0.024)	(0.030)
>1 health problem (0/1)	-0.014	-0.014	-0.019	-0.014	-0.015	-0.012
	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)	(0.016)
Hearing problems/ear infections	-0.016	-0.016	-0.018*	-0.016	-0.016	-0.006
	(0.010)	(0.010)	(0.011)	(0.011)	(0.012)	(0.014)
Diagnosed asthma	-0.028*	-0.027*	-0.027*	-0.028*	-0.024	-0.013
	(0.015)	(0.015)	(0.016)	(0.017)	(0.017)	(0.021)
Panel C: Children aged 4-5; N=1,890						
Ongoing health problem (0/1)	-0.033	-0.030	-0.043*	-0.041	-0.033	-0.057*
	(0.023)	(0.023)	(0.025)	(0.025)	(0.025)	(0.031)
>1 health problem (0/1)	-0.050***	-0.050***	-0.051***	-0.051***	-0.047***	-0.068***
	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)	(0.020)
Vision problems	-0.022**	-0.021**	-0.021**	-0.026***	-0.020**	-0.017
	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.013)
Hearing problems/ear infections	-0.019*	-0.017	-0.019*	-0.015	-0.015	-0.019
	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.015)
Diagnosed asthma	-0.028	-0.025	-0.022	-0.033	-0.024	-0.016
	(0.019)	(0.019)	(0.020)	(0.021)	(0.021)	(0.026)
Panel D: Children aged 6-7; N=1,850						
Ongoing health problem (0/1)	-0.026	-0.028	-0.041	-0.030	-0.028	-0.015
	(0.024)	(0.024)	(0.026)	(0.026)	(0.026)	(0.032)
>1 health problem (0/1)	-0.043**	-0.043**	-0.043**	-0.037*	-0.036*	-0.047**
	(0.017)	(0.017)	(0.019)	(0.019)	(0.019)	(0.024)
Vision problems	-0.025*	-0.025*	-0.026*	-0.028**	-0.026*	-0.014
	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.018)
Hearing problems/ear infections	-0.012	-0.012	-0.008	-0.008	-0.010	-0.002
	(0.013)	(0.013)	(0.014)	(0.014)	(0.015)	(0.018)
Diagnosed asthma	0.006	0.008	0.018	0.003	0.010	0.018
	(0.021)	(0.021)	(0.023)	(0.023)	(0.023)	(0.028)
Demographic controls	✔	✔	✔	✔	✔	✔
Health behaviour during pregnancy		✔	✔		✔	✔
Employer characteristics			✔			✔

Source: Longitudinal study of Australian children (LSAC).

*Notes: Each coefficient is obtained from a separate regression. Matching estimator based on kernel-based matching algorithm. Variables included in each specification are listed in Table 2. Cluster-robust standard errors in parentheses . *** p<0.01, ** p<0.05, * p<0.1.*

Table 5: Effect of leave eligibility on child health with transmission mechanisms - all

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)
Panel A: Children aged 0-1; N=1,858					
Ongoing health problem	-0.006	-0.005	-0.003	-0.000	0.003
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
>1 health problem	-0.026**	-0.025**	-0.026**	-0.024**	-0.024**
	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)
Vision problems	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.007)	(0.007)	(0.007)	(0.006)	(0.007)
Hearing problems/ear infections	-0.007	-0.007	-0.008	-0.007	-0.007
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Wheezing/whistling in chest	-0.027	-0.025	-0.028	-0.024	-0.025
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Panel B: Children aged 2-3; N=1,815					
Ongoing health problem	-0.027	-0.027	-0.029	-0.026	-0.027
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
>1 health problem	-0.021*	-0.021*	-0.021*	-0.020	-0.020
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Hearing problems/ear infections	-0.024**	-0.023**	-0.024**	-0.022*	-0.021*
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Diagnosed asthma	-0.024	-0.022	-0.024	-0.020	-0.019
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Panel C: Children aged 4-5; N=1,772					
Ongoing health problem	-0.036	-0.035	-0.038	-0.036	-0.038
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
>1 health problem	-0.044***	-0.044***	-0.046***	-0.044***	-0.046***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Vision problems	-0.015	-0.014	-0.015	-0.015	-0.015
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Hearing problems/ear infections	-0.017	-0.016	-0.018	-0.016	-0.017
	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)
Diagnosed asthma	-0.019	-0.017	-0.023	-0.013	-0.015
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Panel D: Children aged 6-7; N=1,738					
Ongoing health problem	-0.023	-0.020	-0.022		-0.020
	(0.027)	(0.027)	(0.027)		(0.027)
>1 health problem	-0.030	-0.030	-0.027		-0.027
	(0.020)	(0.020)	(0.020)		(0.020)
Vision problems	-0.021	-0.020	-0.019		-0.018
	(0.015)	(0.015)	(0.015)		(0.015)
Hearing problems/ear infections	-0.003	-0.003	-0.002		-0.002
	(0.015)	(0.015)	(0.015)		(0.015)
Diagnosed asthma	0.028	0.031	0.027		0.030
	(0.023)	(0.023)	(0.023)		(0.023)
Specification with 3 sets of controls	✔	✔	✔	✔	✔
Breastfeeding		✔			✔
Parental health			✔		✔
Child care				✔	✔

Source: Longitudinal study of Australian children (LSAC), own calculations

*Notes: Each coefficient is obtained from a separate regression. Variables included in each specification are listed in Table 2. The indicators for transmission mechanisms are jointly significant at the 10%-level for 23 out of 71 regressions. Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.*

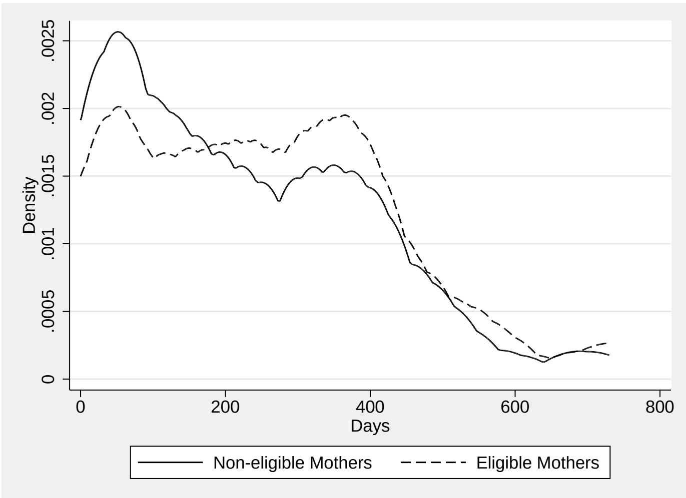
Table 6: Effect of leave eligibility on child health, by parental socio-economic status

	Wave 1	Wave 2	Wave 3	Wave 4
Mother high income	-0.021	-0.026	-0.046*	-0.024
	(0.019)	(0.021)	(0.027)	(0.034)
N	834	819	802	790
Mother low income	-0.028*	-0.022	-0.048**	-0.028
	(0.015)	(0.018)	(0.022)	(0.026)
N	1021	994	968	946
Father high income	-0.027*	-0.022	-0.026	-0.018
	(0.017)	(0.019)	(0.026)	(0.030)
N	806	783	774	758
Father low income	-0.021	-0.012	-0.067***	-0.036
	(0.016)	(0.020)	(0.024)	(0.030)
N	905	888	867	852
Family high income	-0.029	-0.029	-0.038	-0.018
	(0.018)	(0.021)	(0.029)	(0.033)
N	783	762	752	740
Family low income	-0.025	-0.016	-0.065***	-0.039
	(0.016)	(0.019)	(0.023)	(0.027)
N	927	908	888	869
Mother tertiary education	-0.008	-0.021	-0.053*	-0.035
	(0.019)	(0.019)	(0.028)	(0.032)
N	862	837	822	812
Mother no tertiary education	-0.042***	-0.019	-0.038*	-0.032
	(0.014)	(0.018)	(0.021)	(0.027)
N	996	978	950	926
Father tertiary education	0.001	-0.006	-0.016	-0.053
	(0.022)	(0.026)	(0.034)	(0.037)
N	606	584	578	567
Father no tertiary education	-0.036***	-0.023	-0.066***	-0.025
	(0.014)	(0.016)	(0.021)	(0.026)
N	1156	1136	1107	1086

Source: Longitudinal study of Australian children (LSAC).

*Notes: Dependent variable: if child has multiple health problems (0/1). Each coefficient is obtained from a separate linear probability model controlling for all variables contained in specification 3 (see Table 2 for descriptives). Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.*

Figure 1: Breastfeeding duration by eligibility for paid parental leave - kernel density



APPENDIX

Table A.1: Descriptive statistics for breastfeeding by eligibility status

	not eligible	eligible	p-value
Breastfed more than 2 weeks	85.890	88.880	0.001
Breastfed more than 4 weeks	81.450	85.580	0.000
Breastfed more than 13 weeks	62.410	70.800	0.000
Breastfed more than 26 weeks	45.200	53.600	0.000
Breastfed more than 39 weeks	33.590	38.880	0.000
Breastfed more than 52 weeks	18.780	23.260	0.000
N	844	1014	

Source: Longitudinal study of Australian children (LSAC), own calculations

Table A.2: Effect of leave eligibility on child health with transmission mechanisms - only parents with no tertiary qualification

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)
Panel A: Children aged 0-1; N=1,396					
Ongoing health problem	-0.004	-0.004	-0.004	0.002	0.003
	(0.026)	(0.026)	(0.026)	(0.026)	(0.027)
>1 health problem	-0.033**	-0.033**	-0.034***	-0.030**	-0.031**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Vision problems	0.000	0.000	0.000	-0.000	0.000
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Hearing problems/ear infections	-0.010	-0.010	-0.012	-0.010	-0.012
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Wheezing	-0.032	-0.030	-0.035*	-0.028	-0.029
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Panel B: Children aged 2-3; N=1,369					
Ongoing health problem	-0.037	-0.036	-0.037	-0.037	-0.035
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
>1 health problem	-0.030**	-0.030**	-0.030**	-0.029*	-0.029**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Hearing problems/ear infections	-0.027**	-0.027**	-0.027**	-0.025*	-0.025*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Diagnosed asthma	-0.017	-0.015	-0.017	-0.013	-0.013
	(0.019)	(0.019)	(0.020)	(0.019)	(0.019)
Panel C: Children aged 4-5; N=1,335					
Ongoing health problem	-0.022	-0.022	-0.026	-0.021	-0.025
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
>1 health problem	-0.051***	-0.051***	-0.055***	-0.049***	-0.052***
	(0.019)	(0.019)	(0.018)	(0.019)	(0.019)
Vision problems	-0.010	-0.010	-0.010	-0.011	-0.010
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Hearing problems/ear infections	-0.009	-0.010	-0.012	-0.008	-0.011
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Diagnosed asthma	-0.010	-0.009	-0.014	-0.002	-0.006
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Panel D: Children aged 6-7; N=1,305					
Ongoing health problem	-0.028	-0.027	-0.029		-0.028
	(0.031)	(0.031)	(0.031)		(0.031)
>1 health problem	-0.032	-0.032	-0.030		-0.030
	(0.023)	(0.023)	(0.023)		(0.023)
Vision problems	-0.024	-0.023	-0.022		-0.021
	(0.017)	(0.017)	(0.017)		(0.017)
Hearing problems/ear infections	-0.004	-0.004	-0.003		-0.004
	(0.017)	(0.017)	(0.017)		(0.017)
Diagnosed asthma	0.052*	0.054**	0.051*		0.052*
	(0.027)	(0.027)	(0.028)		(0.027)
Specification with 3 sets of controls	✔	✔	✔	✔	✔
Breastfeeding		✔			✔
Parental health			✔		✔
Child care				✔	✔

Source: Longitudinal study of Australian children (LSAC).

*Notes: Each coefficient is obtained from a separate regression. Variables included in each specification are listed in Table 2. Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.*