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PIER Working Paper
23-020

Minimum Wages and Intergenerational Health

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December 12, 2023

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Abstract

Most minimum wage (MW) research focuses on wage and employment impacts in high-income countries. Little is known about broader impacts, including on parental and child health in low- and middle- income countries (LMICs) where most people affected by MWs live. This study studies MW effects on employment, earnings, parental health and child health in Indonesia, the third most-populous LMIC. Results include: MWs improve men's earnings, parental hemoglobin, and child height-for-age and reduce pregnancy complications. This study highlights nuanced but positive roles MWs may play in improving parental and child health, despite not directly affecting women's earnings and labor supplies.

Keywords: Minimum Wage, Intergenerational Health, Indonesia

JEL: I14, I15, I18, J13, J38, J8, O1

[*]Population Studies Center, University of Pennsylvania. Majid acknowledges funding from the National Institutes of Health (NIH) grant award R03HD097425. NIH funded Majid as Principal investigator (PI) and provided partial support to other team members as well.

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1 Introduction

Minimum wage (MW) legislation is now almost universal. Initially instituted in high-income countries (HICs), it has spread extensively in most low- and middle-income countries (LMICs)-wherein the majority of the world's poor and the majority of people affected by MWs reside. By now, more than 80% of low- and middle-income countries (LMICs) have introduced MWs with real levels being adjusted continuously. Even though nearly three decades have passed since the advent of the "new MW research" (see, e.g., Card and Krueger (2016); Neumark and Wascher (2008)), relatively few studies have examined the effects of MWs in LMICs. Moreover, there is little research on the broader MW effects on the health of parents and children, such as nutrition and birth outcomes.

This paper broadens the scope of existing knowledge by studying the effects of MWs on intergenerational health in Indonesia. Theoretically, the impact is ambiguous as MWs may increase or decrease labor supply and earnings. On one hand, if MW increases lead to higher incomes, this may encourage greater monetary investment in individual health and increase parental investment in children. This may occur if, for instance, firms raise workers' wages to comply with the new law. However, parents may increase their work hours in response to higher wages, which could have negative consequences on their own health and their children's well-being due to increased work-related stress and reduced time-availability for care-giving activities. On the other hand, if firms decrease the size of their workforce in response to higher labor costs, some individuals might become unemployed in MW-covered sectors. This may reduce monetary child investments but increase time investments.

We hypothesize that in LMICs MW hikes are more likely to affect men's earnings and employment than women's earnings in the presence of children as many mothers refrain from working due to cultural reasons or family duties(Kim and Williams, 2021). Given the importance of the fetal and early life environments (Almond and Currie, 2011; Majid and Behrman, 2021), we also expect that changes in MWs in the year of birth can have long-lasting, though ambiguous, impacts on pre-school children and later-life health, through direct effects on resources and time invested and indirect effects through changes in parental health. We study a) the effects of MWs on health (as measured by bio-metric data on anemia) of parents/adult married men and women (18-55 years of age); b) the effects of MWs on pregnancy complications; c) the effects of MW in one's year of birth on child development/quality (e.g. child height) up to seven years after birth; and d) the effects of MWs on household investments in nutritious (protein-rich) foods.

For our empirical analysis, we use the Indonesian Family Life Survey (IFLS), which is a rich nationally representative longitudinal data set. It contains detailed information on economic and health conditions of all members in a given household spanning over 20 years and five waves (1993, 1997, 2000, 2007, 2014). In particular, 'gold standard' bio-marker and anthropomorphic data is available, strengthening our adult and child health analysis. We merge this data with a yearly province-level panel of MW levels as well as other macroeconomic variables constructed from the Indonesian Bureau of Statistics.

We adopt multiple empirical approaches, utilizing the longitudinal nature of our data. First, we estimate individual/biological mother fixed-effects models. Second, we link each observation to the ratio of lagged earnings of the male household head to MWs in the previous period. This approach allows us to study more carefully the subgroup whose household heads' previous earnings were just above or below the MW level. We expect this group to benefit the most from MW increases. This is in similar spirit to recent work on the distributional effects of MWs in the US (Cengiz et al., 2019). We conduct robustness tests based on time-varying controls and alternative thresholds to define the low-wage treatment and high-wage control groups

For adult and household-level outcomes, we study the effects of contemporaneous MWs, e.g. how do MWs affect earnings, adult health, and food expenses in the same year. For child outcomes, we focus on MWs in the years of birth. We exploit the timing of births of siblings: some siblings are born in years with higher MWs whereas others are born in years with lower MWs. Comparisons of children born to the same biological mother help address unobserved time-invariant factors common across siblings that could generate omitted-variable bias.

In our adult analyses, we find that MWs improve earnings of men but not of women, and particularly for those men in the bottom part of (lagged) wage distributions. We find no evidence of substitution effects in terms of hours worked or employment for men or women. Thus MWs lead to a pure income effect for men/fathers/husbands, with no income effect for women. In terms of parental health, we find MWs to be effective in improving hemoglobin (lowering risk of anemia). In our inter-generational and child-health analyses, the estimated effect of MWs on pregnancy complications and on height-for-age z scores (HAZ) (up to seven years after birth) suggests MWs significantly improve child health and nutrition in Indonesia with no evidence of fadeout over the first seven years of life and with possible implications over the life course

(Hoddinott et al. (2013). Moreover, the inter-generational effects are generally strongest and most precisely estimated for children whose fathers earn low wages. Investigating one possibly important mechanism for improvement in parental and child health due to MWs, we find that household expenses on protein-rich foods increase.

This paper brings together two large literatures: 1) the MW literature, which primarily examines effects on employment and earnings but in some cases other outcomes such as health, primarily in HICs (Neumark, 2023; Neumark and Shirley, 2022; Cengiz et al., 2019; Dube, 2019a,b; Belman and Wolfson, 2014); 2) the literature studying socioeconomic status (SES)-health gradients and effects of early life income shocks on health and skill accumulation over the life course in developing countries (Majid and Behrman, 2021; Currie and Vogl, 2013; Cutler et al., 2011; Maccini and Yang, 2009). Our paper is the first to study comprehensively the parental and child-health effects of MWs in conjunction with wage and employment effects in LMICs. Not much is understood in LMICs or HICs for that matter about the roles fathers play in early life development (Rossin-Slater, 2017) and in particular how MWs affect parental health and investments in child health (Wehby et al., 2020). Our study fills these gaps and highlights the nuanced but positive role MWs may play in improving investments in human capital, probably through fathers' earnings due to pure income effects.

Indonesia is a an ideal setting to study MWs. As the third most-populous LMIC and the fourth most-populous country on the planet, Indonesia hosts a significant number of people whose lives are affected by MWs. MWs are an integral part of the social policy debate in Indonesia with regular worker protests for higher wages. Each province sets its own MWs, allowing for significant cross-provincial variation in MWs. Universal legal coverage of MWs applies to workers in both formal and informal sectors (Magruder, 2013; Rani et al., 2013). Real MWs have more than doubled in 20 years. Indonesia battles with high poverty rates and disease burdens among adults/parents and children alike: a third of children are stunted, the fifth highest in the world.[1] Anemia is a major health concern, with a prevalence of 22.7% in women of childbearing age, 37.1% among pregnant women and 30.0% to 46.6% among female workers.[2]

2 Literature Review

Theoretical and empirical results from the large literature on MWs are diverse. Numerous papers find that MWs can increase the earnings of low-income workers without causing job losses as wage increases improve workers' productivity, particularly for workers in large firms (Card and Krueger, 2016; Chun and Khor, 2010; Dube, 2019a; Dube et al., 2010; MaCurdy, 2015). However, other studies have also suggested that higher MWs can lead to lower employment (especially for workers in smaller firms) as costs of production increase and firms respond by laying-off workers (Belman and Wolfson, 2014; Belman et al., 2015; Neumark and Wascher, 2008). In the context of LMICs, the relatively limited but growing literature generally finds heterogeneous effects of

[1] https://www.unicef.org/indonesia/nutrition.

[2] Globally, roughly a third of the world's population (Chaparro and Suchdev, 2019) are affected by anemia, with iron-deficiency anemia being the leading cause. Anemia and iron deficiency can cause fatigue, impair cognition and lower work capacity, and lead to an estimated average 6-percent loss in GDP per capita (Horton and Ross, 2003). To address the high burden of anemia, the World Health Assembly set the target of reducing anemia by half among women of reproductive age by 2025 relative to 2010 levels. Moreover, the United Nations Sustainable Development Goals (SDGs) also aim to reduce different forms of malnutrition, and name anemia as a particular focus.

MW policies on employment and poverty (Betcherman, 2012). Studies from middle-income contexts (Latin America) suggest that higher MWs can lead to increases in wages for workers with earnings close to the MW level (Campos-Vazquez and Esquivel, 2021; Bhorat, 2014). Other work in low-income contexts (Sub-Saharan Africa) find that increases in MWs have small negative impacts, or no measurable impacts on employment (Bhorat et al., 2017).

There are a handful of papers that study MWs in Indonesia that focus exclusively on employment and earnings effects of MWs (Del Carpio et al., 2012; Magruder, 2013; Chun and Khor, 2010; Hohberg and Lay, 2015; Rama, 2001; Broecke et al., 2017). Chun and Khor (2010) suggest that an increase in MWs may cause companies to demand less labor, thus reducing employment. However, Alatas and Cameron (2008) argue that firm size matters: small domestic firms may register unemployment effects but there are no negative employment effects for medium- and large-sized firms. Instead of focusing on firms' sizes, Magruder (2013) addresses the impact of MWs in different business sectors, in particular formal and informal. His results show that higher MWs induce workers away from informal to formal jobs, leading to decreases (increases) in employment in the informal (formal) as higher wages lead to greater demand for formal products. Using the IFLS, Hohberg and Lay (2015) find evidence of increased formal-sector wages without any adverse effects on formal-sector employment, but in contrast to Magruder, find no effects in the informal sector.

On the broader impact of MWs in Indonesia, evidence from Kim and Williams (2021) suggests that higher MWs reduce bargaining power for women relative to men. Furthermore, Majid and Behrman (2023) show positive effects of MWs on children's HAZ scores. In contrast to the present study, this study only utilises one round of data (2007 wave of the IFLS) and does not leverage the longitudinal nature of the IFLS nor examine a broader set of health effects on parents or children. Neumark (2023) and Leigh et al. (2019) discus*ses recent papers studying the broader effects of MWs on health and other household outcomes, mostly from HICs. Leigh et al. (2019) finds that most studies suggest limited effects of MWs on health behaviors with little consistency in most other health behaviors or health outcomes. Both reviews criticise overall weak designs and call for the need for high-quality studies with well-defined treatment (likely affected) and control (unaffected) groups and longitudinal data to help rule-out confounding influences. A strength of our paper is that we fill in methodological gaps in empirical design identified by these reviews by using treatment and control groups (low- and high-wage samples), longitudinal data (over 21 years), a variety of fixed-effect models to control for time-invariant unobserved factors, and robustness/falsification tests (e.g., with different wage-bin thresholds).

Our paper is also broadly related to a large literature on cash transfers. Multiple reviews of the literature on conditional/unconditional cash transfers find evidence on increased healthcare utilization but mixed evidence on health outcomes (Richterman et al., 2023; Pega and Liu, 2022; McGuire et al., 2022; Del Boca et al., 2016; Behrman and Hoddinott, 2005). Furthermore, in contrast to child and adolescent health, much less is known about effects on adult/parental health outcomes (Laszlo et al., 2023; Haushofer and Shapiro, 2016; Behrman and Parker, 2013).

3 Institutional Background

The Indonesian MW policy, initiated in the early 1970s during President Suharto's "New Order", aimed to ensure access to basic consumption for the impoverished. The government set MWs based on the estimated value of basic consumption bundles (Suryahadi et al., 2001). Monthly MWs apply to all full-time workers and are revised on an annual basis to adjust for living costs, inflation, and labor-market conditions (Manning and Roesad, 2007). MWs are set at the provincial, not the national level. Therefore, Indonesia is one of the few LMICs that have rich cross-provincial as well as time variation in MWs. Indonesia also has relatively frequent annual MW adjustments in contrast to many countries such as the US.

Before 2001, the Ministry of Manpower set provincial MWs based on recommendations from provincial governors. Starting in 2001 they were set directly by the latter. Representatives from government, employees (e.g., trade and labor unions), and employers take part in the negotiation, formulating a proposal that is forwarded to the provincial governors (Manning and Roesad, 2007; Widarti and in Jakarta, 2006).

Wage-council meetings begin each year in August or September, with negotiations extending into October or November and sometimes December. The new MW then becomes effective as of January 1st of the following year (Widarti and in Jakarta, 2006). This timeline is relevant for our study as it assures that those children whom we consider to be affected by MWs in any given year of birth are, in fact, fully exposed to the MWs in that particular year.

3.1 Wage distributions and compliance with MWs

Figure 1 shows the normalized wage distribution relative to MWs using province-year specific MWs.[3] Many earn below MWs (to left of 0), but a distinct spike in density is observed around MW levels. More generally, compliance has seen an increase since the mid-1990s partly due to the increased bargaining power of trade unions in wage negotiations in the post-1998 democratic political system.

Bird (2005) finds that formal-sector non-compliance is around 20%. Non-compliance varies across sectors and regions (Bhorat, 2014). Although, compliance primarily pertains to formal-sector wage employees and not informal-sector workers, formal legislation may have spillover ”lighthouse” effects, influencing wages in the informal sector as well. Bigger firms, which are often foreign-owned, export- and capital-intensive, tend to pay higher wages and thus have higher compliance than smaller ones (Suryahadi et al., 2001). For example, workers in medium-sized firms have a 21% higher probability of being paid above the MW than workers in small firms, and workers in large firms a 44% higher probability than workers in small firms. Moreover, female workers have a 19% lower chance of being paid above the MW than male workers (Suryahadi et al., 2001).

Labor inspectors and trade unions help detect MW violations. Failure to comply with MW regulations can lead to industrial strife and governmental sanctions. Criminal sanctions range from one to four years of imprisonment and fines of 100 to 400 million rupiah (USD 6,414-25,655). Lighter sanctions include warnings and administrative measures, such as prohibiting the hiring of foreign and/or outsourced workers.

[3] The exchange rate is 1 IDR to 0.000064 USD as of Nov 2023 based on a google search

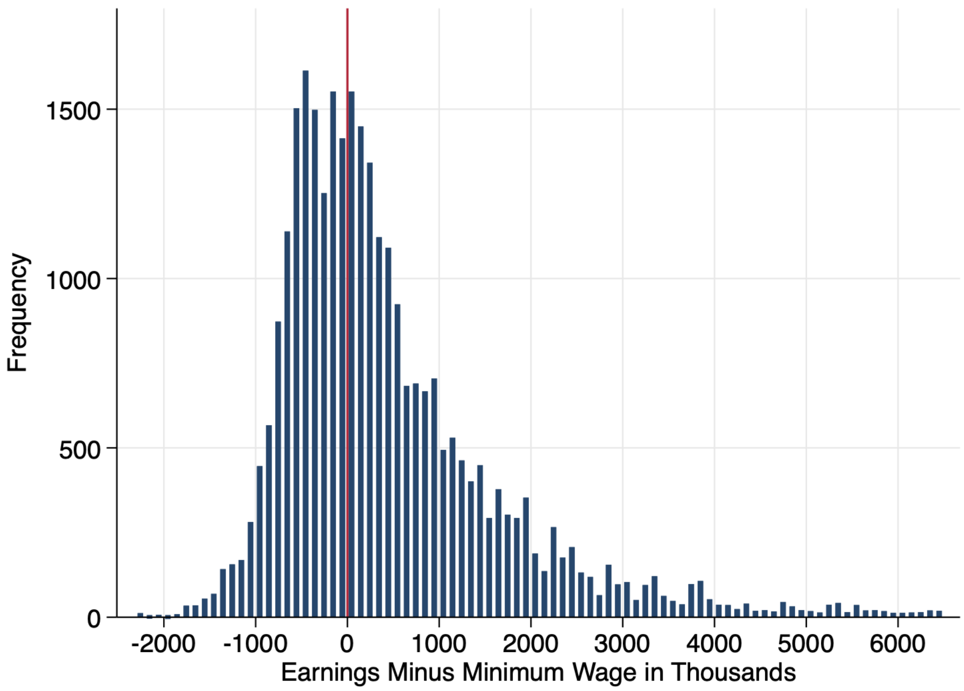

Figure 1: Histogram of Men's Earnings Normalized by MW Across Five Waves (1993, 1997, 2000, 2007, 2014)

4 Data

We use five waves of the Indonesian Family Life Survey (IFLS) covering years 1993, 1997, 2000, 2007 and 2014. This longitudinal survey, which is publicly available from the RAND Corporation, collects data on all individuals in a given household. The IFLS represents 83% of the Indonesian population living in 13 out of 26 provinces. It provides sufficient numbers of observations by province over a long time span such that we can leverage a large variation in MW levels. Attrition is unusually low for data collected in developing countries and at only 8% after five waves.

There is rich information on a wide array of household life aspects: employment, work hours, earnings, children's and adults' health, as well as expenditures. We can retrace the entire household structure, matching children to their parents' labor-market outcomes around the time of birth. Although the survey is not conducted yearly, we have retrospective information on women's pregnancy and birth history, including complications, health care usage and birth outcomes. Moreover, a unique feature of this data set is that it offers high-quality bio-marker measures such as hemoglobin and anthropomorphic data that we use to measure children's health.

We restrict our analysis to those who lived in households in which the household heads have not moved across provinces and waves. The overwhelming majority - 92-93% of cases in our samples - have not moved across provinces, so this restriction is not very limiting. Our analysis on children's health drops children born during years of the Asian Financial crises, as these years were outliers. This choice, however, does not change our estimates in important ways.[4]

We constructed a panel of provincial MWs that covers the years 1993-2014 from the Indonesian Bureau of Statistics and Indonesian Ministry of Manpower. We also obtained data on the consumer price index (CPI) at the province level to compute real provincial MWs. Lastly, we also constructed provincial GDP and unemployment as controls.[5]

4.1 Summary Statistics: Variation in MWs

Figure 2 shows changes in MWs over time and across provinces. Real MWs tend to increase over time, although there are also periods in which they fall. The rates of change (slopes) vary across provinces, suggesting significant variation in MWs across space and time. Table A.1 in the Online Appendix A shows summary statistics at the province-year level for MWs, weighted by population sizes. The real mean monthly MW (weighted by population size) is a little less than 1 million Indonesian Rupees (IDR) (857,030), varying between 0.418 million IDR to 2.3 million IDR across province-year. Whereas MWs were approximately 0.586 million in 1993, they more than doubled to 1.266 million by 2014. Keeping in mind the literature and policy debates around consequences of doubling the MWs (Rama, 2001; Campos-Vazquez and Esquivel, 2021), and that MWs doubled in our period of study, we will present our main findings in terms of a 1 million IDR increase in monthly real MWs (roughly doubling of MWs from mean real monthly MWs).

[4] Results available upon request.

[5] Supplementary data used in this study can be found at: a) https://www.bps.go.id/index.php and b) https://www.rand.org/labor/FLS/IFLS.html

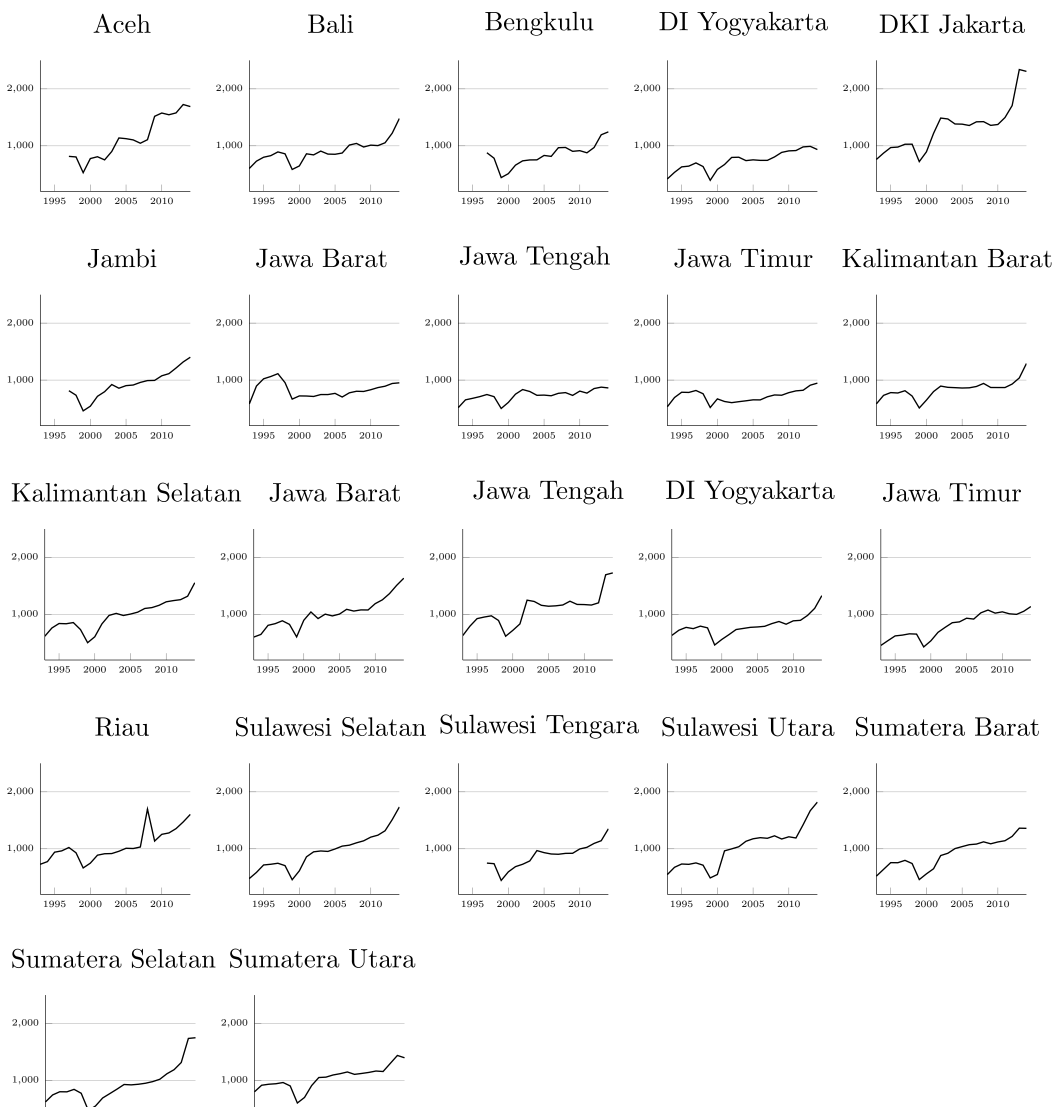

Figure 2: Real Minimum Wages in Indonesian Provinces 1993-2014 in 1000s Rupees

4.2 Summary Statistics: Health and Economic Outcomes

Table A.2 shows summary statistics for economic and health outcomes for married men and women aged 18-55 covering survey rounds in 1993, 1997, 2000, 2007, and 2014. Across all our analysis on adults, we restrict our sample to those who are no longer in school.[6] Similar patterns are observed for married couples with children (as most married couples have children in our sample). We report educational and income variables for men and husbands of married women. High Education indicates men's or husbands' highest level (for the female sample) obtained is secondary education or more. High Income takes value one if the man or husband's real monthly income for their primary job in the previous wave was above 120% of the MW level at the time. Employment is a dummy for paid employment, salaried or self-employment. It includes part-time and full-time work. Work hours are unconditional hours (zero if not working). Hemoglobin in g/dL was measured using capillary blood and a HemoCue analyzer (see IFLS user guides for additional details on the measurement of hemoglobin). For all our key variables we have large samples (e.g. N exceeds 30,000 for earnings and exceeds 24,000 for hemoglobin). Men's mean monthly real earnings are 13,086,600 IDR, with a standard deviation (S.D.) of 1.3 million IDR. Women's monthly real earnings average much lower at 398,000 IDR, with much less variation, a S.D. of 858,000 IDR. Whereas men work about 45 hours per week, women work about 43 hours per week (conditional on employment). Almost all men are employed (95%), whereas only 43% of women are employed. Men on average have Hg of 14.35 g/dL which is

[6] Given that the decision to work or schooling could itself have been endogenously affected by MWs, we verified that MWs do not predict whether one is in school or not/has completed schooling

higher than the average Hg for women at 12.44 g/dL. Given the WHO cutoff of being anemic below 11.6 g/DL for women and 13.2 g/dL for men, 16% of men and 33% of women are anemic.

Table A.3 in Online Appendix A shows summary statistics for (HAZ for children with at least 1 biological sibling aged 24 months-83 months, born between 1993 and 2013 (except 1998 and 1999 - the years of the Asian Financial Crisis). The average HAZ is -1.34 which suggests that the average child is moderately stunted in our sample. The sample size is large - 6226 observations for HAZ of children with 1 or more biological siblings. This provides us with sufficient sample size to conduct mother-fixed-effect regressions. The age restriction of 24 months onwards allows us to utilize more accurately measured height data (standard practices are to measure children laying down for children under 24 months but standing for children 24 months or older). It also gives sufficient time to have passed to allow us to see longer-run impacts on the height from MW changes in the first 1000 days of life. To determine HAZ, we use WHO's 2006 standards and drop outliers with HAZ greater than 5 or HAZ less than -5 (Group and de Onis, 2006; **?**).

Table A.4 in Online Appendix A shows summary statistics for pre-term births (less than 40 weeks) and number of pregnancy complications for all live births. The sample is restricted to those with at least 1 biological sibling to permit mother-fixed effect analyses. On average 13% of births are pre-term and there are an average of 0.24 pregnancy complications reported with a maximum of 5 reported complications.

Finally, Table A.5 in Online Appendix A shows summary statistics for all households with male heads aged 18-55 years of age in the survey years 1993, 2000, 2007, and 2014. The average household size is 3.97, 39% of household heads have high education and 44% have high incomes. On average, 231,470 IDR is spent (real terms) on animal proteins on a monthly basis. There are 43,259 observations for the protein-expenditure variable.

5 Econometric Models

5.1 Adults

We use the following equation to estimate the reduced-form effects of MWs on adult/parental outcomes of interest:

$$Y_{ipt} = \alpha_0 + \alpha_1 MW_{pt} + \alpha_2 X_{ipt} + g(t) + \gamma_i + \varepsilon_{ipt} \tag{1}$$

where Y_{ipt} is a vector of labor-market and health outcomes of interest for adult i living in province p and observed in year t. MW_{pt} is a vector of real MWs by provincial levels p in year t. We include controls for all time-invariant unobserved factors that determine differences in outcomes across adults with individual fixed effects (γ_i). We thus control for variables like education, height, genes, ethnicity, permanent income as well as community- and province-specific factors that shape determination of labor legislation and health and outcomes of men and women. As part of X_{ipt}, we control for age, age squared and province fixed effects. g(t) represents year fixed effects to control for other unobserved time-related characteristics as well as provincial GDP per caipta and lagged unemployment rates. In sensitivity analysis, we also report estimates for models that drop provincial fixed effects and lagged unemployment rates. ε_{ipt} is an error term that includes measurement error in Y.

Models are also estimated to assess heterogeneous treatment effects in (1): We estimate a lagged-wage model to measure how changes in MWs from period t-1 to period t affect the percentage changes in adult outcomes from period t-1 to period t depending on the period t-1 distribution of wages of men (Neumark et al., 2004; Chun and Khor, 2010). Those that earn (or whose spouses/fathers) earned at or below 120% of the MW level in the period t-1 are categorised as belonging to the low-wage bin in period t, while their counterparts who earned above 120% of the MW level in the period t-1 are categorized as belonging to the high-wage bin (within non-missing wage/earnings data).

We cluster standard errors at the provincial level and report estimates of statistical significance based on wild-bootstrap p-values.[7]

5.2 Households

We also report effects of MW s on household consumption of animal protein-rich diets. The basic model is similar to (1), where instead of individuals, we have households, and instead of individual fixed effects, we have household fixed effects. In terms of other controls, we have controls for the number of household members, provincial GDP per capita, lagged provincial unemployment rate, year fixed effects, and provincial fixed effects. In sensitivity analysis, we also report estimates for models that drop provincial fixed effects and lagged unemployment rates.

[7]Wild cluster bootstrap standard errors are recommended to improve finite-sample inference when the number of clusters is typically less than 50. In our case, there are only 34 provinces (Cameron and Miller, 2015).

5.3 Children

We use the following equation to estimate the reduced-form inter-generational effects of MWs during the year of birth on a range of antenatal and subsequent preschool-age child health:

$$Y_{impt} = \alpha_0 + \alpha_1 MW_{pt} + \alpha_2 X_{impt} + g(t) + \gamma_m + \varepsilon_{impt} \tag{2}$$

where Y_{impt} are the health outcomes for child i of mother m living in province p and pregnant in year t. MW_{pt} is a vector of real MWs by provincial levels p in year t in which child i was born. The sample is restricted to include families with two or more children per biological mother (live births) and we show estimates with controls for γ_m, biological-mother fixed effects. Through biological-mother fixed effects, all time-invariant unobserved factors that determine differences between children's HAZ across mothers are controlled for. For instance, if mothers time their births to take advantage of MWs, all time-invariant factors shaping composition of births are controlled by comparing children of the same biological mother. g(t) represents pregnancy-year fixed effects to control for other unobserved time-related characteristics as well as provincial GDP and lagged unemployment rates to control for important time-varying observed variables. X_{impt} includes controls for children's ages (HAZ), mothers' ages (pregnancy complications), and provincial fixed effects. ε_{impt} is an error term that includes measurement error in Y. Some variables, such as HAZ, are measured with a lag (2 to 7 years after birth), where exposure is measured at the time of birth, whereas for pregnancy complications (and preterm births), we use retrospective birth history files and are able to study continuous MW effects in a given year on complications and preterm births.

For HAZ we also test to see if the estimates effects change with the children's age, as they would be expected to if there is fadeout as found in some studies of investment in early life (Andrew et al. (2018)).

Models are also estimated to assess heterogeneous treatment effects in (2), where sub-group effects are shown by parental labor-market outcomes (fathers in high-wage vs low-wage bins) for the parents of the same children for whom we study child outcomes. These estimates take advantage of the longitudinal data that connects parents' earnings in the past with children's health in a given period. In all our models, we cluster standard errors at the provincial level and report estimates of statistical significance based on wild-bootstrap p-values.

6 Results

Adult/Parent labor-market outcomes: Table 1 shows intent-to-treat (ITT) estimates of model (1) for married adult men and women (18-55 year olds) for real monthly earnings (in Indonesian Rupiahs/IDR) from one's primary job, that include earnings from self-employment and are unconditional on employment. A 1,000,000 IDR increase in real MWs is associated with a 188,000 IDR increase in earnings for men, consistent with an elasticity of about 0.19, and statistically significant at 0.1%. However, we don't find any statistically significant effects on women's earnings (at 10% level). When we study sub-samples by lagged-wage bin, we find statistically significant effects (at 0.2% level) for men in the low-wage bin but statistically insignificant (and smaller) effects for men in the high-wage bin. In Appendix Table1 A.6 we show estimates for effects on two more outcomes: a) Hours Worked: normal weekly hours worked from the primary job (excludes zeros); b) Employment: Employment in formal or informal work. We find null effects on hours worked and employment for men and women. This suggests that the MW effects are driven primarily by a pure income effect that raises earnings for married men without affecting their hours worked or those of women. However, the responses of men's earnings to MWs are fairly inelastic, which is consistent with imperfect compliance to MW laws and relatively inelastic male labor supplies in LMIC settings (Goldberg, 2016; Rosenzweig, 1978).

Household Protein Expenditures: One pathway through which MWs may improve parental and child health is through increased intake of nutritious foods, which become more affordable due to higher real MWs. To test this, we study the effects of MWs on expenditures on animal-source protein-rich foods. Animal-source protein-rich food can help reduce anemia and improve birth-related and early life outcomes (Puentes et al., 2016; Dasgupta et al., 2023). Table 1 shows results estimating equation (1) at the household level with household fixed effects. We find that a 1 million IDR MW increase leads to a 49,600 IDR increase in expenditures (elasticity of 0.05) on animal proteins, which suggests a mechanism through which MWs may affect parental and child health. The effects are most precisely estimated for households with household heads who earned low wages. A 0.05 IDR increase in animal protein expenditures from an 1 IDR increase in MWs is about 26% (0.05/0.19) of the increase in men's earnings due to increases in MWs.

Hemoglobin Among Adults/Parents: In Table 2, we report estimates of equation (1) that have hemoglobin (a biomedical measure of risk for anemia) as the dependent variable. We find MWs lead to (precisely estimated) increases in Hg for men and women, especially among those in the low-wage bins, with point estimates of effects on women generally higher than those for men. A 1,000,000 IDR increase in MWs leads to a 0.39 (0.56) g/dl increase in Hg for men (women) for those in the low-wage bin. In Table A7, we show estimates for anemia. Although the estimates suggest reductions in anemia, the effects of MWs on anemia are not precisely estimated and are statistically insignificant. Hemoglobin is associated with improved health and well-being (Sabatine et al., 2005). Although we are aware of no prior work studying the effects of MWs on hemoglobin or anemia, we can compare our estimates with other well-known/recent studies that have explored alternate policies to reduce adult anemia. The Work and Iron Status Evaluation (WISE) in Indonesia randomly assigned iron supplements to 17,000 adults between 30 and 70 years old. WISE found that low-Hb women who received a treatment of 120 mg of iron every week for a year had an improvement of 0.2 g/dL (Thomas et al., 2003, 2006). Banerjee et al. (2018) found that iron-fortified salt in India showed little-to-no effect on hemoglobin or anemia. Dasgupta et al. (2023) found that beef bans in India decreased hemoglobin by 0.12–0.2 g/dL. An increase in MWs by about 500,000 (50% of monthly MWs) is estimated to lead to roughly 0.20-0.27 g/dL increase, which is broadly comparable to what the WISE and beef-ban studies found.

Pregnancy and child health: In Table 2, we also report estimates of equation (2) to study how increases in MWs during the year of birth affect pregnancy and child-health outcomes. We find that MWs are associated with higher HAZ scores, particularly for children whose fathers are poor. A 1,000,000 IDR increase in MWs is associated with a 0.483 increase in HAZ, with larger and significant effects among low-wage families but insignificant effects among high-wage families. We also find that MWs are associated with fewer complications in pregnancy. These complications include swelling of the feet or legs, difficulty of vision during day, difficulty of vision during night, vaginal bleeding, fever, convulsion and fainting, labor before 9 months. These estimates are most precisely estimated for those in the low-earning groups. In Appendix Table A7 we report additional, less precisely estimated, evidence that MWs may lead to fewer pre-term births as well.

We also examined whether the impacts of MWs during the year of birth on child height-for-age z scores diminish as children grow older due to fadeout (Andrew et al. (2018)) of treatment effects and potential catch-up growth that may benefit control children (Mani, 2012). The identification of governmental policies that consistently bolsters resilience to adversities and facilitate developmental recovery continues to be a crucial focus for research (Almond et al., 2018). To accomplish this, we interacted our birth-year MW treatment variable with the children's age in months at the time of surveys and examined if there was a decline in the effects on HAZ as children grow older. We found no significant evidence of interaction effects between MW and child age for children aged between 2 to 7 years, suggesting that the effects of MW on HAZ do not fadeout over time.[8]

7 Robustness

Tables 3-4 presents the results of a robustness exercise with fewer controls for the main estimates in Tables 1-2. In particular, we drop provincial fixed effects as well as lagged unemployment rates. We find that our main estimates remain robust to dropping these controls. Exceptions are estimates for preg-

[8]Results available upon request.

nancy complications for low-wage samples and earnings for high-wage women samples, that are now borderline insignificant/significant at the 10% level.

Tables A8-A11 conduct a variety of robustness exercises that vary the thresholds used to define low- and high-wage bin groups. The one used in our main tables assumes that those earnings less than 120% of MWs in the previous data round are in the low-wage bin. In our robustness tables, we show estimates with the low-wage bin defined at less than 100%, 110%, 130%, and 140% of lagged MWs. Our estimates show that our main results are robust. The estimates are often largest and most precisely estimated for those in the low-wage bin when it's defined at below 130% or 140% of MWs, with more precise estimates and no effect for high-wage bins when the definition for the high-wage bin utilizes higher thresholds.

8 Discussion

Our results indicate that a 1 million IDR increase in the MW (MW) -a little more than double of MWs or 116% of the mean MWs in our sample - leads to the following effects on average: a 188,000 IDR increase in men's earnings, which, in turn, results in a 49,600 IDR increase in household consumption of animal proteins, leading to a 0.385 g/dL increase in women's/mothers' hemoglobin, as hemoglobin has been found to increase in association with the intake of animal proteins (Dasgupta et al., 2023).[9] Complications during pregnancy decline by 0.536 and HAZ increases by 0.483 standard deviations on

[9]Men's/fathers' hemoglobin increased by 0.2 g/dL but effects were not precisely estimated. However, when we look at the low-wage sample, we find fathers' hemoglobin increases by 0.390 g/dL whereas mother's hemoglobin increases by 0.560 g/dL and effects are more precisely estimated.

average, two to seven years after birth with no evidence of fadeout. The effects are higher among the low-wage sample and insignificant at the 10% significance level for those in the high-wage sample for all the above estimates.[10]

As a percentage of the mean, these results are consistent with a 10% increase in MW leading to about a 1.2% increase in men's earnings. This in turn is associated with a 1.85% increase in household spending on animal protein, and approximately a 0.3% increase in mothers' hemoglobin levels (equivalent to 25% of the mean increase in men's earnings). These effects are particularly pronounced during the year of birth, as a 10% increase in MWs is associated with a 19.3% reduction in pregnancy complications and a 10% increase in MWs is associated with a 3.1% increase in children's HAZ, up to seven years after MWs increases in the year of birth.

These findings are encouraging and relevant for policy, especially considering the mixed evidence on the effectiveness of unconditional cash transfers on child nutrition and skills formation over the life course. Our discovery that the MW effects in this study are primarily driven by a pure income effect is particularly significant. Heckman and Mosso (2014) have been critical of previous studies on income transfers and skill formation because they often fail

[10] We also investigated the impact of MWs on various other birth-related outcomes, such as miscarriages and pre-term births, as well as certain maternal investments, including iron pill intake during pregnancy, length of breastfeeding in months, and whether the mother underwent any antenatal check-ups. Our aim was to determine if alternative mechanisms were at play, but our findings yielded null results. To address concerns regarding the possibility that our pregnancy complication result is an outcome of multiple testing, we estimated Romano-Wolf stepdown adjusted p-values. Our analysis revealed that the influence of MWs on the number of pregnancy complications remains robust.

Furthermore, we did not discover any evidence indicating that overall birth rates were affected by MWs. This suggests that the fertility/quantity-quality trade-off is not relevant in explaining our results related to child health and quality. For the sake of readability, we have not included these additional results in the paper. However, they are available upon request.

to investigate substitution effects or do not provide evidence for pure income effects. Our study enhances the understanding of whether MWs, through pure income effects driven by men's earnings, can impact intergenerational health. Moreover, our findings are significant in relation to the large literature on cash transfers, where cash is typically offered to women. We investigate a scenario where MWs improve men's earnings only, without affecting women's earnings or employment.

The substantial positive effects of sustained increases in MWs over two decades align with previous evidence that MWs have significant "big- push" impacts on earnings and expenditures in Indonesia (Magruder, 2013).

9 Conclusion

While almost all countries have MWs, most research on MWs has focused on HICs, especially the United States, and the direct impacts of MWs on wages and employment. Relatively few studies on MWs in LMICs where most affected people live exist, and especially on the broader impacts of MWs on household members with wage recipients, including health outcomes. This study contributes to filling these gaps in the literature by performing a comprehensive analysis of how MWs in Indonesia, the third most populous LMIC in the world, affect earnings, employment, expenditures on protein-rich foods, parental health and child health using rich longitudinal individual, household, and provincial data.

Exploiting variations in real MWs across time and space as well as individual and biological-mother fixed effects, we find some of the first evidence that MWs positively impact men's earnings and improve adult/parental health as measured by higher hemoglobin/lower risk of anemia, lower pregnancy complications, fewer preterm births and improved HAZ for children up to seven years after experiencing MWs during birth years. These effects tend to be concentrated among poor households. Hence, our results suggest that MW laws might mostly benefit those that are disadvantaged and thereby lower inequality not only in income but also in inter-generational health.

10 Main Tables

Table 1: Effects of MWs on Earnings and Animal Protein Expenditures

	Men's Earnings	Women's Earnings	Household Protein Expenditures
MW	188000	37900	49600
	(0.00375)	(0.517)	(0.0927)
N	31530	36569	43259
Low Wage x MW	154000	7620	44200
	(0.0210)	(0.853)	(0.0483)
High Wage x MW	144000	179000	72300
	(0.119)	(0.121)	(0.147)
N	19265	21560	25273

Wild cluster (province-level) bootstrap p-values in parentheses. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Earnings is unconditional on employment. Real monthly earnings in Indonesian Rupiahs. Controls: age and age squared, provincial GDP per capita and lagged unemployment rate; year, province, and individual fixed effects. Sample covers married women and men aged 18-55, who are not in school, and who live in houses whose household heads have not moved out of province across waves. Real monthly animal protein expenditure is in Indonesian Rupiahs. Controls: number of household members, provincial GDP per capita and lagged unemployment rate; year , province and household fixed effects. Sample covers years 1993, 1997, 2000, 2007, and 2014 for all analyses in this table.

Table 2: Effects of MWs on Parental and Child Health

	Men's Hemoglobin	Women's Hemoglobin	Child HAZ	Pregnancy Complications
MW	0.220	0.385	0.483	-0.536
	(0.212)	(0.0548)	(0.0297)	(0.0227)
N	24109	30679	5835	8209
Low Wage x MW	0.390	0.560	1.72	-0.313
	(0.0150)	(0.0607)	(0.00350)	(0.0590)
High Wage x MW	0.151	0.255	0.774	-0.425
	(0.322)	(0.136)	(0.208)	(0.297)
N	17641	21100	2688	4249

Wild cluster (province-level) bootstrap p-values in parentheses. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Hemoglobin (Hg) measured in g/dL, controls: age and age squared, provincial GDP per capita and lagged unemployment rate, year, province and individual fixed effects. Hemoglobin sample covers all women and men aged 18-55, who are not in school, and have not moved out of province across waves. Waves covered (Hg sample) include 1993, 1997, 2000, 2007 and 2014. Height-by-age z-score (HAZ) for children aged 2 to 7, number of pregnancy complications for women aged 18 to 45, controls: child's gender, child's age (only HAZ), mother's age (only complications), provincial GDP and lagged unemployment rate; birth year, province and biological mother fixed effects. Sample for HAZ/pregnancy complications covers live births in 1993-2014 except 1998 and 1999 (Asian financial crises)

Table 3: Robustness-Earnings and Animal Protein Expenditures

	Men's Earnings	Women's Earnings	Household Protein Expenditures
MW	191000	30800	48800
	(0.00175)	(0.601)	(0.0815)
N	31530	36569	43259
Low Wage x MW	233000	9650	45500
	(0.00500)	(0.818)	(0.0175)
High Wage x MW	28700	168000	54600
	(0.811)	(0.096)	(0.216)
N	19265	21560	25273

Wild cluster (province-level) bootstrap p-values in parentheses. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Columns (1-2): Earnings is unconditional on employment. Earnings are real yearly earnings in Indonesian Rupiah. Controls: age and age squared, provincial GDP per capita, year and individual fixed effects. Sample covers married women and men aged 18-55 who are not in school, and have not moved out of province across waves. Column (3): Deflated monthly animal protein expenditure in Indonesian rupiahs. Controls: number of household members, provincial GDP per capita , year, and household fixed effects. Sample covers years 1993, 1997, 2000, 2007, and 2014 for all analyses in this table.

Table 4: Robustness- Parental and Child Health

	Men's Hemoglobin	Women's Hemoglobin	Child HAZ	Pregnancy Complications
MW	0.210	0.356	0.457	-0.543
	(0.239)	(0.0813)	(0.0645)	(0.0203)
N	24109	30679	6226	8209
Low Wage x MW	0.380	0.465	1.92	-0.399
	(0.0123)	(0.0480)	(0.00225)	(0.114)
High Wage x MW	0.149	0.369	0.726	-0.233
	(0.309)	(0.0833)	(0.137)	(0.342)
N	17641	21100	2808	4249

Wild cluster (province-level) bootstrap p-values in parentheses. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Hemoglobin (Hg) measured in g/dL. Controls: age and age squared, provincial GDP per capita and year fixed effects. Sample covers all women and men aged 18-55 in years 1993, 1997, 2000, 2007 and 2014. Child/pregnancy: Height-by-age z-score (HAZ) for children aged 2 to 7, number of pregnancy complications for women aged 18 to 45. Controls: child's gender, child's age (only HAZ), mother's age (only pregnancy complications), provincial GDP per capita and birth year fixed effects. Sample covers live births and children under age seven born in 1993-2014

11 Online Appendix A

A.1: Provincial Minimum Wages

	Mean	S.D.	Min.	Max.	Obs.
MW All Years	857.03	315.78	418.39	2306.30	83467
MW in 1993	586.40	105.59	418.39	801.95	11397
MW in 2014	1266.20	392.05	862.59	2306.30	24001

Deflated provincial monthly earnings floor in 1000 Rupiahs for years 1993-2014. Statistics from the Adult Sample (weighed by population). MW in all years re-weighed for increasing sample size across years.

A.2: Adult Sample

	Men			Women		
	Mean	S.D.	Obs.	Mean	S.D.	Obs.
Age	37.76	9.03	35978	35.20	9.66	41202
High Income	0.45	0.50	20392	0.44	0.50	22135
Monthly Earnings	1309	1296	31533	398	858	36589
Work Hours	45.13	17.77	29618	39.47	21.57	15357
Employment	0.95	0.21	31791	0.43	0.50	36641
Hemoglobin in g/dL	14.35	1.48	24079	12.44	1.46	30701
Anemic	0.16	0.36	24079	0.33	0.47	30701

Sample covers married men and women aged 18-55 in all waves. High Income indicates if the man or husband's income in the previous wave falls above 120% of the min. wage level at the time. Monthly Earnings in 1000 rupiahs (real) for primary job (unconditional on employment). Work hours are conditional on employment. Hemoglobin measured in g/dL using capillary blood and HemoCue analyzer. Anemia is defined as hemoglobin below 13.0g/dl for men and 12.0g/dl for women.

A.3: Child Sample

	Mean	S.D.	Min.	Max.	Obs.
Year of Birth	2003.36	5.85	1993.00	2013.00	6332
Age in Months	53.28	16.57	24.00	84.00	6332
No. of Children Per Biological Mother	2.34	0.61	2.00	6.00	6332
HAZ score	-1.34	1.28	-4.99	4.76	6226
Height in cm	98.15	11.37	10.70	158.70	6332
High Education	0.44	0.50	0.00	1.00	5986
High Income	0.46	0.50	0.00	1.00	3805

Sample covers all children between 2 and 7 years old in all waves, being born between 1993 and 2013, except birth years 1998 and 1999; children whose parents have not moved between rounds. Sample is limited further to those families with 2 or more biological siblings. High education indicates father's highest education level obtained is upper secondary or more. High Income takes value one if father's income in the previous wave was more than 120% the minimum wage level at the time. HAZ are age and gender specific z scores in height.

A.4: Birth Outcomes Sample

	Mean	S.D.	Min.	Max.	Obs.
Year of Birth	2004.24	5.98	1993.00	2014.00	16420
No. of Children Per Biological Mother	3.12	1.40	2.00	14.00	16420
Pre-term Birth (<40 weeks)	0.13	0.33	0.00	1.00	14007
Number of Complications	0.24	0.55	0.00	5.00	9283
High Education	0.46	0.50	0.00	1.00	15435
High Income	0.45	0.50	0.00	1.00	9327

Sample covers all live births in years 1993-2014, except 1998 and 1999, and for samples with 2 or more biological siblings per mother. Number of complications during pregnancy include swelling of the feet or leg, difficulty of vision during day, difficulty of vision during night, vaginal bleeding, fever, convulsion and fainting, labor before 9 months. High education indicates father's highest education level obtained is upper secondary or higher. High Income takes value one if the father's income in the previous wave was more than 120% the minimum wage level at the time.

A.5: Household Sample

	Mean	S.D.	Min.	Max.	Obs.
Number of HH Members	3.97	2.02	0.00	18.00	45936
Protein Expenditure	231.47	250.53	0.00	2240.09	43259
High Income	0.44	0.50	0.00	1.00	26662
High Education	0.39	0.49	0.00	1.00	33921

Sample covers all households with at least one married individual aged 18-55 in years 1993, 1997, 2000, 2007 and 2014. Deflated monthly animal protein expenditure in 1000 rupiahs. High education indicates head's highest level obtained is upper secondary education or more. High Income takes value one if head's income in the previous wave was less than 120% the minimum wage level at the time.

A.6: Adult Labor Market Outcomes: Labor Supply

	Men		Women	
	Hours	Employment	Hours	Employment
MW	-1.75	0.0148	1.95	-0.000430
	(0.370)	(0.358)	(0.131)	(0.988)
N	29611	31769	15366	36616
Low Wage x MW	-0.722	0.0212	3.61	-0.0231
	(0.821)	(0.423)	(0.353)	(0.550)
High Wage x MW	-2.72	0.0151	0.00363	-0.0139
	(0.18)	(0.440)	(0.999)	(0.796)
N	18173	19404	9479	21581

Wild cluster (province level) bootstrap p-values in parentheses. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Hours worked are unconditional on employment. Controls: age and age squared, provincial GDP per capita and lagged unemployment rate; year, province and individual fixed effects. Sample covers married women and men aged 18-55 , who are not in school, and who live in houses whose household heads have not moved out of province across waves. Survey years: 1993, 1997, 2000, 2007 and 2014.

A.7: Parental Anemia and Pre-term Births

	Men's Anemia	Women's Anemia	Pre-term Births (<40 weeks)
MW	-0.0271	-0.0725	-0.0549
	(0.605)	(0.282)	(0.0995)
N	24109	30679	13331
Low Wage x MW	-0.0705	-0.109	-0.0528
	(0.213)	(0.187)	(0.749)
High Wage x MW	-0.0205	-0.0392	-0.0820
	(0.671)	(0.388)	(0.0765)
N	17641	21100	6295

Wild-cluster (province-level) bootstrap p-values in parentheses. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Anemic indicator takes value one if hemoglobin falls below 12.0 g/dL for women or 13.0 g/dL for men respectively. Controls for Anemia regressions: age and age squared, provincial GDP per capita and lagged unemployment rate; year, province and individual fixed effects. Sample covers married women and men aged 18-55 , who are not in school, and who live in houses whose household heads have not moved out of province across waves. Pre-term births is for children of women aged 18 to 45. and who live in households whose household heads have not moved between provinces across waves Controls for pre-term birth regressions: child's gender, mother's age and age squared (pre-term births), provincial GDP and lagged unemployment rate; birth year, province and biological-mother fixed effects. Sample for pre-term births covers live births and children under age seven born in 1993-2014 except 1998 and 1999 (Asian financial crises)

A.8: Robustness to Alternate Low/High Wage Bins: Adult Labor Market Outcomes

	Men's Earnings	Women's Earnings
Low Wage (<MW)	217000	-6390
P-value	0.00400	0.877
High Wage (>=MW)	98800	178000
P-value	0.268	0.103
N	19265	21560
Low Wage (<110% x MW)	194000	-8440
P-value	0.00525	0.812
High Wage (>=110% x MW)	138000	197000
P-value	0.189	0.107
N	19265	21560
Low Wage (<130% x MW)	158000	13300
P-value	0.0243	0.786
High Wage (>=130% x MW)	139000	178000
P-value	0.146	0.135
N	19265	21560
Low Wage (<140% x MW)	179000	20100
P-value	0.0250	0.669
High Wage (>=140% x MW)	121000	179000
P-value	0.235	0.111
N	19265	21560

P-values are wild bootstrap cluster-adjusted p-values at provincial level. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Earnings unconditional on employment. Earnings are real yearly earnings. Controls: age and age squared, provincial GDP per capita, lagged provincial unemployment rate, year, individual, and province fixed effects. Sample covers married women and men aged 18-55 who are not in school and who belong in households whose households heads have not moved in between provinces. Survey years include 1993, 1997, 2000, 2007 and 2014.

A.9: Robustness to Alternate Low/High Wage Bins: Adult Health

	Men's Hemoglobin	Women's Hemoglobin
Low Wage (< MW)	0.415	0.512
P-value	0.0238	0.191
High Wage (>=MW)	0.148	0.330
P-value	0.265	0.0408
N	17641	21100
Low Wage (<110% x MW)	0.392	0.534
P-value	0.0290	0.116
High Wage (>=110% x MW)	0.144	0.311
P-value	0.314	0.0563
N	17641	21100
Low Wage (<130% x MW)	0.365	0.535
P-value	0.0372	0.0705
High Wage (>=130% x MW)	0.149	0.271
P-value	0.339	0.103
N	17641	21100
Low Wage (<140% x MW)	0.368	0.540
P-value	0.0310	0.0527
High Wage (>=140% x MW)	0.120	0.269
P-value	0.527	0.124
N	17641	21100

P-values are wild bootstrap cluster-adjusted p-values at provincial level. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Hemoglobin measured in g/dL. Controls: age and age squared, provincial GDP per capita, lagged provincial unemployment rate, year, individual, and province fixed effects. Sample covers married women and men aged 18-55 who are not in school and who belong in households whose households heads have not moved in between provinces. Survey years include 1993, 1997, 2000, 2007 and 2014.

A.10: Robustness to Alternate High/Low Wage Bins: Child Health Outcomes

	HAZ	Pregnancy Complications
Low Wage (<MW)	1.49	-0.393
P-value	0.00175	0.106
High Wage (>=MW)	0.928	-0.372
P-value	0.181	0.233
N	2688	4249
Low Wage (<110% x MW)	1.37	-0.298
P-value	0.00800	0.116
High Wage (>=110% x MW)	1.01	-0.462
P-value	0.139	0.238
N	2688	4249
Low Wage (<130% x MW)	1.88	-0.336
P-value	0.00275	0.0553
High Wage (>=130% x MW)	0.558	-0.397
P-value	0.311	0.339
N	2688	4249
Low Wage (<140% x MW)	1.55	-0.316
P-value	0.00800	0.0628
High Wage (>=140% x MW)	0.771	-0.449
P-value	0.281	0.358
N	2688	4249

P-values are wild-bootstrap cluster-adjusted p-values at provincial level. All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Height-by-age z-score (HAZ) for children aged 2 to 7 years measured with child standing. Sample for number of pregnancy complications consists of women aged 18 to 45. Controls: child's gender, child's age and its squared (only HAZ), mother's age and its squared (preterm birth, pregnancy complications), provincial GDP and lagged unemployment rate; birth year, province and biological mother fixed effects. Sample covers live births in 1993-2014 except 1998 and 1999 (Asian financial crises). All samples limited to those households whose household heads haven't moved across provinces between rounds.

A.11: Robustness: Alternate Low/High Wage Bins: Household Animal Protein Intake

	Expenditures
Low Wage (<MW)	50800
P-value	0.0325
High Wage (>=MW)	61000
P-value	0.145
N	25273
Low Wage (<110% x MW)	45700
P-value	0.0280
High Wage (>=110% x MW)	71100
P-value	0.134
N	25273
Low Wage (<130% x MW)	47100
P-value	0.0285
High Wage (>=130% x MW)	70200
P-value	0.167
N	25273
Low Wage (<140% x MW)	54600
P-value	0.0140
High Wage (>=140% x MW)	57700
P-value	0.285
N	25273

P-values: Wild-cluster (province-level) bootstrap p-values . All estimates show effects of 1,000,000 Indonesian Rupiah increase in MWs. Expenditure: Real monthly animal protein expenditure is in Indonesian Rupiahs. Controls: number of household members, provincial GDP per capita and lagged unemployment rate; year, province and household fixed effects. Sample covers years 1993, 1997, 2000, 2007, and 2014 .

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