Intergenerational Correlations of Health Among Older Adults: Empirical Evidence from Indonesia

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Abstract

It is widely believed that family background has a significant influence on children's life. The vast majority of the existent literature has focused on the relationship between parents' education and income and the education and income of their children. Surprisingly, much less work has been done on the intergenerational transmission, or correlations of health. The main objective of this paper is to examine the correlations of health across generations using the Indonesia Family Life Survey (IFLS). We take advantage of the richness of IFLS and examine several health measures of respondents, including self-reports and biomarkers. As measures of health of both parents, IFLS has information on whether they are dead at the time of the last wave in 2007, their general health status and whether they have difficulties with any ADLs at the time of the survey or just before death. The findings suggest strong intergenerational correlations between the measures of parental health, schooling, and the health of their adult children. We also examine how these intergenerational correlations might differ for respondents born in the more developed parts of Indonesia compared to the less developed areas. Interestingly, these health associations are much lower for respondents who were born in Java or Bali. These are areas of Indonesia that have experienced the most rapid economic growth over the past 40 years. This suggests that being born and growing up in developed areas, which may have better health infrastructure, substitutes for the influence of parental health.

Keywords: Intergenerational, transmission, health, elderly, Indonesia

JEL Codes: I15, I19

1. Introduction

It is widely believed that family background has a significant influence on children's life. For instance, Bowles et al. (2002) show that economic status is transmitted from parents to offspring and moreover, the extent of intergenerational transmission of economic status is considerably greater than what people generally thought it to be a generation ago.

The vast majority of the existent literature has focused on the relationship between parents' education and income and the education and income of their children. Surprisingly, however, much less work has been done on the intergenerational transmission of health, although more has been done recently (eg. Almond and Chay, 2006; Currie and Moretti, 2007; Bhalotra and Rawling, 2009; Bhalotra and Rawlings, 2011; Venkattaramani, 2011). Health is regarded as an important part of human capital. Better health makes people more productive, and in turn may increase future earnings whereas poorer health causes low productivity, lower happiness and more expenditure on medical care, leading to reduced income and less opportunities for wealth accumulation. Therefore, it seems reasonable to extend our research interest towards dimensions of health.

The main objective of this paper is to examine the correlations of health across generations using the Indonesia Family Life Survey (IFLS). The IFLS is a panel survey covering 14 years from 1993 to 2007 and collects extensive information at the individual, the household, and the community level, including indicators of economic and non-economic well-being. In particular, the survey contains a rich set of information on health outcomes of respondents, including both biomarkers and self-reports. IFLS is a well suited data set for our research because it includes detailed information about parents even if they live apart from their children and the information is collected either at the time of the survey or just prior to death if they are dead. IFLS thus allows us to capture the latest health information of each parent. These parental health variables, together with measures of parent's education, are used in this paper as covariates to explore the intergenerational correlations of health with health measures of older respondents, while controlling for age and birth district of the respondent.

We take advantage of the richness of IFLS and examine several health measures of respondents, including self-reports and biomarkers: a measure of self-reported general health status; the number of measures of physical function and activities of daily living (ADLs) that the respondent reports having difficulty in conducting; the number of instrumental activities of daily living (IADLs) the respondent reports having difficulty with; a measure of cognition measured by word recall; hemoglobin; total and HDL cholesterol; hypertension; an index of depression (the 10 question CES-D) and body mass index (BMI).

As measures of health of both parents, IFLS has information on whether they are dead at the time of the last wave in 2007, their general health status and whether they have difficulties with any ADLs at the time of the survey or just before death.

To focus on older adults, the sample is restricted to respondents who are 50 years and older in 2007. This paper uses multivariate analysis in order to examine the intergenerational transmission of health. First, a cross-sectional analysis is employed by using the information from IFLS4; this allows us to investigate the maximum number of health outcomes. Dependent variables, in this case, are the measures of respondent health status measured in 2007. Having parental health variables and schooling as right-hand side variables along with respondent's age at baseline enables us to look at the intergenerational correlations with the levels of health measures as well as for the changes in health. Second, a simple growth model is used with changes in a restricted number of health measures from 1993 to 2007 as outcome variables (changes between 1997 and 2007 are used in the cases for which 1993 data are not available but 1997 data are). These growth or change regressions are estimated for respondents who were 50 and above in 2007 and interviewed for both 1993 (or 1997) and 2007.

We are careful not to interpret these relationships as necessarily causal, because there exist the usual issues of omitted variables and possibly measurement error in parental health. Thus we cannot identify the exact pathways that may explain these correlations. If an elderly parent is still alive, for instance, this is an indication that that parent has had good health, which may well have indeed been transmitted to the respondent. However many other factors may be associated with this as well, such as a good health and nutrition environment when the respondent was young or good health behaviors of the respondent as a child and as an adult, which may partly have been influenced by health behaviors of the parent. On the other hand, a parent having survived to 2007 also will be correlated with high levels of SES of the parent, which may have different effects on respondent health. Still, given the dearth of estimates of intergenerational correlations of health, we think that these findings make a useful first step contribution to the literature.

The findings suggest strong intergenerational correlations between the measures of parental health, schooling, and the health of their adult children. For example, if parents had more difficulties with ADLs, their children are more likely to have the same problem when they become older adults. Having a dead father is associated with increases in the number of ADLs and IADLs that women report having problems with, a higher likelihood of being underweight for women, as well as with lowered cognition for women. Having a dead mother is correlated with a greater likelihood of having hypertension and being underweight for both men and women, having hemoglobin level below the threshold for men, and also with reporting poor health for women.

The health correlations are stronger in magnitude for the cross-sectional analysis using the 2007 wave than are the changes between 1993 (or 1997) and 2007. This suggests that the intergenerational influences are already established by the time the respondents are 36 years and over in 1993 (or 40 and over in 1997).

We also examine how these intergenerational correlations might differ for respondents born in parts of Indonesia that were developing more rapidly, compared to areas developing less rapidly. Currie and Moretti (2007) have found weaker intergenerational correlations of health in the United States for parents born in better off areas. Bhalotra and Rawlings (2009) have found a similar result using cross-country evidence. In Indonesia, these health associations are much lower for respondents who were born in Java or Bali. These are areas of Indonesia that have experienced the most rapid economic growth over the past 40 years, but that were also more developed than other areas of the IFLS sample in the past (Dick et al 2002). This suggests that being born and growing up in developed areas, which may have better health infrastructure, substitutes for the influence of parental health.

The rest of the paper is organized as follows. Section 2 provides a brief review of the related literature. Data description and the empirical specification used are described in section 3. The main regression results are discussed in section 4. Concluding remarks follow in section 5.

2. Literature Review

Although there are numerous studies which analyze the intergenerational correlation of earnings, wealth or education, a limited number of studies exist that examine intergenerational correlations of health. The pathways that may lead to such correlations include intergenerational transmission of health from parents when they were young children to respondents when they were young, and subsequent impacts of health during early childhood on health in later life. Other pathways may exist, more direct, from parental health as an older adult to respondent health as an older adult. Most past research on intergenerational transmission of health has focused on the first of these pathways.

Numerous papers now have investigated the associations between early childhood health and environment, and later adult health height (see, for example, Elo and Preston, 1992; Barker, 1994; Godfrey and Barker, 2000; Crimmins and Finch, 2004, 2006; Case et al., 2002, 2005; Smith, 2009; and Almond and Currie, 2011, among many papers). Some papers have looked at associations between height and health outcomes as adults, generally finding strong relationships (eg. Case and Paxson, 2008, 2009, 2010; Deaton and Arora, 2009; Smith, 2009 and Smith et al., 2012). Height as an adult is highly related to childhood height, which is a good marker of overall childhood health (Martorell and Habicht, 1986). A study very relevant to this paper is that by Maccini and Yang (2009), which examines the influence of weather conditions at the time and district of birth on health, schooling completed and socioeconomic outcomes in later life, using IFLS data. Their results find that higher rainfall in early life has a large positive effect on good health outcomes for adult women but not for men.

These and many other studies show that health in very early childhood is strongly correlated with parental characteristics, which represents an indirect link between the socio-economic (SES) characteristics of parents and the health of their children later in life through their children's health in early life stages. Some direct evidence on the links between respondent health as a child and health of the parents when they were children exists, and more research has been done on this topic in recent years. Using data from British National Child Development Study in 1958, Emanuel et al. (1992) demonstrate that infant's birth weight is positively correlated with mother's birth and non-pregnant weight. Thomas et al. (1990) show that mother's height is positively correlated with child survival in Brazil, controlling for mother and father schooling and household resources. Almond and Chay (2006) use difference in difference regressions to compare maternal health and birth outcomes for black and white women born in the late 1960s to those born in the early 1960s. They suggest that due to the federal antidiscrimination effort, black women born in the late 1960s are healthier and in turn, they are less likely to deliver babies with low birth weight and low APGAR scores as compared to those born earlier. Currie and Moretti (2007) relate birthweight of mothers to that of their children in the US, and use family fixed effects for the mothers (ie. sisters) to help control for unobservable effects. Bhalotra and Rawlings (2009, 2011) use micro data across many countries to investigate correlations between mother's height and child survival. Venkataramani (2011), uses data from Vietnam to investigate the correlations of height between parent and child. Earlier studies showing strong correlation of parental and child heights include Horton (1986) and Thomas, Strauss and Henriques (1990).

Of particular interest for this study, both Currie and Moretti (2007) and Bhalotra and Rawlings (2009) find that the intergenerational correlations of health are weaker when the mothers were born in higher income areas. This suggests substitution between conditions when the mother was a child and intergenerational transmission. Such conditions may include better health conditions and better health infrastructure when the mother was young.

The studies discussed above relate parental health variables (eg. height) that proxy for health as a child with health measures of their children. Combined with the evidence on early life origins of later life health discussed above, these studies strongly suggest that parental health in old age and their children's health in their old age should be correlated. However direct evidence on these links is very scarce. This paper helps to fill in that gap.

3. Data and Empirical Specification

3.1. Indonesia Family Life Survey (IFLS)

This paper uses the data from the 1993, 1997, 2000 and 2007 waves of the Indonesia Family Life Survey (IFLS). This is a large-scale socio-economic survey conducted in Indonesia which contains extensive information collected at the individual, the household and the community levels. The survey includes not only indicators of economic but also non-economic well-being such as consumption, income, education, assets, migration, fertility, use of health care, health insurance, marriage, kinship among family members and labor market outcomes (see Strauss et al., 2009).

IFLS fits the purpose of this paper since it collects a rich set of information on health outcomes including biomarkers and self reports for both respondents and their parents. IFLS contains detailed information of parental health such as whether they had ADL problems and they were in a poor health condition before their death if they are dead, or at the time of the survey.

Any longitudinal study like this comes with a potential worry: sample attrition. Fortunately, the attrition rate in IFLS is very low compared to other panel data sets. In particular, 7,224 households were interviewed and detailed individual level information was collected from over 22,000 respondents in IFLS1, conducted in 1993. The re-contact rate was 93.6% of original IFLS 1 households in IFLS 4. Overall, among IFLS 1 original respondents over age 15 in 1993 who were still alive, 88% of them were re-contacted in IFLS4. Among age groups, the highest re-contact rates (over 90%) are for those who were older than 40 years in 1993 (see Thomas et al., 2012, for details).

It has been challenging to find direct evidence of health transmission between parents and their adult children because it requires well designed survey data having detailed health information of both parents and children. IFLS is very attractive because several variables are available to measure the latest health information of each respondent's biological mother and father. In examining the relationship between parental health and their adult children's health, multivariate regression is used in two ways; cross-sectional analysis and a growth model.

In both sets of estimates, parental characteristics are treated as time-invariant characteristics. This paper focuses on adults who are older than 50 years and it means their parents are at least 65 years and older in the sample. Since IFLS is a longitudinal study, it collects very detailed information of parental health in each wave. Health information from the 2007 wave is available for those who are still alive and even if they have passed away as IFLS collects the information as of just before their death. If respondents do not live together with their parents, it is respondents (adult children) who are interviewed about the health status of their biological mother and father. In IFLS4, respondents are asked about the current health status of their non-coresident parents if their parents are still alive or the latest health status if parents died before 2007. Therefore, for non-coresident parents, the health information collected from their adult children in IFLS4 is used to construct parental variables. For parents who live together with their children, parents are directly interviewed about their health status. If they are alive in 2007, the health information from IFLS4 is used but if they died between the surveys, the information from the last wave they are found alive is used.[1]

Specifically, dummy variables are created for being dead in 2007, difficulties with ADLs and general health status (GHS) at the survey, or just before death. The parents' death dummy variables, one for each biological parent, are equal to 1 if the parent was dead at the time of IFLS 4, in 2007. In the sample, only 5% of the fathers and 16% of the mothers were still alive at the time (Table A1), so this dummy variable indicates a particularly healthy parent if it is 0. We also know the date of death for many of those who died. Hence we also tried dummies for death before age 60, death after age 60, and died but age of death missing. An F-test shows that these turn out not to be significantly different from each other for either the three father death coefficients or the three mother death coefficients. In regressions for poor general health the F-statistics are 1.26 (p-value: 0.28) for women and 0.24 (p-value 0.91) for men. For the other health outcomes the pattern is the same. Therefore, in the main specifications we use the dummies for death.

A dummy variable for a measure of general health status of each parent is also constructed. It equals 1 if the parent is reported to be in poor heath in 2007 or right before their death if they are dead; about half for both mothers and fathers (Table A1). For difficulties with ADLs, the dummy variable takes value 1 if the parent experienced problems with any ADL in 2007 or before they died; about one-quarter for both mothers and fathers. The level of schooling of each parent is controlled by creating dummy variables for each level completed: primary and junior high school and above, no schooling being the omitted category. About 45% of fathers are reported to have had no schooling and about 60% of mothers (Table A1). A little less than 20%

[1] For co-resident parents, if they died in 1996, the health information from IFLS2(1997) is used and if died before 1993, IFLS 1(1993) is used. However, for non-coresident parents, their information comes from IFLS4(2007) because their adult children are asked about biological parents' health status now or before death.

of mothers are reported to have completed primary school or more, while about 30% of fathers have.

One might imagine that health just prior to death is worse and not necessarily representative of health earlier in life. This appears to be true in our data. Table A2 shows the distribution of the GHS variable separately for mothers and fathers who are still alive and those dead. The distributions are different, worse for those parents who are dead (a chi-square statistic of differences are 40.7 for fathers and 47.5 for mothers; both are significant at under .01). Because of these differences, we allowed for in our empirical specifications, interactions between the mother (or father) dead variable with the mother (or father) GHS variable. It turns out, however, that these interactions are not jointly significant,[2] so they are not reported in our main specifications.

As mentioned above, several health measures which are known to be very important for elderly health are used as dependent variables in this paper. The first one captures measures of physical functioning and activities of daily living (ADLs). It is defined as routine activities that people tend to do every day such as eating, bathing, dressing, toileting, transferring, and continence. Listed in the questionnaire are also physical functioning activities such as carrying a heavy load for 20m, walking for 5km and standing from sitting from the floor without help. In IFLS, respondents are asked whether they can do those activities related to ADLs or physical functioning without any help or difficulties. For this analysis, each answer is recorded as 1 if respondents report that they can do them only with some assistance or not able to do it. In the regression, the sum of the number of difficulties with ADLs is used as an outcome variable; the

[2] The F-statistic for the interactions of mother and father deaths with the mother or father having poor general health in the male poor general health regression is 0.72 (p-value, 0.49). Again, results are similar for other equations.

maximum number of ADL problems that each respondent can have is 9. As shown in Table A1, the mean is 1.79 for women and 1.04 for men.

The second health measure used in the analysis is instrumental activities of daily living (IADLs). While it is not necessary for fundamental functioning, it is still required to be able to live one's life independently. In the questionnaire, respondents answer if they can do particular activities related to IADLs without any difficulties. To shop for personal needs, to prepare one's own meal, to take a medicine and to travel are some examples. Similar to the case of ADLs, each answer is scored as 1 for those who answer that they need help or cannot do any of those activities. Like before, the sum of these values is used in the regression; the means are 1.0 for women and 0.55 for men (Table A1).

General health status (GHS) is also one of the health measures examined in this paper. It is scored as very healthy, somewhat healthy, somewhat unhealthy or unhealthy. For this paper a value of 1 is scored if respondents report their health status as 'somewhat unhealthy' or 'unhealthy', 0 otherwise. Some 29% of women and 23% of men report being in poor health.

The fourth health measure is body mass index (BMI, kg/m^2). Following World Health Organization standards, dummy variables are created for being underweight if BMI is under 18.5 and for overweight if BMI is greater or equal to 25. Increasing overweight has become a problem for the elderly in Indonesia, especially for women (see Witoelar, Strauss and Sikoki, 2012, for details). Table A1 shows that 30% of women over 50 in 2007 are overweight, and 17% of men. Yet underweight is still a problem, for 20% of men and women.

Hypertension is measured following the standard definition of the World Health Organization; its value is 1 for those whose systolic is greater than or equal to 140 or diastolic is greater than or equal to 90. In IFLS4, blood pressure of each respondent is measured 3 times and the mean of the last two measurements is used as dependent variable in the estimation. For earlier waves of IFLS, blood pressure was measured only once. 63% of elderly women and 52% of elderly men have hypertension in 2007 (Table A1).

Hemoglobin levels are examined from blood spots, using the Hemocue meter, as are total and HDL cholesterol, using the Cardiochek PA meter (non-fasting). A dummy variable is created as equal to 1 for those whose hemoglobin level is below the threshold (for men: 13g/dL, for women: 12g/dL)[3]. Some 35% of women and 30% of men have low hemoglobin in 2007.[4] For total cholesterol we create a dummy equal to 1 if the respondent has high total cholesterol (>=240 mg/dL) and for HDL the dummy equals 1 if the level is low (<40 mg/dL). High total cholesterol is 23% among women but only 11% among men, however low HDL is a very big problem, for 39% of women and 65% of men (Table A1).[5]

For cognition, respondents are read a list of 10 simple nouns (i.e. hotel, car or apple) and they are immediately asked to repeat as many words as they can, in any order. After answering questions on depression (after several minutes), they are asked again to repeat as many words as they can. We follow McArdle (2010) and use the average number of correctly immediate and delayed recalled words. The average number of correctly recalled words is 3.22 for women and 3.56 for men (Table A1).

As a measure of depression, respondents answered 10 questions about how they felt during the week before. It is a self-reported depression scale from the short version of the CES-D scale, an often used index internationally. The frequency of depression can be chosen from 4 levels: rarely, some days (1-2 days), occasionally (3-4 days) or most of the time (5-7 days).

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[3] Previous studies such as Thomas et al. (2008) show that the one's work capacity becomes lower if hemoglobin levels are below these thresholds.

[4] This is substantially lower than in 2000 and 1997, see Witoelar, Strauss and Sikoki (forthcoming).

[5] Low levels of HDL are also an issue among the elderly in China (see Crimmins et al., 2011).

Following the standard way of computing CES-D, 0 is scored for those who answered 'rarely', 1 for 'some days', 2 for 'occasionally', and 3 for 'most of the time'. Eight out of 10 questions have a negative theme such as "I feel depressed" or "I feel lonely" and the remaining two questions reflect positive feelings such as "I am happy" or "I feel hopeful about my future". For the positive questions, the scoring is reversed from 0 for 'most of the time' to 3 for 'rarely'. The sum of all scores is used for the analysis and a higher score on the CES-D scale indicates that respondents are more likely to have depression; means are 4.56 for women and 3.90 for men (Table A.1).

3. 2. Empirical specification

The parental health and education variables are used as right-hand side covariates to explore the health of their adult children, who are 50 years and older in 2007. The equation estimated is:

$$H_{i,07} = \beta_0 + \beta_1 Parental\ char_i + \beta_2 Age_{i,07} + \gamma Birth\ district_i + \varepsilon_{i,07} \qquad (1)$$

The latest health status measures of respondents measured in the 4th wave of IFLS are dependent variables in this equation.

Other covariates include dummy variables created for respondent's age: 60-64, 65-69, 70-74, 75-79 and 80 and over. These are necessary because health is highly age dependent and parental characteristics also are correlated with respondent age since respondent age reflects their birth cohort. Indonesia has developed rapidly during the past few decades which in turn led to birth cohort being highly correlated with parental characteristics. For instance, it is more likely that parents of younger respondents had more opportunities for having higher education or faced better health infrastructure. Hence, controlling for respondents' age helps to address the potential association between birth cohort and parental characteristics such as health and education.

The birth district (kabupaten or kota) of the respondent is also controlled for with dummy variables.[6] These dummies will control for contextual factors like prices, health conditions and health infrastructure at birth that affect respondent's health during childhood.[7]

In order to examine the period when these intergenerational correlations are actually established during one's lifetime, a growth model is estimated. For number of difficulties with ADLs, general health status (GHS) and body mass index (BMI), changes in health measures from 1993 to 2007 are constructed as outcome variables. For the other measures such as hemoglobin and hypertension, changes between 1997 and 2007 are used because IFLS has collected this information only since 1997. Similar to the cross-sectional analyses, the sample is restricted to those who are 50 years and older in 2007 and only respondents who were interviewed in both the 1993 (or 1997) and the 2007 waves are kept in the sample. The growth model is

$$H_{i,07} - H_{i,93(97)} = \beta_0 + \beta_1 Parental\ char_i + \beta_2 Age_{i,93} + \gamma Birth\ prov_i + \varepsilon_{i,93} \qquad (2)$$

[6] We first constructed place of birth at the sub-district level, but there were many cells with only one or a handful of observations, so we chose district as our level of aggregation instead. We have 99 of them.
[7] Constructing these dummy variables required examining data from the migration section (MG), as well as the control and demographic roster section (K). The migration section obtains data on sub-district and district of birth, where one lived at age 12 and all long-distance moves since age 12. From that section one can know if the respondent still lives in the place of birth. A difficulty is involved because many districts were divided over time and had their names changed. Since the district of birth information comes from different waves of IFLS for different respondents, we had to convert all district codes and names into a single year equivalent (we chose 1999) to obtain a consistent set. We had crosswalks available from the Indonesian BPS which we used, plus province maps showing all districts. We not only matched numeric codes, but names as well. Sometimes the name had a new number code, which we chose. After deriving a consistent list of districts and codes we found that still, some had only one or a very few number of observations, forcing us to aggregate further. We did so using the district maps to group contiguous districts. We also checked to make sure for the binary dependent variables that none of the districts had all 0s or all 1s. This would cause a problem because the district dummies would then perfectly predict the outcomes. We found some did and so further aggregated, again using our maps.

We also investigate if there is any difference in intergenerational correlations between those who were born in more developed areas and in less developed areas. For this purpose a dummy variable is created as equal to 1 for respondents who were born in Java or Bali (Java dummy) and that is interacted with the parental variables in the equation (1).

Furthermore, we examine the associations between parental SES markers and two important measures of human capital accumulation: attained adult height and years of completed schooling of their adult children.

Finally, in a separate specification, respondent's education and own height are used as covariates for their later health. These are standard proxies to represent the respondent's own SES but they may be argued to be endogenous. Examining the association between one's health and SES is standard and therefore, adding parental variables in this specification enables us to compare if parents' health variables still remain significant and if respondent's SES is significant as well.

It should be noted that the estimates in this paper are not necessarily causal, but they are certainly highly suggestive.

4. Results

4.1. Intergenerational Correlations

Table 1 presents regression results from the 2007 cross-section (equation 1) for the different health measures. For each outcome, the coefficients of parental characteristics and respondents' age are presented, respectively for men (first column) and women (second column).[8] All equations include the birth district dummy variables in order to control for any heterogeneous characteristics of communities at birth. It is possible that respondents who were

[8] Standard errors are presented in parentheses and they are adjusted for clustering at the local community (desa or kelurahan) lived in in 2007, and are also robust to arbitrary forms of heteroskedasticity.

born in more developed areas had better health infrastructures or facilities and controlling for birth place helps to address this issue. To investigate this issue further, the Java-Bali birth province dummy is used later as an interaction term with all of the parental characteristic variables. F-tests for groups of variables, such as the parental health variables, are reported at the bottom of each table.

For many of the health measures the results suggest that there exist intergenerational correlations between the measures of parental health and schooling, and the health of their adult children. For instance, having a father with poor general health status is associated with increases in the number of difficulties of ADLs for men. For women, if the father is dead in 2007 or had ADL problems in 2007, or right before he died, she is more likely to report difficulties in ADLs. For poor general health status, if a father was in a poor health condition, his children are more likely to suffer from the same problem when they become older adults regardless of their sex. Mother's poor health is positively related to men's poor health status whereas having a dead mother is correlated with poor health for female respondents. In the male sample, poor GHS of both parents is related to the increase in number of difficulties with IADLs. Female respondents tend to report more difficulties in IADLs if either parent were dead, if the father had ADL problems, or if the mother had poor general health status.

Men tend to be underweight if the mother had died by 2007, while having a dead mother or a father is positively associated with higher likelihood of being underweight for women. For being overweight, the correlations with parental health are not significant for men, and are at the 10% level for women. For women parental death has the opposite signs as for being underweight, which means that in this case, parent's being dead is negatively associated with a woman being overweight; this is reversed for women whose mothers have ADL problems.

Having low hemoglobin is not correlated with our parental health variables for women, but is for men; in particular, having a dead mother is positively associated with having low hemoglobin. Having a dead mother is associated with a higher likelihood of having hypertension for both men and women, although all the parental health variables jointly are not significant. Our parental health variables are also not jointly significant for either having high total cholesterol or low HDL.[9]

For cognition for women, however, and depression scores for both men and women, parental health is jointly significant at 10% or better. Having a dead father has a negative association with the cognitive ability of women, although having a mother with ADL problems is positively correlated. For men, higher depression scores are positively correlated with parents having poor general health and for women with the mother having poor general health.

As is generally true, higher parental schooling tends to be negatively correlated with poorer respondent health. This is the case for poor general health for men with respect to mother's education, for men's IADL problems with respect to father's education, or with respect to mother's education for women. Similar results are found for having low BMI or low hemoglobin.

Of considerable interest is the fact that the district birth dummy variables are highly jointly significant for all of the health variables we look at, for both men and women. Exactly what characteristics of the birth places that are responsible for this we cannot tell. It could certainly be factors such as levels of infant mortality, and thus exposure to infections and inflammation (eg. Crimmins and Finch, 2004), but also could be other factors associated with economic conditions in the district at birth, such as rainfall (eg. Maccini and Yang, 2009).

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[9] This is not to say that there is no influence of parental health. Had we been able to measure cholesterol for parents before they died, for instance, that might well have been correlated with the measurement of the respondent children.

4.2 Change regressions

In Table 2, the correlations between parental characteristics and the change in health measures of their grown-up children are examined. Having a mother with poor health status is correlated with an increase in changes of number of ADL problems for male respondents. In the female sample, if the father was dead in 2007, the increase in the number of ADL difficulties tends to be larger. Having a father with ADL problems is associated positively with the change in the number of ADL difficulties for women and negatively with the changes in the hemoglobin level for men respectively.

Interestingly, for most of the health outcomes including GHS and BMI, the parental health measures are not as a group significantly correlated with the changes. The results demonstrate that the health correlations are stronger in magnitude for 2007 than are the changes between 1993 (or 1997) and 2007. This suggests that the intergenerational influences are already established by the time the respondents are 36 years old and over in 1993 (or depending on health measures, it is already established in 1997 when respondents are 40 and over).

4.2. Interactions with birth region

As discussed in section 3, it is more likely that respondents had experienced different living environments or access to health infrastructure at birth, depending on their birth places. For instance, respondents who were born in more developed areas probably had better health facilities and a better environment as compared to other areas in the IFLS sample.

In order to investigate whether a different level of development in the area of birth would mitigate or exacerbate the correlation between parental health and their adult children's health, a Java-Bali birth dummy variable is constructed as equal to 1 if respondents were born in either Java (including Jakarta, east, west and central Java and Yogyakarta) or Bali. These areas are and have been the more developed areas in our sample. We interact this dummy with the dummies for each parental characteristic (health and schooling).

Table 3 shows that these health associations are much lower for respondents who were born in Java or Bali. For example, having a dead father is associated with an increase of the number of ADL difficulties for women by 0.53 but this correlation almost disappears once the interaction terms with Java are taken into account. Similar results are shown for men and women's IADL problems. Father's death is correlated with women having a larger number of difficulties with IADLs but for those who were born in more developed areas, this correlation is greatly reduced . The same patterns appear for the association of a mother having poor general health with IADL or ADL problems for men; with cognition for men and depression for women. Likewise, the association of mother's death with low BMI for men is reduced by half for those born in Java or Bali, as is the association of father's ADL problems with low HDL of the respondent.

These results suggest that the level of development at birth or early childhood, which may include having better health infrastructure or facing different health and other prices, substitutes for the influence of parental health.

5. Conclusions

Family background is strongly correlated with various aspects of children's life even when they grow older. This paper examines the dimension of family health correlations which, despite their importance, have not been explored much due to data limitations. IFLS provides a suitable platform to examine the intergenerational health correlations, because it encompasses detailed information of both parents and their adult children.

The findings suggest that there are positive intergenerational correlations between parental health and education, and the health status of their offspring. While these correlations should not be interpreted as causal, they are consistent with the types of intergenerational correlations found for schooling and incomes. These correlations are lower for change in health measures and parental characteristics, suggesting the most of the correlation is established at earlier times in life, before age 36 when we pick up our respondents. Very importantly, these health associations become much lower for respondents who were born in more developed areas such as Java or Bali. Being born and growing up in more developed areas apparently substitutes for influences inherited from parents.

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Table 1_a. Parental SES Gradients of Health of Older Adults

		Poor GHS		# ADL problems		# IADL problems	
		Men	Women	Men	Women	Men	Women
Death	Father	-0.00673	0.00393	-0.0397	**0.208****	0.0510	**0.121****
		(0.0297)	(0.0306)	(0.0994)	(0.102)	(0.0567)	(0.0572)
	Mother	-0.00921	**0.0717*****	0.0302	0.0887	-0.0365	**0.0791***
		(0.0195)	(0.0215)	(0.0649)	(0.0808)	(0.0396)	(0.0449)
GHS	Father	**0.0331***	**0.0590*****	**0.161****	0.0771	**0.113****	0.0128
		(0.0200)	(0.0193)	(0.0730)	(0.0815)	(0.0471)	(0.0481)
	Mother	**0.0514****	0.0116	0.128	0.136	**0.114****	**0.0980****
		(0.0212)	(0.0217)	(0.0805)	(0.0866)	(0.0494)	(0.0486)
ADL	Father	0.0243	-0.00316	0.0231	**0.215****	0.0227	**0.0853***
		(0.0239)	(0.0217)	(0.0848)	(0.0866)	(0.0548)	(0.0492)
	Mother	-0.0123	-0.0116	0.0271	-0.0951	-0.00521	-0.0363
		(0.0232)	(0.0224)	(0.0894)	(0.0919)	(0.0530)	(0.0518)
Father's Education	at least some primary	-0.0185	-0.0314	-0.132	-0.115	**-0.205*****	-0.102
		(0.0319)	(0.0310)	(0.115)	(0.111)	(0.0616)	(0.0662)
	completed primary	-0.00974	0.0140	**-0.158***	**0.177***	**-0.210*****	-0.0309
		(0.0229)	(0.0222)	(0.0804)	(0.0922)	(0.0514)	(0.0550)
	completed junior high school	0.000235	-0.0283	-0.149	0.223	**-0.213****	-0.113
		(0.0370)	(0.0459)	(0.150)	(0.159)	(0.0952)	(0.0878)
Mother's Education	at least some primary	-0.0198	0.0187	0.0389	-0.0273	0.0575	-0.0635
		(0.0364)	(0.0370)	(0.133)	(0.124)	(0.0755)	(0.0671)
	completed primary	**-0.0483****	-0.0302	0.0331	-0.166	0.0637	-0.0705
		(0.0241)	(0.0263)	(0.0803)	(0.104)	(0.0501)	(0.0613)
	completed junior high school	**-0.118****	-0.0418	0.110	**-0.546*****	0.159	**-0.208***
		(0.0464)	(0.0556)	(0.255)	(0.209)	(0.161)	(0.110)
Respondent's age	60 - 65	**0.0483****	0.0135	**0.348*****	**0.594*****	**0.180*****	**0.400*****
		(0.0222)	(0.0207)	(0.0899)	(0.0832)	(0.0548)	(0.0490)
	65 - 70	**0.125*****	**0.0645*****	**0.874*****	**1.087*****	**0.533*****	**0.673*****
		(0.0254)	(0.0228)	(0.102)	(0.0941)	(0.0635)	**(0.0566)**
	70 - 75	**0.193*****	**0.105*****	**1.393*****	**1.633*****	**0.906*****	**1.096*****
		(0.0278)	(0.0285)	(0.140)	(0.123)	(0.0887)	(0.0765)
	75 - 80	**0.193*****	**0.116*****	**1.475*****	**2.486*****	**1.127*****	**1.686*****
		(0.0346)	(0.0343)	(0.173)	(0.180)	(0.114)	(0.103)
	80 -	**0.217*****	**0.164*****	**2.868*****	**3.216*****	**1.632*****	**2.035*****
		(0.0384)	(0.0342)	(0.205)	(0.175)	(0.129)	(0.0912)
Constant		**0.280*****	**0.424*****	0.630	**0.489***	**0.309***	-0.0317
		(0.103)	(0.0820)	(0.390)	(0.277)	(0.185)	(0.101)
R-squared		0.128	0.092	0.291	0.301	0.290	0.344
Sample size		3081	3608	3080	3605	3081	3605

Birth Place (kabupatan) dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
F-test (p-values)						
Age dummy variables	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parent's education dummy variables	0.0400	0.4593	0.5798	0.0699	0.0017	0.0248
Parent's death dummy variables	0.8526	0.0033	0.8430	0.0477	0.4402	0.0167
Parent's GHS dummy variables	0.0001	0.0007	0.0036	0.0430	0.0004	0.0528
Parent's ADL dummy variables	0.5964	0.7867	0.8539	0.0461	0.9140	0.2210
Parent's health (death, GHS, ADL) dummy variables	0.0005	0.0001	0.0050	0.0003	0.0004	0.0014
Parent's health (death, GHS, ADL) + Edu dummy vars	0.0003	0.0003	0.0302	0.0001	0.0000	0.0000
Birth Place dummy variables (kabupatan level)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: IFLS4 Note: Standard errors in parenthesis. (clustered at community level) *** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, GHS and ADL but not reported in the table.

Table 1_b. Parental SES Gradients of Health of Older Adults

		BMI (< 18.5)		BMI (>= 25)		HB(M<13, W<12)	
		MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
Death	Father	-0.00480	**0.0550****	0.0448	-0.0102	0.00541	0.0113
		(0.0280)	(0.0215)	(0.0334)	(0.0370)	(0.0342)	(0.0349)
	Mother	**0.0453*****	**0.0295***	**-0.0378***	**-0.0636****	**0.0693*****	0.0105
		(0.0173)	(0.0156)	(0.0225)	(0.0262)	(0.0221)	(0.0212)
GHS	Father	-0.00121	-0.00997	-0.00256	0.0179	-0.0216	0.0180
		(0.0193)	(0.0170)	(0.0196)	(0.0212)	(0.0206)	(0.0224)
	Mother	0.00295	0.00648	-0.00824	-0.0249	-0.00689	-0.0356
		(0.0202)	(0.0168)	(0.0197)	(0.0222)	(0.0217)	(0.0219)
ADL	Father	-0.00631	0.0189	-0.0315	-0.0349	0.0212	-0.0350
		(0.0227)	(0.0186)	(0.0222)	(0.0228)	(0.0258)	(0.0249)
	Mother	0.00946	-0.0191	0.00991	**0.0444***	-0.0196	**0.0465***
		(0.0206)	(0.0169)	(0.0225)	(0.0243)	(0.0241)	(0.0238)
Father's Education	at least some primary	-0.0189	0.00356	0.0309	0.0471	**-0.0553***	-0.0340
		(0.0267)	(0.0321)	(0.0306)	(0.0371)	(0.0329)	(0.0362)
	completed primary	-0.0160	-0.0261	**0.0600****	**0.101*****	-0.0352	-0.0338
		(0.0211)	(0.0196)	(0.0237)	(0.0265)	(0.0257)	(0.0263)
	completed junior high school	-0.0513	**-0.0894*****	0.0683	**0.188*****	-0.0447	**-0.0776***
		(0.0330)	(0.0257)	(0.0429)	(0.0435)	(0.0418)	(0.0444)
Mother's Education	at least some primary	**-0.0548***	-0.0158	-0.00747	0.0561	**0.110*****	0.0371
		(0.0281)	(0.0301)	(0.0336)	(0.0404)	(0.0391)	(0.0367)
	completed primary	**-0.0572****	**-0.0375***	**0.0728*****	-0.00700	-0.00638	-0.00224
		(0.0242)	(0.0197)	(0.0262)	(0.0326)	(0.0294)	(0.0284)
	completed junior high school	-0.0769*	0.0305	**0.191*****	-0.0564	-0.0332	-0.00420
		(0.0394)	(0.0402)	(0.0689)	(0.0668)	(0.0575)	(0.0589)
Respondent's age	60 - 65	0.0341	**0.0318***	-0.0273	**-0.0490****	0.0389	0.0399
		(0.0224)	(0.0183)	(0.0218)	(0.0229)	(0.0237)	(0.0251)
	65 - 70	**0.0781*****	**0.129*****	**-0.0644*****	**-0.101*****	**0.115*****	**0.0887*****
		(0.0232)	(0.0218)	(0.0195)	(0.0238)	(0.0264)	(0.0248)
	70 - 75	**0.156*****	**0.164*****	**-0.102*****	**-0.151*****	**0.214*****	**0.119*****
		(0.0323)	(0.0263)	(0.0219)	(0.0246)	(0.0321)	(0.0303)
	75 - 80	**0.204*****	**0.145*****	**-0.0702****	**-0.143*****	**0.210*****	**0.184*****
		(0.0409)	(0.0313)	(0.0282)	(0.0290)	(0.0443)	(0.0377)
	80 -	**0.201*****	**0.206*****	**-0.114*****	**-0.207*****	**0.288*****	**0.268*****
		(0.0432)	(0.0370)	(0.0247)	(0.0284)	(0.0405)	(0.0387)
Constant		0.0644	-0.0178	**0.321*****	**0.652*****	**0.200****	**0.367*****
		(0.0558)	(0.0338)	(0.105)	(0.0753)	(0.0789)	(0.0848)
R-squared		0.108	0.110	0.089	0.127	0.126	0.096
Sample size		2974	3482	2974	3482	2979	3474

Birth Place (kabupatan) dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
F-test (p-values)						
Age dummy variables	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parent's education dummy variables	0.0003	0.0001	0.0000	0.0000	0.0848	0.4048
Parent's death dummy variables	0.0327	0.0027	0.1727	0.0439	0.0067	0.8227
Parent's GHS dummy variables	0.9893	0.8303	0.8467	0.5156	0.3704	0.2673
Parent's ADL dummy variables	0.8975	0.4396	0.3163	0.1506	0.6449	0.1363
Parent's health (death, GHS, ADL) dummy variables	0.1624	0.0263	0.3464	0.0516	0.0364	0.4673
Parent's health (death, GHS, ADL) + Edu dummy vars	0.0002	0.0000	0.0000	0.0000	0.0150	0.4529
Birth Place dummy variables (kabupatan level)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: IFLS4 Note: Standard errors in parenthesis. (clustered at community level) *** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables Capturing missing observations are included in the regression for each of the following variables: father/mother's education, GHS and ADL but not reported in the table.

Table 1_c. Parental SES Gradients of Health of Older Adults

		Hypertension		Cholesterol (>=240)		HDL (<40)	
		MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
Death	Father	0.0277	0.0187	0.00514	0.0221	-0.00724	-0.0337
		(0.0413)	(0.0376)	(0.0254)	(0.0335)	(0.0375)	(0.0362)
	Mother	**0.0554****	**0.0526****	-0.00315	-0.00820	0.0381	-0.0276
		(0.0273)	(0.0248)	(0.0180)	(0.0212)	(0.0254)	(0.0246)
GHS	Father	0.0189	-0.00576	0.0160	-0.0187	0.0111	-0.0213
		(0.0249)	(0.0234)	(0.0159)	(0.0195)	(0.0243)	(0.0224)
	Mother	-0.0123	0.0110	0.00477	0.00549	**-0.0558****	0.0236
		(0.0247)	(0.0226)	(0.0147)	(0.0203)	(0.0228)	(0.0217)
ADL	Father	-0.00627	0.00864	0.00428	0.0108	-0.00567	**0.0618****
		(0.0287)	(0.0231)	(0.0185)	(0.0214)	(0.0306)	(0.0253)
	Mother	-0.00119	-0.00539	-0.00552	-0.00900	0.0189	**-0.0649*****
		(0.0277)	(0.0239)	(0.0171)	(0.0221)	(0.0301)	(0.0240)
Father's Education	at least some primary	-0.0518	0.00581	-0.0176	-0.0169	0.0228	-0.00662
		(0.0381)	(0.0377)	(0.0225)	(0.0318)	(0.0368)	(0.0396)
	completed primary	0.0304	-0.0251	**0.0311***	**0.0712*****	-0.0330	**-0.0535****
		(0.0297)	(0.0261)	(0.0188)	(0.0235)	(0.0278)	(0.0261)
	completed junior high school	0.0448	-0.0204	0.0334	0.0602	0.0197	-0.0344
		(0.0486)	(0.0502)	(0.0330)	(0.0406)	(0.0489)	(0.0488)
Mother's Education	at least some primary	-0.0519	0.0366	**0.0467***	**-0.0742****	-0.0263	0.0662
		(0.0424)	(0.0408)	(0.0275)	(0.0293)	(0.0433)	(0.0434)
	completed primary	0.0310	-0.00383	0.00871	-0.0387	0.0247	-0.00629
		(0.0323)	(0.0325)	(0.0205)	(0.0290)	(0.0313)	(0.0299)
	completed junior high school	0.0811	0.00417	0.0109	0.0618	0.0898	-0.0670
		(0.0670)	(0.0667)	(0.0527)	(0.0625)	(0.0688)	(0.0703)
Respondent's age	60 - 65	**0.0736****	**0.0741*****	**-0.0316****	0.0175	-0.0308	**-0.0466****
		(0.0288)	(0.0254)	(0.0158)	(0.0213)	(0.0263)	(0.0235)
	65 - 70	**0.114*****	**0.131*****	**-0.0452*****	-0.0113	**-0.0538****	0.0279
		(0.0294)	(0.0249)	(0.0163)	(0.0208)	(0.0268)	(0.0258)
	70 - 75	**0.168*****	**0.214*****	-0.00662	-0.0148	**-0.0946*****	-0.0121
		(0.0331)	(0.0304)	(0.0207)	(0.0253)	(0.0318)	(0.0275)
	75 - 80	**0.188*****	**0.189*****	-0.0401	-0.0130	-0.0227	-0.0510
		(0.0396)	(0.0320)	(0.0248)	(0.0302)	(0.0423)	(0.0362)
	80 -	**0.200*****	**0.262*****	**-0.0637*****	-0.0115	-0.0154	-0.0283
		(0.0408)	(0.0312)	(0.0236)	(0.0309)	(0.0425)	(0.0356)
Constant		**0.520*****	**0.545*****	0.0835	**0.221****	**0.686*****	**0.507*****
		(0.107)	(0.0920)	(0.0537)	(0.105)	(0.0860)	(0.0883)
R-squared		0.082	0.091	0.098	0.113	0.084	0.107

Sample size	2985	3493	2957	3457	2931	3445
Birth Place (kabupatan) dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
F-test (p-values)						
Age dummy variables	0.0000	0.0000	0.0166	0.8531	0.0755	0.1147
Parent's education dummy variables	0.0028	0.8191	0.1043	0.0003	0.3484	0.0912
Parent's death dummy variables	0.0754	0.0734	0.9711	0.7573	0.3258	0.2694
Parent's GHS dummy variables	0.7473	0.8871	0.3886	0.6163	0.0379	0.4911
Parent's ADL dummy variables	0.9544	0.9324	0.9480	0.8701	0.7985	0.0136
Parent's health (death, GHS, ADL) dummy variables	0.4435	0.3594	0.8811	0.9638	0.3055	0.1140
Parent's health (death, GHS, ADL) + Edu dummy vars	0.0055	0.6558	0.3038	0.0032	0.3392	0.0416
Birth Place dummy variables (kabupatan level)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: IFLS4 Note: Standard errors in parenthesis. (clustered at community level) *** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, GHS and ADL but not reported in the table.

Table 1_d. Parental SES Gradients of Health of Older Adults

		Cognition		Depression	
		MEN	WOMEN	MEN	WOMEN
Death	Father	-0.121	**-0.306****	-0.0453	0.277
		(0.132)	(0.138)	(0.277)	(0.298)
	Mother	-0.129	-0.0391	0.145	0.265
		(0.0840)	(0.0837)	(0.179)	(0.197)
GHS	Father	-0.0360	-0.0374	**0.311****	0.108
		(0.0830)	(0.0819)	(0.153)	(0.159)
	Mother	-0.0751	-0.0649	**0.288***	**0.561*****
		(0.0826)	(0.0781)	(0.150)	(0.171)
ADL	Father	-0.0444	-0.00114	0.0734	0.294
		(0.0959)	(0.0955)	(0.197)	(0.200)
	Mother	-0.0234	**0.168****	0.256	-0.264
		(0.0907)	(0.0818)	(0.183)	(0.183)
Father's Education	at least some primary	**0.493*****	**0.408*****	-0.0775	-0.421
		(0.138)	(0.132)	(0.243)	(0.266)
	completed primary	0.159	**0.547*****	**-0.470*****	**-0.451****
		(0.0967)	(0.0924)	(0.160)	(0.186)
	completed junior high school	**0.457*****	**1.275*****	0.0654	**-1.103*****
		(0.162)	(0.166)	(0.313)	(0.331)
Mother's Education	at least some primary	-0.123	0.135	**-0.617****	0.0462
		(0.146)	(0.147)	(0.277)	(0.337)
	completed primary	**0.347*****	**0.189***	**-0.357****	-0.296
		(0.107)	(0.100)	(0.177)	(0.225)
	completed junior high school	0.282	0.249	-0.365	-0.228
		(0.215)	(0.212)	(0.435)	(0.500)
Respondent's age	60 - 65	**-0.392*****	**-0.292*****	-0.163	-0.256
		(0.0948)	(0.0898)	(0.153)	(0.163)
	65 - 70	**-0.539*****	**-0.581*****	**0.317***	0.143
		(0.0942)	(0.0904)	(0.183)	(0.190)
	70 - 75	**-0.822*****	**-0.698*****	**0.424****	0.213
		(0.116)	(0.126)	(0.209)	(0.227)
	75 - 80	**-1.158*****	**-1.015*****	**0.932*****	**0.515***
		(0.150)	(0.166)	(0.301)	(0.288)
	80 -	**-1.465*****	**-1.330*****	**1.510*****	**1.282*****
		(0.166)	(0.231)	(0.365)	(0.341)
Constant		**4.740*****	**4.141*****	**3.275*****	**3.121*****
		(0.223)	(0.257)	(0.462)	(0.664)
R-squared		0.203	0.253	0.110	0.107

Sample size	2317	2309	2830	3222
Birth Place (kabupatan) dummy variables	Yes	Yes	Yes	Yes
F-test (p-values)				
Age dummy variables	0.0000	0.0000	0.0000	0.0001
Parent's education dummy variables	0.0000	0.0000	0.0000	0.0000
Parent's death dummy variables	0.1149	0.0582	0.7180	0.1891
Parent's GHS dummy variables	0.4152	0.4741	0.0004	0.0003
Parent's ADL dummy variables	0.7763	0.0654	0.1619	0.2417
Parent's health (death, GHS, ADL) dummy variables	0.1166	0.0627	0.0000	0.0002
Parent's health (death, GHS, ADL) + Edu dummy vars	0.0000	0.0000	0.0000	0.0000
Birth Place dummy variables (kabupatan level)	0.0000	0.0000	0.0000	0.0000

Source: IFLS4 Note: Standard errors in parenthesis. (clustered at community level) *** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, GHS and ADL but not reported in the table.

Table 2_a. Parental SES Gradients of Change in Health of Older Adults

		GHS 2007-1993		ADL 2007-1993		BMI 2007-1993	
		MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
Death	Father	-0.00945	0.0191	-0.0634	**0.278***	0.0845	0.0187
		(0.0441)	(0.0427)	(0.143)	(0.159)	(0.238)	(0.330)
	Mother	0.000374	**0.0532***	-0.0508	-0.0268	-0.0706	-0.341
		(0.0289)	(0.0289)	(0.0917)	(0.118)	(0.175)	(0.229)
GHS	Father	0.00394	**0.0485***	-0.00947	0.0996	0.0819	0.00611
		(0.0265)	(0.0265)	(0.0968)	(0.104)	(0.149)	(0.191)
	Mother	**0.0470***	0.00552	**0.212****	0.177	-0.213	-0.0874
		(0.0270)	(0.0304)	(0.0986)	(0.116)	(0.157)	(0.178)
A D L	Father	0.0436	0.0311	0.108	0.158	0.107	-0.0957
		(0.0337)	(0.0297)	(0.111)	(0.116)	(0.170)	(0.202)
	Mother	-0.00628	-0.0245	-0.145	-0.0601	0.0269	-0.0372
		(0.0321)	(0.0287)	(0.116)	(0.117)	(0.186)	(0.229)
Father's Education	at least some primary	-0.0245	-0.0232	-0.172	-0.154	0.136	**0.661***
		(0.0432)	(0.0459)	(0.161)	(0.162)	(0.261)	(0.338)
	completed primary	-0.0466	**0.0680****	**-0.165***	**0.260****	**0.632*****	0.230
		(0.0314)	(0.0336)	(0.0989)	(0.125)	(0.207)	(0.212)
	completed junior high school	-0.0155	-0.00840	-0.128	**0.345***	0.0150	**1.340***
		(0.0491)	(0.0565)	(0.180)	(0.188)	(0.297)	(0.739)
Mother's Education	at least some primary	0.00966	-0.00138	0.0296	0.0584	-0.0166	-0.135
		(0.0490)	(0.0437)	(0.168)	(0.179)	(0.241)	(0.310)
	completed primary	-0.00735	-0.0507	0.145	-0.141	-0.121	0.262
		(0.0323)	(0.0381)	(0.105)	(0.126)	(0.227)	(0.298)
	completed junior high school	**-0.113***	-0.0299	0.142	**-0.423***	0.138	**-1.351***
		(0.0666)	(0.0794)	(0.350)	(0.226)	(0.439)	(0.796)
Respondent's age	45 - 50	-0.00340	0.0151	**0.254*****	**0.379*****	**-0.648*****	**-0.436****
		(0.0272)	(0.0285)	(0.0962)	(0.122)	(0.177)	(0.219)
	50 - 55	**0.0933*****	0.00666	**0.712*****	**0.726*****	**-0.847*****	**-0.903*****
		(0.0317)	(0.0317)	(0.128)	(0.118)	(0.189)	(0.204)
	55 - 60	**0.123*****	0.0437	**1.115*****	**1.012*****	**-1.437*****	**-0.734*****
		(0.0376)	(0.0362)	(0.162)	(0.171)	(0.240)	(0.260)
	60 - 65	**0.146*****	-0.0204	**1.395*****	**1.825*****	**-0.906*****	**-1.553*****
		(0.0453)	(0.0394)	(0.195)	(0.200)	(0.222)	(0.227)
	65 -	**0.108****	0.0567	**2.159*****	**1.936*****	**-1.152*****	**-1.749*****
		(0.0532)	(0.0518)	(0.213)	(0.241)	(0.239)	(0.289)
Constant		**0.293****	**0.372*****	**1.082***	0.128	**1.188****	**2.020*****
		(0.123)	(0.100)	(0.550)	(0.295)	(0.533)	(0.739)
R-squared		0.085	0.066	0.207	0.154	0.104	0.110
Sample size		2388	2828	2380	2820	2188	2698
Birth Place (kabupatan) dummy variables		Yes	Yes	Yes	Yes	Yes	Yes

F-test (p-values)						
Age dummy variables	0.0001	0.6512	0.0000	0.0000	0.0000	0.0000
Parent's education dummy variables	0.2199	0.3018	0.7286	0.1184	0.0398	0.0737
Parent's death dummy variables	0.9757	0.1292	0.7805	0.2119	0.8704	0.3291
Parent's GHS dummy variables	0.0841	0.0837	0.0634	0.0603	0.4008	0.8773
Parent's ADL dummy variables	0.3205	0.5229	0.4262	0.3985	0.7323	0.8069
Parent's health (death, GHS, ADL) dummy variables	0.0811	0.0601	0.4129	0.0235	0.6692	0.5914
Parent's health + education dummy variables	0.0858	0.1081	0.6494	0.0173	0.0820	0.1248
Birth Place dummy variables (kabupatan level)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: IFLS1, IFLS2, IFLS4

Note: Standard errors in parenthesis (clustered at community level). *** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, GHS and ADL but not reported in the table.

Table 2_b. Parental SES Gradients of Change in Health of Older Adults

		Hemoglobin 2007-1997		Hypertension 2007-1997	
		MEN	WOMEN	MEN	WOMEN
Death	Father	0.267	-0.220	-0.0761	0.00659
		(0.215)	(0.167)	(0.0524)	(0.0466)
	Mother	-0.136	0.0769	**0.0543***	**0.0542***
		(0.123)	(0.103)	(0.0328)	(0.0299)
GHS	Father	0.131	0.0526	0.0137	**-0.0500***
		(0.106)	(0.0923)	(0.0318)	(0.0281)
	Mother	0.123	-0.0164	-0.0223	**0.0467***
		(0.107)	(0.0912)	(0.0286)	(0.0271)
A D L	Father	**-0.223***	0.122	-0.00141	0.0443
		(0.129)	(0.117)	(0.0358)	(0.0298)
	Mother	0.105	-0.0566	-0.0151	-0.0258
		(0.124)	(0.111)	(0.0362)	(0.0306)
Father's Education	at least some primary	0.136	**-0.338****	-0.0537	-0.000736
		(0.143)	(0.150)	(0.0460)	(0.0430)
	completed primary	0.00311	-0.0408	-0.00314	**-0.0674****
		(0.131)	(0.109)	(0.0358)	(0.0298)
	completed junior high school	-0.256	0.0217	0.0768	-0.00759
		(0.225)	(0.173)	(0.0612)	(0.0572)
Mother's Education	at least some primary	0.0816	0.235	0.00263	-0.0305
		(0.177)	(0.175)	(0.0466)	(0.0482)
	completed primary	-0.00129	-0.151	-0.0223	0.00897
		(0.151)	(0.129)	(0.0404)	(0.0365)
	completed junior high school	**0.582***	-0.0826	-0.00561	0.0810
		(0.331)	(0.339)	(0.0946)	(0.0827)
Respondent's age	45 - 50	-0.175	0.0480	**0.0694****	-0.0271
		(0.125)	(0.109)	(0.0314)	(0.0297)
	50 - 55	-0.0437	**-0.364*****	**0.0760****	**-0.0850*****
		(0.136)	(0.121)	(0.0377)	(0.0315)
	55 - 60	**-0.225***	**-0.520*****	**0.0689***	**-0.0618***
		(0.135)	(0.125)	(0.0417)	(0.0322)
	60 - 65	-0.248	**-0.343****	0.0498	-0.0526
		(0.160)	(0.134)	(0.0414)	(0.0388)
	65 -	-0.182	**-0.616*****	**0.0864****	**-0.102*****
		(0.177)	(0.130)	(0.0401)	(0.0372)
Constant		-0.00188	**1.609*****	**0.354****	**0.212*****
		(0.355)	(0.343)	(0.139)	(0.0753)
R-squared		0.081	0.105	0.072	0.050

Sample size	2305	2842	2340	2894
Birth Place (kabupatan) dummy variables	Yes	Yes	Yes	Yes
F-test (p-values)				
Age dummy variables	0.4139	0.0000	0.1606	0.0327
Parent's education dummy variables	0.4866	0.2132	0.5797	0.1501
Parent's death dummy variables	0.3131	0.3990	0.1413	0.1915
Parent's GHS dummy variables	0.0809	0.8484	0.7381	0.1208
Parent's ADL dummy variables	0.2202	0.5763	0.8658	0.3330
Parent's health (death, GHS, ADL) dummy variables	0.1610	0.7674	0.6047	0.0911
Parent's health + education dummy variables	0.3707	0.5716	0.6545	0.0604
Birth Place dummy variables (kabupatan level)	0.0000	0.0000	0.0000	0.0000

Source: IFLS1, IFLS2, IFLS4
Note: Standard errors in parenthesis (clustered at community level). *** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, GHS and ADL but not reported in the table.

Table 3_a. Parental SES Gradients of Health of Older Adults: Interactions with Birth Region

		Poor GHS		# ADL problems		# IADL problems	
		MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
Death	Father	-0.00959	0.0597	-0.235	**0.526***	0.0174	**0.222**
		(0.0606)	(0.0604)	(0.236)	(0.194)	(0.132)	(0.105)
	Father * java	0.00761	-0.0768	0.304	**-0.421***	0.0495	-0.136
		(0.0687)	(0.0693)	(0.254)	(0.229)	(0.147)	(0.125)
	Mother	0.0186	0.0529	0.139	-0.00322	-0.0510	0.0489
		(0.0373)	(0.0400)	(0.122)	(0.166)	(0.0739)	(0.0871)
	Mother * java	-0.0367	0.0263	-0.138	0.124	0.0335	0.0419
		(0.0428)	(0.0471)	(0.143)	(0.187)	(0.0898)	(0.100)
GHS	Father	0.0523	0.0402	**0.284**	0.110	0.0899	-0.0374
		(0.0380)	(0.0400)	(0.128)	(0.166)	(0.0858)	(0.0962)
	Father * java	-0.0266	0.0283	-0.178	-0.0522	0.0317	0.0641
		(0.0439)	(0.0451)	(0.160)	(0.190)	(0.102)	(0.109)
	Mother	0.0600	0.0402	**0.450***	**0.301**	**0.312***	**0.210**
		(0.0370)	(0.0385)	(0.144)	(0.139)	(0.0887)	(0.0812)
	Mother * java	-0.00766	-0.0422	**-0.447**	-0.248	**-0.283***	-0.161
		(0.0440)	(0.0467)	(0.175)	(0.174)	(0.105)	(0.0993)
ADL	Father	**0.0868**	**0.0747**	0.0270	0.0869	0.0653	0.110
		(0.0375)	(0.0376)	(0.143)	(0.151)	(0.0865)	(0.0937)
	Father * java	**-0.0968**	**-0.118***	0.00107	0.198	-0.0673	-0.0358
		(0.0480)	(0.0455)	(0.181)	(0.186)	(0.111)	(0.115)
	Mother	-0.0209	-0.0172	-0.0146	-0.172	-0.112	-0.00906
		(0.0361)	(0.0387)	(0.151)	(0.162)	(0.0794)	(0.0920)
	Mother * java	0.0151	0.00856	0.0610	0.115	0.168	-0.0400
		(0.0465)	(0.0471)	(0.185)	(0.196)	(0.104)	(0.112)
Father's Education	at least some primary	0.0451	-0.0295	-0.00503	-0.0153	-0.160	-0.0568
		(0.0562)	(0.0569)	(0.213)	(0.242)	(0.112)	(0.145)
	completed primary	0.0687	0.0402	-0.0717	**0.347**	-0.124	0.156
		(0.0461)	(0.0380)	(0.170)	(0.172)	(0.104)	(0.102)
	completed junior high school	0.0410	-0.0193	-0.104	**0.644***	-0.173	0.121
		(0.0586)	(0.0929)	(0.216)	(0.337)	(0.144)	(0.175)
	at least some primary * java	-0.0941	-0.00156	-0.199	-0.140	-0.0664	-0.0579
		(0.0661)	(0.0658)	(0.244)	(0.271)	(0.128)	(0.163)
	completed primary * java	**-0.111**	-0.0436	-0.101	-0.250	-0.113	**-0.281**
		(0.0508)	(0.0432)	(0.185)	(0.196)	(0.116)	(0.115)
	completed Jr. H school * java	-0.0642	-0.00900	-0.0578	-0.602	-0.0748	**-0.330***
		(0.0753)	(0.104)	(0.285)	(0.378)	(0.182)	(0.199)
Mother's Education	at least some primary	**-0.140**	0.0333	**-0.364***	0.239	-0.156	-0.0440

		(0.0664)	(0.0696)	(0.220)	(0.243)	(0.127)	(0.118)
	completed primary	**-0.104****	-0.0631	**-0.308***	-0.225	-0.0744	-0.167
		(0.0481)	(0.0436)	(0.170)	(0.183)	(0.106)	(0.112)
	completed junior high school	**-0.222*****	-0.0405	-0.278	**-0.941****	**-0.230***	**-0.459****
		(0.0794)	(0.103)	(0.242)	(0.369)	(0.130)	(0.199)
	at least some primary * java	**0.179****	-0.0221	**0.584****	-0.374	**0.304***	-0.0312
		(0.0774)	(0.0802)	(0.269)	(0.283)	(0.155)	(0.143)
	completed primary * java	0.0791	0.0543	**0.465****	0.102	0.190	0.158
		(0.0542)	(0.0542)	(0.191)	(0.221)	(0.121)	(0.133)
	completed Jr. H school * java	0.153	-0.00927	0.586	0.581	**0.593****	0.366
		(0.0966)	(0.126)	(0.429)	(0.450)	(0.254)	(0.239)
Respondent's age	60 - 65	**0.0501****	0.0121	**0.347*****	**0.605*****	**0.179*****	**0.402*****
		(0.0223)	(0.0208)	(0.0896)	(0.0827)	(0.0550)	(0.0485)
	65 - 70	**0.123*****	**0.0617*****	**0.875*****	**1.091*****	**0.532*****	**0.669*****
		(0.0253)	(0.0228)	(0.102)	(0.0942)	(0.0635)	(0.0566)
	70 - 75	**0.190*****	**0.104*****	**1.380*****	**1.642*****	**0.901*****	**1.099*****
		(0.0279)	(0.0286)	(0.139)	(0.123)	(0.0887)	(0.0769)
	75 - 80	**0.189*****	**0.114*****	**1.476*****	**2.495*****	**1.125*****	**1.684*****
		(0.0343)	(0.0345)	(0.173)	(0.180)	(0.114)	(0.104)
	80 -	**0.219*****	**0.163*****	**2.866*****	**3.213*****	**1.631*****	**2.033*****
		(0.0386)	(0.0342)	(0.205)	(0.174)	(0.131)	(0.0913)
Constant		**0.294*****	**0.450*****	0.600	**0.617****	0.290	0.0399
		(0.103)	(0.0826)	(0.395)	(0.286)	(0.189)	(0.110)
R-squared		0.133	0.095	0.298	0.304	0.294	0.346
Sample size		3081	3608	3080	3605	3081	3605
Birth Place (kabupatan) dummy variables		Yes	Yes	Yes	Yes	Yes	Yes
F-test (p-values)							
Age dummy variables		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parents' Edu dummy variables * java		0.0953	0.9394	0.0616	0.3308	0.1248	0.2551
Parents' Edu dum + parents' Edu dum * java		0.0269	0.8766	0.0667	0.1283	0.0003	0.0258
Parents' death dummy variables * java		0.6893	0.5179	0.3265	0.1704	0.8893	0.5452
Parents' death dum + Parents' death dum * java		0.9124	0.0157	0.5891	0.0359	0.7556	0.0361
Parents' GHS dummy variables * java		0.7080	0.6548	0.0050	0.1913	0.0254	0.2599
Parents' GHS dum + Parents' GHS dum * java		0.0004	0.0017	0.0002	0.0453	0.0002	0.0560
Parents' ADL dummy variables * java		0.0894	0.0149	0.9331	0.2983	0.2682	0.8360
Parents' ADL dum + Parents' ADL dum * java		0.1919	0.0685	0.9662	0.0675	0.5211	0.4963
Parents' death, GHS, ADL dum * java		0.2135	0.0840	0.0100	0.1638	0.2091	0.5871
Parents' health + Parents' death, GHS, ADL * java		0.0007	0.0000	0.0002	0.0004	0.0007	0.0076
Parents' death, GHS, ADL + education dum * java		0.0557	0.4028	0.0044	0.2348	0.1037	0.4298
Birth place (kabupatan) dummy variables		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: IFLS4

Note: Standard errors in parenthesis (clustered at community level).
*** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, father/mother's GHS and father/mother's ADL but not reported in the table.

Table 3_b. Parental SES Gradients of Health of Older Adults: Interactions with Birth Region

		BMI (< 18.5)		BMI (>= 25)		HB (M <13, W <12)	
		MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
Death	Father	-0.0385	0.0374	0.0648	0.00955	0.0606	-0.0636
		(0.0563)	(0.0438)	(0.0498)	(0.0732)	(0.0540)	(0.0689)
	Father * java	0.0479	0.0205	-0.0270	-0.0281	-0.0827	0.0995
		(0.0650)	(0.0499)	(0.0653)	(0.0846)	(0.0684)	(0.0787)
	Mother	**0.0718****	0.0402	-0.0277	**-0.114*****	**0.0692****	0.0637
		(0.0317)	(0.0302)	(0.0387)	(0.0428)	(0.0339)	(0.0390)
	Mother * java	-0.0383	-0.0112	-0.0161	0.0699	0.00111	-0.0727
		(0.0383)	(0.0355)	(0.0466)	(0.0518)	(0.0418)	(0.0451)
GHS	Father	-0.00378	**-0.0486***	-0.000989	0.0260	0.00864	0.00111
		(0.0344)	(0.0280)	(0.0353)	(0.0359)	(0.0340)	(0.0372)
	Father * java	0.00306	0.0538	-0.00189	-0.00807	-0.0415	0.0200
		(0.0412)	(0.0333)	(0.0411)	(0.0425)	(0.0420)	(0.0451)
	Mother	0.0157	**0.0621****	-0.00845	-0.00884	-0.0415	-0.0400
		(0.0379)	(0.0266)	(0.0380)	(0.0350)	(0.0377)	(0.0366)
	Mother * java	-0.0146	**-0.0811****	-0.00232	-0.0249	0.0500	0.0109
		(0.0442)	(0.0324)	(0.0434)	(0.0441)	(0.0450)	(0.0447)
ADL	Father	0.0129	0.0375	**-0.0803****	**-0.0912****	**0.00652**	**-0.0841****
		(0.0411)	(0.0296)	(0.0337)	(0.0390)	(0.0429)	(0.0350)
	Father * java	-0.0315	-0.0277	**0.0763***	**0.0850***	0.0214	0.0726
		(0.0495)	(0.0377)	(0.0430)	(0.0472)	(0.0522)	(0.0464)
	Mother	-0.0295	**-0.0540***	0.0336	**0.0724***	0.0219	**0.0830****
		(0.0331)	(0.0293)	(0.0339)	(0.0389)	(0.0409)	(0.0394)
	Mother * java	0.0613	0.0550	-0.0388	-0.0422	-0.0613	-0.0542
		(0.0423)	(0.0358)	(0.0450)	(0.0506)	(0.0500)	(0.0489)
Father's Education	at least some primary	0.0567	**0.0887***	0.0197	-0.0237	-0.00366	-0.0544
		(0.0483)	(0.0505)	(0.0501)	(0.0634)	(0.0521)	(0.0650)
	completed primary	0.0358	-0.0205	0.0502	**0.101****	0.00130	-0.00821
		(0.0416)	(0.0334)	(0.0386)	(0.0445)	(0.0452)	(0.0461)
	completed junior high school	-0.0140	**-0.104*****	0.0190	**0.278*****	0.00293	-0.105
		(0.0528)	(0.0350)	(0.0594)	(0.0759)	(0.0627)	(0.0773)
	at least some primary * java	**-0.111****	**-0.125****	0.0165	0.104	-0.0783	0.0332
		(0.0563)	(0.0621)	(0.0601)	(0.0752)	(0.0655)	(0.0757)
	completed primary * java	-0.0720	-0.00582	0.0138	0.00233	-0.0543	-0.0341
		(0.0466)	(0.0392)	(0.0466)	(0.0522)	(0.0535)	(0.0534)
	completed Jr. H school * java	-0.0504	0.0194	0.0768	-0.127	-0.0689	0.0363
		(0.0672)	(0.0460)	(0.0814)	(0.0915)	(0.0830)	(0.0944)
Mother's Education	at least some primary	**-0.0915***	-0.0624	-0.0295	0.105	**0.118***	0.00460

		(0.0507)	(0.0514)	(0.0577)	(0.0734)	(0.0711)	(0.0643)
	completed primary	**-0.138*** **	-0.0489	**0.0925** **	0.0435	-0.0544	0.0269
		(0.0404)	(0.0336)	(0.0442)	(0.0556)	(0.0493)	(0.0450)
	completed junior high school	-0.0837	-0.0249	0.0700	0.0325	-0.0497	0.00167
		(0.0654)	(0.0553)	(0.109)	(0.120)	(0.0830)	(0.102)
	at least some primary * java	0.0557	0.0683	0.0270	-0.0679	-0.00976	0.0451
		(0.0589)	(0.0614)	(0.0705)	(0.0891)	(0.0836)	(0.0772)
	completed primary * java	**0.117** **	0.0161	-0.0306	-0.0777	0.0700	-0.0461
		(0.0492)	(0.0399)	(0.0547)	(0.0658)	(0.0604)	(0.0588)
	completed Jr. H school * java	0.0125	0.0898	0.159	-0.154	0.0186	-0.00509
		(0.0826)	(0.0766)	(0.138)	(0.139)	(0.112)	(0.126)
Respondent's age	60 - 65	0.0326	**0.0320***	-0.0279	**-0.0493** **	0.0385	0.0415
		(0.0224)	(0.0183)	(0.0220)	(0.0229)	(0.0237)	(0.0253)
	65 - 70	**0.0788*** **	**0.130*** **	**-0.0634*** **	**-0.101*** **	**0.115*** **	**0.0903*** **
		(0.0232)	(0.0218)	(0.0195)	(0.0239)	(0.0265)	(0.0249)
	70 - 75	**0.157*** **	**0.165*** **	**-0.103*** **	**-0.152*** **	**0.213*** **	**0.121*** **
		(0.0321)	(0.0265)	(0.0220)	(0.0249)	(0.0321)	(0.0304)
	75 - 80	**0.205*** **	**0.146*** **	**-0.0685** **	**-0.142*** **	**0.210*** **	**0.186*** **
		(0.0411)	(0.0313)	(0.0281)	(0.0291)	(0.0445)	(0.0377)
	80 -	**0.204*** **	**0.207*** **	**-0.114*** **	**-0.210*** **	**0.289*** **	**0.269*** **
		(0.0432)	(0.0370)	(0.0247)	(0.0285)	(0.0405)	(0.0387)
Constant		0.0548	-0.0271	**0.323*** **	**0.674*** **	**0.234*** **	**0.362*** **
		(0.0592)	(0.0382)	(0.112)	(0.0798)	(0.0836)	(0.0866)
R-squared		0.111	0.113	0.092	0.132	0.128	0.099
Sample size		2974	3482	2974	3482	2979	3474
Birth Place (kabupatan) dummy variables		Yes	Yes	Yes	Yes	Yes	Yes
F-test (p-values)							
Age dummy variables		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parents' Edu dummy variables * java		0.1215	0.2495	0.5372	0.0581	0.7007	0.6684
Parents' Edu dum + parents' Edu dum * java		0.0003	0.0001	0.0000	0.0000	0.2886	0.6435
Parents' death dummy variables * java		0.4563	0.8946	0.8071	0.4030	0.4786	0.1507
Parents' death dum + Parents' death dum * java		0.0660	0.0159	0.3407	0.0608	0.0215	0.3757
Parents' GHS dummy variables * java		0.9424	0.0274	0.9943	0.7120	0.4810	0.7923
Parents' GHS dum + Parents' GHS dum * java		0.9959	0.0822	0.9771	0.7379	0.5436	0.6197
Parents' ADL dummy variables * java		0.3507	0.3056	0.2016	0.1986	0.4598	0.2674
Parents' ADL dum + Parents' ADL dum * java		0.6874	0.4224	0.1953	0.1070	0.6777	0.0799
Parents' death, GHS, ADL dum * java		0.6926	0.2041	0.6558	0.4568	0.6456	0.2746
Parents' health + Parents' death, GHS, ADL * java		0.3002	0.0367	0.4459	0.0862	0.1432	0.2700
Parents' death, GHS, ADL + education dum * java		0.3512	0.2328	0.6690	0.1144	0.8310	0.5703
Birth place (kabupatan) dummy variables		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: IFLS4

Note: Standard errors in parenthesis (clustered at community level).

*** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, father/mother's GHS and father/mother's ADL but not reported in the table.

Table 3_c. Parental SES Gradients of Health of Older Adults: Interactions with Birth Region

		Hypertension		Cholesterol (>=240)		HDL (<40)	
		MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
Death	Father	0.0134	-0.0498	**0.0644***	0.0137	0.0323	**-0.126***
		(0.0698)	(0.0728)	(0.0338)	(0.0541)	(0.0574)	(0.0709)
	Father * java	0.0250	0.0932	**-0.0847***	0.0143	-0.0580	0.125
		(0.0824)	(0.0839)	(0.0463)	(0.0667)	(0.0763)	(0.0827)
	Mother	**0.105****	0.0604	-0.0384	0.0106	0.0383	-0.0109
		(0.0468)	(0.0439)	(0.0295)	(0.0348)	(0.0466)	(0.0502)
	Mother * java	-0.0692	-0.0103	0.0493	-0.0294	0.000411	-0.0217
		(0.0562)	(0.0521)	(0.0358)	(0.0418)	(0.0553)	(0.0566)
GHS	Father	0.0318	-0.00139	0.00602	0.0143	-0.0152	-0.0596
		(0.0414)	(0.0469)	(0.0258)	(0.0325)	(0.0402)	(0.0425)
	Father * java	-0.0146	-0.00606	0.0150	-0.0472	0.0344	0.0572
		(0.0504)	(0.0520)	(0.0324)	(0.0384)	(0.0492)	(0.0493)
	Mother	0.0121	-0.00645	-0.0203	-0.0318	0.00633	0.0242
		(0.0424)	(0.0411)	(0.0265)	(0.0316)	(0.0389)	(0.0401)
	Mother * java	-0.0368	0.0249	0.0342	0.0552	**-0.0861***	0.00131
		(0.0509)	(0.0493)	(0.0324)	(0.0398)	(0.0468)	(0.0467)
ADL	Father	-0.0301	0.0155	-0.00125	-0.00693	-0.0201	**0.0992****
		(0.0459)	(0.0422)	(0.0241)	(0.0331)	(0.0475)	(0.0435)
	Father * java	0.0353	-0.00915	0.00475	0.0258	0.0288	-0.0575
		(0.0582)	(0.0505)	(0.0349)	(0.0431)	(0.0609)	(0.0524)
	Mother	-0.0256	-0.0264	-0.00754	0.00250	-0.00470	-0.0609
		(0.0462)	(0.0397)	(0.0237)	(0.0370)	(0.0416)	(0.0418)
	Mother * java	0.0360	0.0292	0.00540	-0.0177	0.0286	-0.00623
		(0.0576)	(0.0498)	(0.0334)	(0.0452)	(0.0574)	(0.0508)
Father's Education	at least some primary	**-0.119***	0.0734	**-0.0725****	-0.0311	0.00844	**-0.129****
		(0.0705)	(0.0649)	(0.0287)	(0.0498)	(0.0561)	(0.0628)
	completed primary	0.0229	-0.0105	0.0166	0.0601	-0.0391	**-0.119*****
		(0.0521)	(0.0421)	(0.0283)	(0.0366)	(0.0445)	(0.0431)
	completed junior high school	0.0397	-0.0612	0.0460	0.0697	-0.0876	-0.0760
		(0.0731)	(0.0895)	(0.0505)	(0.0647)	(0.0794)	(0.0886)
	at least some primary * java	0.101	-0.0979	**0.0809****	0.0210	0.0208	**0.181****
		(0.0825)	(0.0780)	(0.0400)	(0.0625)	(0.0709)	(0.0761)
	completed primary * java	0.0120	-0.0213	0.0164	0.0203	0.0112	**0.0972***
		(0.0628)	(0.0515)	(0.0361)	(0.0452)	(0.0540)	(0.0510)
	completed Jr. H school * java	0.00211	0.0600	-0.0310	-0.0160	**0.184***	0.0585
		(0.0965)	(0.104)	(0.0665)	(0.0821)	(0.0981)	(0.107)

Mother's Education	at least some primary	-0.0724	0.0850	0.0197	-0.0679	-0.0620	**0.174****
		(0.0782)	(0.0678)	(0.0436)	(0.0431)	(0.0738)	(0.0730)
	completed primary	0.0258	-0.0312	0.00646	0.0228	0.0254	0.0209
		(0.0506)	(0.0520)	(0.0323)	(0.0442)	(0.0544)	(0.0478)
	completed junior high school	-0.0720	0.000485	-0.0224	0.0151	**0.255*****	-0.0139
		(0.115)	(0.116)	(0.0762)	(0.0873)	(0.0902)	(0.116)
	at least some primary * java	0.0243	-0.0705	0.0362	-0.00809	0.0430	**-0.161***
		(0.0931)	(0.0834)	(0.0558)	(0.0571)	(0.0908)	(0.0888)
	completed primary * java	0.00637	0.0427	0.00579	**-0.0969***	-0.00580	-0.0440
		(0.0654)	(0.0654)	(0.0408)	(0.0544)	(0.0658)	(0.0590)
	completed Jr. H school * java	0.225	0.0166	0.0537	0.0823	**-0.259****	-0.0802
		(0.140)	(0.140)	(0.106)	(0.120)	(0.124)	(0.144)
Respondent's age	60 - 65	**0.0754*****	**0.0740*****	**-0.0303***	0.0190	-0.0302	**-0.0476****
		(0.0288)	(0.0256)	(0.0157)	(0.0212)	(0.0263)	(0.0236)
	65 - 70	**0.115*****	**0.131*****	**-0.0454*****	-0.0112	**-0.0522***	0.0274
		(0.0296)	(0.0250)	(0.0165)	(0.0209)	(0.0267)	(0.0258)
	70 - 75	**0.168*****	**0.215*****	-0.00712	-0.0149	**-0.0930*****	-0.0118
		(0.0332)	(0.0307)	(0.0207)	(0.0254)	(0.0316)	(0.0278)
	75 - 80	**0.191*****	**0.189*****	-0.0393	-0.0117	-0.0209	-0.0516
		(0.0397)	(0.0320)	(0.0246)	(0.0303)	(0.0422)	(0.0362)
	80 -	**0.201*****	**0.261*****	**-0.0645*****	-0.0117	-0.0170	-0.0284
		(0.0407)	(0.0314)	(0.0235)	(0.0310)	(0.0424)	(0.0357)
Constant		**0.519*****	**0.511*****	0.0880	**0.225****	**0.694*****	**0.472*****
		(0.110)	(0.0936)	(0.0590)	(0.108)	(0.0917)	(0.0911)
R-squared		0.085	0.093	0.102	0.115	0.087	0.111
Sample size		2985	3493	2957	3457	2931	3445
Birth Place (kabupatan) dummy variables		Yes	Yes	Yes	Yes	Yes	Yes
F-test (p-values)							
Age dummy variables		0.0000	0.0000	0.0174	0.8289	0.0826	0.1111
Parents' Edu dummy variables * java		0.5054	0.5384	0.1974	0.4583	0.4332	0.1815
Parents' Edu dum + parents' Edu dum * java		0.0150	0.7333	0.0271	0.0014	0.1236	0.0469
Parents' death dummy variables * java		0.4683	0.5392	0.1312	0.7729	0.7459	0.3175
Parents' death dum + Parents' death dum * java		0.1160	0.1257	0.3227	0.8842	0.6231	0.2927
Parents' GHS dummy variables * java		0.5911	0.8607	0.2503	0.3284	0.1813	0.3999
Parents' GHS dum + Parents' GHS dum * java		0.7797	0.9720	0.4050	0.5397	0.0583	0.5443
Parents' ADL dummy variables * java		0.4430	0.8206	0.9519	0.8346	0.5237	0.3652
Parents' ADL dum + Parents' ADL dum * java		0.7903	0.9664	0.9966	0.9669	0.8515	0.0365
Parents' death, GHS, ADL dum * java		0.6069	0.8610	0.2272	0.8757	0.4280	0.5226
Parents' health + Parents' death, GHS, ADL * java		0.5066	0.5931	0.5586	0.9866	0.4213	0.1897
Parents' death, GHS, ADL + education dum * java		0.4825	0.7925	0.2061	0.7778	0.3549	0.1669
Birth place (kabupatan) dummy variables		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: IFLS4
Note: Standard errors in parenthesis (clustered at community level).
*** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, father/mother's GHS and father/mother's ADL but not reported in the table.

Table 3_d. Parental SES Gradients of Health of Older Adults: Interactions with Birth Region

		Cognition		Depression	
		MEN	WOMEN	MEN	WOMEN
Death	Father	-0.0485	-0.197	0.196	0.589
		(0.227)	(0.259)	(0.414)	(0.659)
	Father * java	-0.0653	-0.187	-0.324	-0.392
		(0.277)	(0.296)	(0.550)	(0.740)
	Mother	-0.158	-0.0352	0.253	0.462
		(0.135)	(0.150)	(0.336)	(0.426)
	Mother * java	0.0175	0.0105	-0.138	-0.274
		(0.163)	(0.177)	(0.388)	(0.466)
GHS	Father	-0.0996	-0.134	0.517	0.229
		(0.133)	(0.142)	(0.333)	(0.335)
	Father * java	0.0841	0.166	-0.279	-0.192
		(0.167)	(0.170)	(0.369)	(0.377)
	Mother	**-0.224***	0.128	0.287	**0.776****
		(0.124)	(0.135)	(0.319)	(0.332)
	Mother * java	0.235	**-0.306***	-0.0143	-0.313
		(0.161)	(0.162)	(0.357)	(0.384)
ADL	Father	-0.0655	0.189	-0.157	0.445
		(0.141)	(0.175)	(0.353)	(0.409)
	Father * java	0.0463	-0.299	0.353	-0.250
		(0.190)	(0.207)	(0.419)	(0.463)
	Mother	0.205	0.109	0.281	-0.475
		(0.137)	(0.136)	(0.323)	(0.379)
	Mother * java	**-0.398****	0.0902	-0.0550	0.354
		(0.181)	(0.168)	(0.386)	(0.422)
Father's Education	at least some primary	**0.459***	**0.445***	-0.187	-0.428
		(0.249)	(0.238)	(0.396)	(0.478)
	completed primary	0.0850	**0.564*****	**-0.661****	**-0.640****
		(0.163)	(0.143)	(0.332)	(0.320)
	completed junior high school	0.294	**1.150*****	-0.110	**-1.347****
		(0.229)	(0.309)	(0.486)	(0.614)
	at least some primary * java	0.0411	-0.0655	0.153	-0.00427
		(0.288)	(0.279)	(0.501)	(0.557)
	completed primary * java	0.0952	-0.0434	0.274	0.263
		(0.192)	(0.176)	(0.379)	(0.380)
	completed junior high school * java	0.224	0.180	0.268	0.290
		(0.313)	(0.358)	(0.649)	(0.732)

Mother's Education	at least some primary	**-0.615****	0.313	**-0.867***	-0.219
		(0.269)	(0.261)	(0.448)	(0.478)
	completed primary	**0.535*****	0.0871	-0.125	-0.261
		(0.162)	(0.141)	(0.314)	(0.419)
	completed junior high school	0.370	**0.976*****	-0.293	**-1.597****
		(0.426)	(0.347)	(0.852)	(0.684)
	at least some primary * java	**0.748****	-0.265	0.348	0.402
		(0.308)	(0.316)	(0.550)	(0.640)
	completed primary * java	-0.278	0.184	-0.338	-0.0448
		(0.199)	(0.198)	(0.380)	(0.493)
	completed junior high school * java	-0.170	**-1.163*****	-0.119	**2.273****
		(0.494)	(0.435)	(0.995)	(0.907)
Respondent's age	60 - 65	**-0.385*****	**-0.299*****	-0.167	-0.247
		(0.0940)	(0.0896)	(0.154)	(0.164)
	65 - 70	**-0.542*****	**-0.578*****	**0.325***	0.138
		(0.0948)	(0.0915)	(0.183)	(0.188)
	70 - 75	**-0.836*****	**-0.695*****	**0.418****	0.202
		(0.117)	(0.127)	(0.212)	(0.228)
	75 - 80	**-1.161*****	**-1.016*****	**0.946*****	**0.517***
		(0.148)	(0.167)	(0.301)	(0.290)
	80 -	**-1.494*****	**-1.333*****	**1.505*****	**1.281*****
		(0.165)	(0.230)	(0.365)	(0.339)
Constant		**4.744*****	**4.287*****	**3.396*****	**3.140*****
		(0.245)	(0.267)	(0.528)	(0.671)
R-squared		0.211	0.260	0.111	0.111
Sample size		2317	2309	2830	3222
Birth Place (kabupatan) dummy variables		Yes	Yes	Yes	Yes
F-test (p-values)					
Age dummy variables		0.0000	0.0000	0.0000	0.0001
Parents' Edu dummy variables * java		0.0214	0.0540	0.9552	0.1099
Parents' Edu dum + parents' Edu dum * java		0.0000	0.0000	0.0013	0.0000
Parents' death dummy variables * java		0.9718	0.8129	0.7385	0.6631
Parents' death dum + Parents' death dum * java		0.3285	0.1399	0.8387	0.3994
Parents' GHS dummy variables * java		0.1534	0.1691	0.6508	0.3926
Parents' GHS dum + Parents' GHS dum * java		0.2235	0.2669	0.0032	0.0014
Parents' ADL dummy variables * java		0.0584	0.3480	0.6549	0.6995
Parents' ADL dum + Parents' ADL dum * java		0.1869	0.1204	0.3896	0.6088
Parents' death, GHS, ADL dum * java		0.2250	0.4759	0.8870	0.6929
Parents' health + Parents' death, GHS, ADL * java		0.0731	0.0778	0.0011	0.0027
Parents' death, GHS, ADL + education dum * java		0.0193	0.0863	0.9837	0.1700

Birth place (kabupatan) dummy variables	0.0000	0.0000	0.0000	0.0000

Source: IFLS4

Note: Standard errors in parenthesis (clustered at community level).

*** significant at 1%, ** significant at 5%, * significant at 10% . Dummy variables capturing missing observations are included in the regression for each of the following variables: father/mother's education, father/mother's GHS and father/mother's ADL but not reported in the table.

Table A1. Means and Standard Deviations of Variables

Variables	Description	MEN Obs	MEN Mean	MEN SD.	MEN Min	MEN Max	WOMEN Obs	WOMEN Mean	WOMEN SD.	WOMEN Min	WOMEN Max
Poor GHS	Somewhat unhealthy or very unhealthy = 1	3081	0.23	0.42	0	1	3608	0.29	0.45	0	1
# of ADLs difficulties	The sum of the number of difficulties of ADLs	3080	1.04	1.89	0	9	3605	1.79	2.17	0	9
# of IADLs difficulties	The sum of the number of difficulties of IADLs	3081	0.55	1.19	0	5	3605	1.01	1.32	0	5
BMI	Underweight: < 18.5	2974	0.20	0.40	0	1	3482	0.20	0.40	0	1
	Overweight: >= 25	2974	0.17	0.38	0	1	3482	0.30	0.46	0	1
Hemoglobin	Men: less than 13, Women: less than 12	2979	0.30	0.46	0	1	3474	0.35	0.48	0	1
Hypertension	Systolic >=140 or diastolic >=90 or doctor diagnosis	2985	0.52	0.50	0	1	3493	0.63	0.48	0	1
Cholesterol	Total cholesterol >= 240	2957	0.11	0.31	0	1	3457	0.23	0.42	0	1
HDL	HDL < 40	2931	0.65	0.48	0	1	3445	0.39	0.49	0	1
Cognition	The mean of correctly immediate and delayed recalled words	2317	3.56	1.58	0	9	2309	3.22	1.57	0	10
Depression	Short CES-D score	2830	3.90	3.17	0	26	3222	4.56	3.59	0	27
Father's death	Being dead in 2007	3081	0.94	0.23	0	1	3608	0.95	0.23	0	1
Mother's death	Being dead in 2007	3081	0.81	0.39	0	1	3608	0.84	0.37	0	1
Father's poor GHS	Somewhat unhealthy or very unhealthy now or before death = 1	3081	0.50	0.50	0	1	3608	0.47	0.50	0	1
Mother's poor GHS	Somewhat unhealthy or very unhealthy now or before death = 1	3081	0.47	0.50	0	1	3608	0.45	0.50	0	1
Father's ADL problem	Need help with basic personal needs now or before death = 1	3081	0.23	0.42	0	1	3608	0.24	0.42	0	1
Mother's ADL problem	Need help with basic personal needs now or before death = 1	3081	0.25	0.43	0	1	3608	0.26	0.44	0	1
Java dummy variable	Born in Jakarta, Java, Yogyakarta or Bali (developed areas) = 1	3081	0.69	0.46	0	1	3608	0.68	0.47	0	1
Father's education	At least some primary school	3081	0.09	0.29	0	1	3608	0.06	0.24	0	1
	Completed primary school	3081	0.24	0.43	0	1	3608	0.23	0.42	0	1
	Completed junior high school	3081	0.06	0.24	0	1	3608	0.05	0.22	0	1
Mother's education	At least some primary school	3081	0.07	0.25	0	1	3608	0.05	0.23	0	1
	Completed primary school	3081	0.17	0.38	0	1	3608	0.15	0.35	0	1
	Completed junior high school	3081	0.02	0.15	0	1	3608	0.02	0.15	0	1
Respondent's age	50-59	3081	0.49	0.50	0	1	3608	0.46	0.50	0	1
	60-65	3081	0.15	0.36	0	1	3608	0.15	0.36	0	1
	65-70	3081	0.14	0.35	0	1	3608	0.15	0.36	0	1
	70-75	3081	0.10	0.30	0	1	3608	0.10	0.30	0	1
	75-80	3081	0.06	0.23	0	1	3608	0.07	0.25	0	1
	80-	3081	0.06	0.24	0	1	3608	0.06	0.25	0	1
Respondent's height		3081	158.40	9.83	16	189	3608	146.70	10.57	14	198
Respondent's Edu	At least some primary school	3081	0.29	0.45	0	1	3608	0.29	0.46	0	1
	Completed primary school	3081	0.29	0.45	0	1	3608	0.19	0.39	0	1
	Completed junior high school	3081	0.09	0.29	0	1	3608	0.06	0.24	0	1
	Completed senior high school	3081	0.17	0.38	0	1	3608	0.08	0.28	0	1

Source: IFLS4

Table A2. The distribution of Father\Mother's Death and GHS

1. Father death\GHS

Father

Death\GHS	very healthy	somewhat healthy	somewhat unhealthy	unhealthy	missing	
Alive	8 (2.18%)	251 (68.39%)	85 (23.16%)	10 (2.72%)	13 (3.54%)	367
Dead	100 (1.58%)	2395 (37.88%)	2409 (38.11%)	733 (11.59%)	685 (10.84%)	6322
Total	108 (1.61%)	2646 (39.56%)	2494 (37.29%)	743 (11.11%)	698 (10.44%)	6689

Source: IFLS4

2. Mother death\GHS

Mother

Death\GHS	very healthy	somewhat healthy	somewhat unhealthy	unhealthy	missing	
Alive	25 (2.15%)	835 (71.74%)	237 (20.36%)	43 (3.69%)	24 (2.06%)	1164
Dead	63 (1.14%)	2172 (39.31%)	2133 (38.60%)	640 (11.58%)	517 (9.36%)	5525
Total	88 (1.32%)	3007 (44.95%)	2370 (35.43%)	683 (10.21%)	541 (8.09%)	6689

Source: IFLS4