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The Effects of Health Insurance of Adolescents on Their Future Well-being

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THE EFFECTS OF HEALTH INSURANCE OF ADOLESCENTS ON THEIR FUTURE WELL-BEING

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The number of uninsured children in the United States has declined since the late 1990s. According to the National Health Interview Survey, the percentage of children who were uninsured at the time of the survey decreased from 13.9% in 1997 to 7.0% in 2011. Nevertheless, 5.3 million children lacked health insurance coverage in 2011. Among uninsured children, adolescents tend to be uninsured at higher rates than younger children.

The effects of health insurance coverage on children have been widely studied in economics and health care policy literature. Findings have indicated positive correlations between health insurance coverage and children's health care access, health outcomes, educational performance, and quality of life. Few studies have focused on the effects of health insurance in adolescence, a transitional period marked by rapid physical and intellectual growth. For adolescents, lack of health insurance could decrease current well-being and cause negative effects in adulthood. Therefore, it is crucial to study the effects of health insurance coverage for adolescents, which as the results of this study show, can provide insight into the implications for future well-being as adults.

In this study, I estimate the effects of health insurance coverage for adolescents on future well-being—including health status, educational attainment, and labor market

performance. These three achievement outcomes are treated as response variables in the econometric models built for this study, while health insurance coverage of adolescents is the main explanatory variable in the models. To estimate the econometric models for measuring the effects of health insurance coverage for adolescents, I use a longitudinal survey data set (Add Health), which includes a cohort of adolescents from the 1994–1995 school year who were again studied in young adulthood through follow-up surveys in 2001–2002 and 2007–2008. One of the benefits of using the Add Health survey data in the analysis is that they combine longitudinal data on adolescents' health insurance, social economic status, parental characteristics, and future well-being. Therefore, the Add Health survey data provide plentiful information on the control variables in the models and help to identify the causal effects of health insurance coverage for adolescents after controlling for these variables.

In estimating the econometric models, I first apply ordinary least square (OLS) regression. I also use ordered logistic regression and then compare the results with those of the OLS. Consistent results between the two estimations indicates that after controlling for parental, adolescent, and young adult characteristics, adolescents who are covered by health insurance have significantly higher educational attainment and personal earnings in young adulthood than adolescents who are not covered.

To test the consistency of least squares estimates in case there is any endogeneity in the developed econometric models, I use the Durbin–Wu–Hausman test (augmented regression test). Based on the results of the test, I reject the hypothesis that the potential endogeneity problem could be ignored in the models. In addition, I use bivariate probit analysis to test for endogeneity. The results imply that the residual was correlated with

health insurance coverage of adolescents and health outcome, which could lead to selection bias.

To control for bias in the models, I use the two-stage least squares (TSLS) method. In the first stage of the TSLS method, I construct an instrumental variable and use it to predict health insurance coverage. In the second stage, I estimate the models with achievement outcomes as dependent variables and predict health insurance coverage and control variables as independent variables. The main results of the TSLS analysis suggest positive correlations between health insurance and future outcomes for adolescents, which have sign consistent with the OLS and ordered logistic estimates. Having health insurance could lead to the increase of future education attainment by 14.4% (OLS) and by 140.9% (TSLS). Adolescents who have health insurance tend to have $1648 more (OLS) or $17044 more (TSLS) personal earnings than those who do not have. I also conduct propensity score matching (PSM). Overall, the empirical analysis results suggest the importance of having health insurance for adolescents, which enables them to improve their education and socioeconomic status in young adulthood.

To my loving parents,

Guoqing Zhou and Qingzhu Wu

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Table of Contents

List of Tables

Chapter 1

Introduction

One major social problem in the U.S. in recent years is that a large number of American adolescents lack health insurance. Newacheck, et al. (2004) report that the estimated percentage of uninsured American adolescents was 12% in 2002. In another study, Institute of Medicine (IOM, 2009) report that approximately one in nine adolescents aged 10–18 lacked insurance coverage in 2006.

When looking at these uninsured numbers more closely, it is seen that there are large disparities in health care coverage for children and adolescents across different income, age and ethnic groups. For example, according to the Kaiser Commission (2007), the uninsured percentage among all children (77.9 million) in the U.S. in 2005 was 12%, while among low-income children (33.2 million) the uninsured percentage was 20%. Among ethnic groups, 15% of low-income white adolescents were uninsured, 16% of low-income African Americans were uninsured, 24% of low-income Asian Americans were uninsured, and 25% of low-income Hispanic Americans were uninsured. Between the ages of 6 through 18, the uninsured percentage for low-income adolescents averages about 20% between 6 and 17, and then rises dramatically to about 34% for the age of 18.

Health insurance is integral to adolescents' well-being. According to the Kaiser Commission on Medicaid and the Uninsured (2007), uninsured children are six times more likely than insured children to lack a usual provider of medical care. Other research demonstrates that uninsured children are more likely to experience worse

health outcomes than children with coverage (Zhang, et al., 2009). The educational achievement of uninsured children could also suffer because they miss more days of school, which may affect their ability to reach their full potential (Byck, 2000).

Although a robust body of research provides compelling findings about the benefits of gaining health insurance for children on their well-being, there are no longitudinal studies that identify children without health insurance and track their future well-being into young adulthood. One major challenge is the lack of longitudinal data that combine information about children's health insurance, family background and social environments with their future achievement outcomes when they become young adults. It is difficult to build and estimate econometric models on the future effects of health insurance without such longitudinal data sets.

Another common problem of previous studies is that the majority of studies do not rigorously control for possible selection bias when estimating the effects of health insurance of children on various economic and developmental outcomes. There are many variables that could affect the future development of children. Due to the lack of contextual data on the family background and social environment of children, many studies fail to find effective ways of controlling for potential endogeneity (i.e., correlation between the observed and unobserved variables) caused by the unobserved characteristics of adolescents and parents, which will lead to biased estimates in these studies.

The main focus of this thesis is on measuring how health insurance coverage of adolescents affects their future well-being in young adulthood. Adolescence is defined here as the time period between the ages of 10 and 19, which is consistent with the World

Health Organization's definition of adolescence. Young adulthood is defined here as the time period between the ages of 20 and 40. This study uses multiple waves of the Add Health Survey data, a longitudinal study of a nationally representative sample of adolescents and young adults. Ages of children in wave I of the Survey range between 11 and 19. This cohort has been followed into young adulthood with four subsequent in-home interviews. There are five types of health insurance of adolescents identified in the survey data: Medicaid, Medicare, individual or group private coverage, prepaid health plan, and other types of health insurance.

This thesis builds econometric models to estimate the effects of health insurance of adolescents on their future health status, educational attainment and labor market performance using the survey data. It further analyzes how these effects vary by adolescents' and parents' characteristics like gender and race. Two main contributions of the thesis are: first, the effects of health insurance of adolescents on their future achievements are analyzed based upon newly developed econometric models. To the best of my knowledge, the study is the first one to analyze the effects of health insurance of adolescents on their *future* achievement outcomes. Previous studies only focus on the effect of health insurance of children on their *current* well-being. Adolescence is the transitional stage from childhood to young adulthood. Health in adolescence can immediately affect the educational attainment and labor market outcomes in young adulthood. The thesis thus focuses on this transitional stage and makes the best use of the Add Health Survey data, which combine the longitudinal information on adolescents' health insurance status and well-being with contextual information about their family and neighborhood. The econometric models developed in the thesis provide links between

health insurance of adolescence and their achievement outcomes in young adulthood. The findings of the study underscore the importance of expanding health insurance coverage of adolescents.

The second contribution of this thesis is the use of varied approaches to test and control for the potential endogeneity caused by unobserved adolescent characteristics. To test the existence of endogeneity in the developed econometric models, the Durbin–Wu–Hausman test (augmented regression test) suggested by Davidson and MacKinnon (1993), is used. Bivariate probit models are also estimated to investigate whether the residual in the econometric model is correlated to both the health insurance of adolescents (an independent variable) and their future achievement (the dependent variables). To control for endogeneity, I first utilize propensity score matching to estimate the effects of health insurance. In addition, I employ the method of two-stage least squares (TSLS). The consistency of the analyses resulting from the aforementioned varied robust methods further confirms the positive causal effects of health insurance of adolescents on their future development.

The remainder of the thesis is organized as follows. Section 2 provides a literature review on the studies of the effects of health insurance of children and adolescents on their current well-being and future outcomes. Section 3 investigates the effect of health insurance of adolescents on their current health status, which could impact their future outcomes. Section 4 develops a series of econometric models with adolescents' future outcomes as dependent variables and their health insurance coverage and other characteristic variables as independent variables. It describes the Add Health data and the treatment of missing values, and presents descriptive statistics of the dependent and

independent variables in the econometric models. The main results are presented in this Section, including ordinary least squares (OLS), ordered logistic regression, bivariate probit analysis, propensity score matching, and TSLS analysis that are used to estimate the econometric models based on data set with single or multiple imputation. It also presents the results of various robustness tests including analyses on data set without imputation, and analyses with parents' health and education as ordinal variables. Finally, section 5 discusses the findings and offers some conclusions.

Chapter 2

Previous Literature

There is a large body of research on the impacts of health insurance of children and adolescents on their *current* health or education outcomes. Some researchers measure the causal effect of health insurance on the achievement outcomes (Byck, 2000; Szilagyi et al., 2001; Damiano et al, 2003; etc.), while others analyze the effects of health insurance on a child's access to health care (Aiken et al., 2004, Mulvihill et al., 2005, Klein et al., 2007), which could further affect their health status and educational attainment. There is also an increasing concern among researchers that the current health of children and adolescents may affect their future well-being (Currie, Madrian, 1999, Case, Fertig, Paxson, 2004, Smith, 2008). Although many of the previous studies indicate that health insurance of adolescents may affect their later life outcomes, there are no studies that quantitatively measure the causal effects.

2.1 Studies of the effect of health insurance of children and adolescents on their current well-being

Prior research in the field of pediatrics and health economics finds significant positive effects of health insurance of children on their current well-being. These studies are primarily based upon the population of children between 0 and 19 years of age. A few of them focus specifically on adolescents. One of the common problems of previous studies is that many of them do not rigorously control for selection bias caused by unobserved parental or children's characteristics.

Szilagyi et al. (2001) access the impact of New York's State Children's Health Insurance Program (SCHIP) on health care for children with asthma. The study is based on information of children who were newly enrolled in the New York SCHIP program in 2001 (n= 2644) and children in the SCHIP program 13 months later (n = 2310). It uses bivariate and multiple analyses to compare outcomes of children at baseline versus follow-up ((year before SCHIP vs. year during SCHIP). Children are found to have far fewer asthma-related attacks in the year after enrollment versus the 12 months prior to enrollment in SCHIP (3.8 vs. 9.5). The results also find that the percentage of children hospitalized for asthma in the previous year declines dramatically (from 11.1% to 3.4%). The comparison of children before and after the enrollment in SCHIP indicates that health insurance improves health of children with asthma.

Lykens and Jargowsky (2002) study whether Medicaid expansions improve the health and functional status of children. They extract data for children under age 15 from the dataset managed by the National Center for Health Statistics (NCHS), Department of Health and Human Service, which in total have 16,266 children in the data set. For the outcome variable, the study uses the number of acute illnesses experienced in the two weeks prior to the survey to measure the child's general health status. Several measures of functional limitations caused by illnesses are also considered in the study: number of days spend in bed due to illness in the previous two weeks; number of days that the child's normal activities were restricted due to illness in the last two weeks; etc.. To control for the endogeneity issue, the study uses Medicaid eligibility as an instrument variable for Medicaid enrollment. Separate econometric models are estimated for the dependent variables using fixed-effects regressions. The control variables include

environmental characteristics, family and socioeconomic characteristics, and private insurance coverage. The models are estimated for each dependent variable at two different levels of aggregation. First, models are estimated using the individual child as the unit of analysis. Second, models are estimated at a aggregated level, using primary sampling units (PSU) mean values of the dependent and independent variables. The study finds that white insured children had statistically significant reductions in acute health conditions and functional limitations. Black and Hispanic children being covered by Medicaid showed some evidence of improved health conditions and functional status.

Damiano et al (2003) investigate the effect of the Iowa Separate State Child Health Insurance Program (S-SCHIP) on child health status. The study uses a longitudinal pretest-posttest panel survey to compare children's access to health care, health status, and family environment at the beginning of the program versus after one year. There are 463 children in the dataset, relatively evenly distributed in age from 1 to 19. Statistical tests are conducted for differences in responses to the baseline and follow-up surveys. For questions with dichotomous response variable (for example, if children has a chronic condition or not), the McNemar tests for correlated proportions are used; for questions with continuous response options (for example, children's overall health), the Wilcoxon signed rank tests are used. The results suggest that the health status of children and the implications of lower health status have been improved significantly after a year's enrollment. The findings also indicate that parents are more likely to report their child in excellent health after a year in the program, and fewer children are reported to require more supervision than other children their age because of a medical or emotional condition.

Some studies also suggest that lack of health insurance for children leads to worse wellbeing. Byck (2000) compares the health status of uninsured children who would be eligible for the State Children's Health Insurance Program (SCHIP) with health of children being covered (Medicaid-enrolled, privately insured, and privately insured). The study is conducted based on data from the 1993 and 1994 National Health Interview Surveys. The data set includes information about health insurance coverage, demographic background and health status of around 50,000 children age 0 to 18 years. The study uses multivariate analyses to estimate the correlation of the health status variables with the lack of health insurance. The study finds that 1) uninsured SCHIP-eligible children are more likely to be adolescents and more likely to be in excellent health than Medicaid-eligible children; 2) Hispanic children are more likely to be SCHIP-eligible children and SCHIP-eligible children are more likely to have fair or poor health.

Todd et al. (2006) study hospitalization-related outcomes for children with public insurance or no health insurance at all, comparing with privately insured children. There has been a trend of decrease in the proportion of children covered by private health insurance in Colorado and the United States while the percentage of public insurance or not being covered has been increasing. The study analyzes hospital data for children younger than 18 years of age in Colorado between 1995 and 2003, and in the United States in 2000. The study uses paired-samples t tests for comparison of mean differences between the hospitalization rates for each year for children in Colorado with private insurance and those with public or no insurance over the years 1995–2003. Comparisons for the US in 2000 are calculated using the $\chi 2$ test. In the analysis, age and ethnicity differences between the two patient populations are controlled for. The results imply that

children with public insurance or no insurance have significantly higher rates of total hospital admissions, as well as admissions for chronic illness, asthma, etc.. As for other health outcome measures, the findings suggest that publicly insured or uninsured children also have higher mortality rates and higher severity of illness. However, the results do not necessarily indicate that public insurance systems are inherently flawed comparing with other types of health insurance. The study combines public and no-insurance in one group. It could because most of the inferior outcomes for the combined group are from the uninsured sub group, which lead to lower health status for children with public or no-insurance. Other studies have found that children who obtain public insurance have more health access and achieve better health than the uninsured children.

A large body of literature also finds the positive impacts of health insurance of children on their health care access, which could, in turn, contribute to better health. Kempe, et al. (2005) access the impacts of the Colorado's Child Health Plan Plus (CHP+), which began enrollment in April 1998. The study uses survey data, which have information of children in the two months after their first enrollment into CHP+ (N=711, September 1999 to January 2000), and one year later (N=480, November 2000 to February 2001). The study uses bivariate analysis and multivariate analysis to estimate the effect of enrollment on quantity and quality of health care access, while controlling for type of previous insurance**,** length of time uninsured before enrollment, race, and age. For bivariate analyses, binary categorical data are analyzed using McNemar's test, and continuous data are analyzed using paired t tests; For multivariate analyses, binary categorical data are analyzed using logistic regression, and continuous outcomes are analyzed using Poisson regression within a Generalized Linear Model. The results find

that 1) families who were newly enrolled into Child Health Plan Plus had dramatic increases in access to all types of care and decreases in unmet medical needs, 2) no increase in utilization of emergency department or hospitalization services, and 3) improved overall quality of care in one year after the enrollment.

Mulvihill, et al. (2005) investigate the impact of SCHIP enrollment on adolescent-provider communication. They use data from the Continuous Enrollment Survey and Adolescent Supplement, which includes a random sample of adolescents (ages 12 – 19) who have been enrolled in Alabama's non-Medicaid SCHIP, ALL Kids, for at least 12 months and renewed their enrollment for a second year (October 1999 through September 2000). The study uses Chi-square analysis to compare the reported adolescent-provider communication before and after the enrollment in ALL Kids for the children. The findings suggest that there are substantial increases after enrollment in SCHIP in the communication between adolescents and their health care providers.

Another example is a study on the impact of New York's State Children's Health Insurance Program (SCHIP) on access and quality of health care (Klein et al., 2007). The research is based on data set which includes adolescents and their parents from a stratified random sample of children who were newly enrolled in New York's SCHIP (N=1118 adolescents and their parents) and one year later (N=970). The health care outcomes include health care access (for example having a usual source of care (USC)), health care use (for example preventive care and other types of visits), and health care quality (for example satisfaction with care). The study uses t tests and F tests to compare baseline (before SCHIP) versus follow-up (during SCHIP). Other than t tests and F tests results, the authors also estimates multivariate logistic regression models for the quantity

or quality of health care as dependent variables, controlling for demographic and socioeconomic measures, including age, gender, race, single-parent household, etc. The results suggest that 1) the proportion of adolescents who have a USC increases during SCHIP as compared to before (69.9% to 87.1%); 2) the proportion of adolescents with unmet health care need decreases (54.3% to 42.1%) and with unmet need for preventive care (53.8% to 40.6%) decreases. More adolescents reported having had a preventive care visit (65.9% to 74.2) after being enrolled.

Similarly, loss of health insurance could result in decreased use of some usual source of care (for example, the office-based physician services), and increase in Emergency Department (ED) visits. Town and Scal (2007) study the impact of losing health insurance on health care utilization, expenditures and health for adolescents with chronic conditions during the transition to adulthood. They use data from panels include 705 adolescents with chronic conditions ages 18 - 19 at the end of the first year of observation. The study uses regression based difference-in-differences to evaluate the impact of losing insurance between the 1st and 2nd years on the number of emergency department (ED) visits, physician (DR) visits and total health care expenditures, by comparing those who lose insurance with those retaining continuous coverage. The results suggest that losing insurance results in a 153% increase in ED visits and a 44% decrease in DR visits without significant change in expenditures.

While previous studies consistently find positive effects of health insurance of children on their health outcomes or health care access, many of them fail to control for a potential endogeneity problem caused by unobserved parental or children's characteristics. The unobserved factors that could affect both health insurance coverage

of children and their health outcomes lead to selection bias when estimating the effects of health insurance. For example, the parent child relationship could impact both children's health insurance coverage and their future outcomes. A few studies in the field of health economics use fixed effects method to address the problem. Hanratty (1996) investigates the impact of Canadian National Insurance on infant health. The study analyzes the variation across provinces in dates of implementation of national health insurance (from 1962 to 1972). Because of the differences of implementation for the province, the study could isolate the impact of national health insurance from uncertain province-specific factors that are constant over time, and from factors that vary over time and are common across provinces. The results indicate the introduction of national health insurance is associated with a 4 percent decline in the infant mortality rate.

Another example is the study of the causal effect of insurance on child mortality conducted by Dow and Schmeer (2003). The study uses county fixed effects models based on county-level statistics and census data. The results indicate that the increase in the percentage of people having insurance was strongly correlated with mortality decreases at the county level, before controlling for other time-varying factors. After controlling for changes in other correlated maternal, household, and community characteristics, the results of fixed effects models indicate that the insurance expansion only account for a small portion of the mortality change.

Instrumental variables (IV) have also been used to control for selection bias in several studies. Currie and Gruber (1996) examine the effect of public insurance for children on their health care utilization and health outcomes by exploiting expansions of the Medicaid program to low-income children. In their study, the fraction of children in

the same state, age, and year who are eligible for Medicaid is used as an instrument for imputed individual eligibility. They find the eligibility for Medicaid was associated with a sizable and significant reduction in child mortality.

In another study on the effects of expanding public health insurance eligibility on the health of older U.S. children, Currie, Deckerc, Lin (2008) use data from the National Health Interview Surveys for 1986 to 2005. They follow a similar instrumental variable approach as in the previous study to control for endogeneity. They also use state fixed effects to capture time-invariant characteristics of the states. Because the study uses a restricted version of the National Health Interview Survey (NHIS) data that includes state identifiers, the authors are able to both match information about state Medicaid rules to the children in the sample, and to control for state fixed effects in the analysis. They find that while eligibility for public health insurance unambiguously improves current utilization of preventive care, it has little effect on current health status. The findings also show some evidence that Medicaid eligibility in early childhood has positive future effects on health. This may indicate that adequate medical care for children puts them on a better health trajectory, resulting in better health at older ages.

Anderson, Dobkin, and Gross (2006) investigate the effect of health insurance coverage on the use of medical services. They use IV to estimate the effects of being uninsured on the utilization of outpatient, emergency department (ED), and inpatient services. The study assumes that teenagers do not gain insurance precisely on their nineteenth birthday. Under that assumption, the regressions using instrumental variable would recover the local average treatment effect. The results indicate that aging out results in an abrupt 5 to 8 percentage reduction in the probability of having health

insurance. The drop in insurance coverage results in substantial large reductions in ED visits.

Health insurance can bring additional benefits for children besides improved health outcomes. For example, educational attainment has been found to be positively associated with the health insurance of children. Levine and Schanzenbach (2009) study the impact of children's public health insurance expansions on educational outcomes, which is measured by 4th and 8th grade reading and math test scores. The study uses information of children from the Current Population Survey, and constructs measures of public health insurance eligibility for each state and birth cohort. The explanatory variable of the regression is the aggregated state/year test score data and the outcome variable is the simulated Medicaid eligibility measures by state in students' state/year of residence. To control for selection bias, the study estimates augmented model with state fixed effects and year fixed effects. This approach represents a differences-in-differences estimator of the impact of public health insurance on educational outcomes. To control for bias caused by time-varying, state-specific factors, the authors also estimate models where the outcome is the difference in scores between the two grades, and the eligibility measures are calculated as the difference in rates between the two birth cohorts. The results indicate that test scores in reading, but not math, increased for those children affected at birth by increased health insurance eligibility.

Yeung, et al. (2010) use state-level data to analyze whether health insurance can reduce school absenteeism. They gather information of children (age 19 or under) on each variable in each state between 1992 and 2003. The data set used for the analysis includes information of attendance rate and its factors prior to program implementation,

and four to five years after implementation took place. The study uses OLS cross-sectional estimation and fixed-effects regression techniques that controls for state and year fixed effects. Results of the cross-sectional regression indicate that the increase in participation rate of health insurance is associated with an increase in average daily attendance rate. The result of fixed effects estimation is consistent with the OLS results.

Another example of the positive impacts of health insurance for children is that health insurance can increase health-related quality of life (HRQOL). Seid et al. (2006) examine the effect of health care access on HRQOL in the California's SCHIP program. The study uses surveys that are taken at enrollment and after one and two years in SCHIP program. A measure of pediatric HRQOL is used as outcome variable, with higher values indicating better HRQOL. The study uses a repeated-measures analysis to account for within subject correlation rather than ordinary least squares regression. The results suggest that improved health care access is associated with higher HRQOL scores, whereas poor access is associated with declining HRQOL.

2.2 Studies on the effects of health status of children on their future well-being in adulthood

Although there are no longitudinal studies on the effects of health insurance of children on their future well-being, a growing body of evidence suggests that children's health status has positive impacts on children's future outcomes through effects on their future health and on the accumulation of other forms of human capital such as education.

For example, previous studies suggest that better health in childhood can lead to higher educational attainment (Grossman, 1975; Perri, 1984; Wolfe, 1985; Wadsworth, 1986), and that the higher educational attainment can have positive effect on adult health and on labor market prospects (Grossman and Kaestner, 1997, Cutler and Lleras-Muney, 2007, Clark and Royer, 2010).

Some studies also examine the causal effects of childhood health on later life health and labor market outcomes. Case, Fertig and Paxson (2004) investigate the future effects of childhood health and economic circumstances on adult health, employment and socioeconomic status, using data from a birth cohort that has been followed from birth into middle age. They find children with poor health have significantly lower educational attainment, poorer health, and lower social status as adults, controlling for parental income, education and social class. The results also indicate health in childhood may have direct effects on health and economic status in middle age. After controlling for education and health in earlier adulthood, they find prenatal and childhood health could be an important determinant of health and economic status at age 42.

Smith (2008) examines the effects of childhood health on adult labor market outcomes. The study uses data that contain subsequent socioeconomic status (SES) measures in a panel originally comprised of children who are now well into adulthood. The analysis controls for family and neighborhood background effects, by including siblings in the panel. The results imply that poor childhood health has a substantial effect on SES outcomes during adulthood like family income, household wealth, individual earnings and labor supply.

Although a robust body of research provides evidence that health insurance for children has positive effects on their current well-being, there are no studies directly examining how health insurance of children can affect their future well-being. In the remainder of this study, I estimate a model of the effects of health insurance of adolescents on their future health, educational attainment, and personal income. Multiple waves of the Add Health data are used. The data include information on adolescent's health insurance, well-being and social environment, and track the future outcomes of the respondents into young adulthood. I conduct robustness tests using instrumental variables and propensity score matching. To estimate the existence of selection bias, the Durbin–Wu–Hausman test (augmented regression test) is used. Bivariate probit analysis is also applied to test for endogeneity, which, to the best of my knowledge, has not been used in previous studies on the effects of health insurance of children.

Chapter 3

The Study of Effects of Health Insurance of Adolescents on Adolescent Health

The main purpose of the study is to estimate the correlations between adolescents' health insurance coverage and adults' education and labor market outcomes. Before analyze the *future* impacts of health insurance coverage, I first investigate the effects of adolescent insurance on their *current* health status in section 3. The purpose of this study is to identify potential mechanisms through which adolescents' insurance could affect adult achievements. Previous studies suggest that children's health and education can have positive effects on adult health and on labor market prospects (Grossman and Kaestner, 1997, Cutler and Lleras-Muney, 2007, Clark and Royer, 2010). Therefore, the study of the correlation between adolescent health insurance coverage and adolescent health could provide implications for the correlation between adolescent health insurance and adult health status, education attainment and personal earnings.

The remainder of Section 3 is organized as follows: Section 3.1 develops econometric models with adolescent health as the dependent variable and health insurance and other characteristics as independent variables. Section 3.2 describes the summary statistics of the data. Section 3.3 presents the main results of the OLS and ordered logistic regression, Hausman test, PSM method, and TSLS method. Section 3.4 displays the results of the sensitivity tests. Section 3.5 discusses the major findings.

3.1 Econometric model

I use OLS regression, ordered logistic regression, and TSLS to estimate the effect of adolescent health on adolescent health. The first estimates are for the following reduced form model using OLS regression:

$$Y_i = \alpha + \gamma_1 HI_i + \gamma_2 X_i + \varepsilon_i, \quad (1)$$

where Y_i refers to health status of adolescent *i*. Y_i is an ordinal variable, with higher values indicating better health. HI_i is adolescent *i*'s health insurance status in the past 12 months, which is a binary variable ($HI_i = 1$ means adolescent *i* is covered by health insurance in the past 12 months, HI_i=0 means adolescent *i* is uncovered before). The reason that using health insurance coverage in the past 12 months instead of the coverage at the time of interview is adolescent health status at the time of interview is more likely affected by their health insurance coverage in the past, instead of the current coverage. X_i is a vector of control variables including adolescent *i*'s gender, race, household income, parents' health, education and employment, Single parent indicator, etc; ε_i is the error term in the model.

The descriptions and summary statistics of the outcome variables and explanatory variables are presented in section 3.2. The main results of OLS regression are displayed in section 3.3.

For comparative purposes, Equation (1) is estimated using ordered logistic regression, where the dependent variable is the cumulative logits of health outcome of

adolescents. The main results of the ordered logistic regression are displayed in section 3.3.

Consistent estimation of Equation (1) is based on the assumption that the demographic variables X_i include all of the variables that may confound the relation between health insurance and the different outcomes. If there are unobserved determinants that could affect both adolescent health insurance and health, the estimation will suffer from selection bias. The Durbin-Wu-Hausman tests may be used to test the consistency of least squares estimates when some explanatory variables may be endogenous (Davidson, MacKinnon, 1993). The Hausman test does not test for the existence of endogeneity in the models; rather it tests for whether the OLS estimates are consistent in such a case that there is endogeneity. As Davidson and MacKinnon (1997) wrote,

> "This version of the DWH test is often interpreted as a test for the exogeneity of those components of X not in the space spanned by W . . . This interpretation is somewhat misleading, since what is being tested is not the exogeneity or endogeneity of some components of X, but rather the effect on the estimates of β of any endogeneity that may be present. The null hypothesis is that the OLS estimates β are consistent, not that every column of X is asymptotically independent of u."

To test whether the endogeity problem can be ignored in Equation (1), I use Durbin-Wu-Hausman tests. To test for the existence of endogeneity, I conduct bivariate probit. The results are detailed later in the section on sensitivity tests.

The DWH tests are based on the two following equations:

$$HI = a_0 + a_1 * HIPRO + a_2 * X_2 + \epsilon_1, \quad (2)$$

$$Y = b_0 + b_1 * HI + b_2 * X_3 + \epsilon_2, \quad (3)$$

where HI is adolescent health insurance coverage in the past 12 months; HIPRO is "the proportion of adolescents who have health insurance in the community in the past 12 months". Information about the communities in which adolescent respondents live is gathered from a variety of sources, such as the US Census, the Centers for Disease Control and Prevention, etc.. There are 96 communities in the dataset. HIPRO is calculated as the percentage of adolescents having health insurance in the community. Therefore, for adolescents in the same community, they have the same value of HIPRO. X_2 is a series of other variables that may affect adolescent health insurance coverage. Y is the adolescent's health status, and X_3 is a series of other variables that may influence adolescent health.

The Hausman tests consist of the following two steps: Step 1: Regress HI on HIPRO, X_2, and X_3; Step 2: Regress Y on HI, X_3 and predicted residual from the first regression. The main results of the DWH tests are presented in section 3.2. The results imply that the endogeneity can not be ignored.

To control for the bias, I use I use propensity score matching (PSM) to estimate the reduced form equation (1). The results of nearest neighbor matching and kernel matching are presented in section 3.4.

I also conduct TSLS analysis to control for the endogeneity. In the first stage, the following selection equation is estimated using OLS regression:

$$\mathrm{HI_i} = \theta_1 \mathrm{Instrument_i} + \theta_2 \mathrm{X_{1i,}} \quad , \quad (4)$$

where HI_i is adolescent i's health insurance coverage in the past 12 months; X_{1i} is a vector of control variables related to health insurance, including adolescent i's gender, race, initial health status, health related habit, parents' education and employment, etc.

$Instrument_i$ is the instrumental variable for adolescent health insurance coverage. As aforementioned, it refers to "the proportion of adolescents being covered by health insurance in the same community in the past 12 months". The hypothesis of using HIPRO as an instrumental variable for adolescent health insurance coverage is that the ratio of having health insurance in the same community is likely to be strongly related to adolescent health insurance coverage for adolescents who live in the community, and it is not necessarily related to the future achievements. The higher the proportion of adolescents being covered in the community in the past 12 months, the higher the probability that adolescent i living in the community has health insurance in the past. The results of the first stage is displayed in section 3.3, which show the strongly positive link between HIPRO and health insurance coverage of adolescents. The fact that the F value in the first stage exceeds 10 also supports the notion that HIPRO is not a weak instrumental variable.

The outcome equation in the second stage is as follows:

$$Y_i = \eta_1 \widehat{HI_\iota} + \eta_2 X_2 + \varepsilon_2, \quad , \quad (5)$$

where Y_i refers to adolescent i's health status, which is an ordinal variable. $\widehat{HI}_i$ is the predicted adolescent health insurance coverage in the past 12 months from the first stage. X_2 is a vector of control variables related to Y.

3.2 Data

3.2.1 Add Health Survey Data

In this Chapter, data from Wave 1 of the Add Health survey are used to estimate the aforementioned econometric models. The Add Health survey is a longitudinal study of a nationally representative sample of adolescents in Grades 7-12 in the United States during the 1994-1995 school year. The cohort of Add Health has been followed into young adulthood through four in-home interviews, the most recent being in 2008. Data have been collected from adolescents, their fellow students, school administrators, parents, siblings, friends, and romantic partners. Several types of interviews and questionnaires were administered based on the samples, including in-school interviews, school administrator questionnaire, in-home interview, Add Health picture vocabulary test, and parent questionnaires. The interviews provide detailed information about respondents' social, economic, psychological, and physical well-being, and contextual information about their social environments.

Wave I of the Add Health Survey includes both in-school and in-home samples of adolescents between the ages of 11 and 19. The in-school sample is the primary sample of the Add Health survey. There are 80 high schools selected as representative of US schools according to region, size, type, and ethnicity. The in-school sample includes

90,118 adolescents in Grades 7-12. Around seventy percent of the originally sampled high schools participated. Each school that declined to participate was replaced by a school within the stratum. The in-school questionnaire was administered to students in the in-school sample between September 1994 and April 1995.

As for in-home sample, it includes the main sample and special over-samples. All students who completed the in-school questionnaire and students who did not complete a questionnaire but were listed on a school roster were eligible for selection into the main in-home sample. Students in each school were stratified by grade and sex, with about 17 students randomly chosen from each stratum. In total, there are approximately 200 adolescents from each school. The core sample has 12,105 adolescents. The ethnic, saturation, disabled, and genetic groups are included in the special oversamples, which are further drawn based on the in-school sample.

Wave II data include follow-up in-home interviews with around 15,000 of adolescents as well as follow-up school administrator interviews, which are conducted in 1996. Only the original respondents who are in Grades 8-12 were surveyed in the second wave.

Wave III, conducted in 2001 and 2002, includes in-home interviews with the original respondents whose current age is 18-26 (24 respondents were 27-28 years old at the time of the interviews). During Wave III, researchers also conduct in-home interviews with respondents' partners.

During Wave IV, the fourth in-home interview is conducted in 2007-2008 with the original Wave I respondents, whose current age is 24-32 (52 respondents were 33-34

years old at the time of interview). Researchers administer a comprehensive personal interview that includes collecting physical measurements and biospecimens, such as blood pressure, pulse, height, weight, body mass index, and so on.

In the study on effect of health insurance of adolescent on their current health, I use Wave I of the Add Health survey data to estimate Equations (1)-(5). The data sample for the empirical analysis is based on an in-home interview (N=20,745) and a parent interview (N=17,670) from Wave I. It contains information for adolescent health status, health insurance coverage, and other information related to their health (like household income, parents' background, among others).

The sample for analysis includes 20745 observations in total. There are missing values for dependent variables and independent variables across the sample. Table 1 shows mean, standard deviation, and number of observations with non missing values of the main variables in the analysis in section 3. For the dependent variable, observations with missing values is around 0.1% (36 observations have missing values for adolescent health status).

There were more missing values for independent variables than for dependent variables, especially with respect to father's background. For example, about 41% values for father's education are missing. One of the important reasons for the large percent of missing values for father's background is that most of the survey questionnaire are filled in by mother. They may know more about information of themselves than information of their spouse; and more importantly, for the respondent in the parent interview who are not married and who are not living in a marriage-like relationship, or those who are

married, but not living with the spouse or living in a marriage-like relationship with someone else, they can legitimately skip answering questions regarding their spouse or partner. Therefore, there is much more missing information for father's background than for other variables.

As we will discuss more details in section 4.1, the large percentage of missing data could be problematic as it may lead to biased estimates if the missing is missing not at random (NMAR). There are several types of missing data. In this Chapter, I use two ways of dealing with the large percentage of missing data of father's background. The first is to impute missing values for father's background and conduct analyses on data set with imputation. The data set with three imputations is used for OLS regressions. The data set with single imputation is used for ordered logistic regressions, TSLS, propensity score matching. The results based on the first approach are presented in section 3.3 (regression results). The second way of coping with the missing values for father's background is to exclude the variables of father's background in the models, and use only mother's background. The results based on the second approach are presented in section 3.4 (the sensitivity tests).

3.2.2 Variables

To measure an adolescent's health status, I use data from the "General Health and Diet" questionnaire in Add Health Waves 1. The outcome is constructed from the answers to the survey question "*In general, how is your health?*" The categories of the answer include "excellent" (1), "very good" (2), "good" (3), "fair" (4), and "poor" (5).

Another two categories ("refused" and "don't know") are considered as missing values. For ease of interpretation, the outcome variable is transformed as "excellent" (5), "very good" (4), "good" (3), "fair" (2), "poor" (1); that is, in the new ranking order the higher the value of the variable, the better the health status of the young adult.

Summary statistics for health status outcome according to different health insurance coverage of adolescents are displayed in Table 2. The mean of health outcome is 3.77 for adolescents without health insurance during the past 12 months, and 3.91 for adolescents with health insurance in the past. In the empirical analysis, the health status variable is treated as continuous in the OLS regression, and as an ordinal variable in the ordered logistical regression.

The key explanatory variable in the empirical analysis is adolescent health insurance status in the past 12 months. Adolescent health insurance coverage is a binary variable. It equals 1 when the adolescent has been covered by health insurance in the past 12 months and never drop the insurance. The variable equals 0 when there has been a time adolescents have no health insurance in the past 12 months. The variable is derived from the parents' answer to the question "In the past 12 months, has there been a time when the respondent's child had no health insurance??" from the parent interview in Wave I. If the answer is "refused" or "don't know", adolescent health insurance coverage is set equal to missing. The variable is set equal to 1 if the answer is 0 (0="no"), and equal to 0 otherwise.

Several characteristics of adolescents and their parents are used as control variables in the empirical analysis. The characteristics of adolescents include gender, age, ethnic

background, their birth weight, and their health-related habits like the frequency of smoking, having enough sleeping or not, etc. These variables are based on information provided in the Add Health Wave 1 in-home interviews. Female adolescent is a dummy variable, which equals 1 for female respondents and 0 for male respondents. Age is a continuous variable, while ethnic background is a series of dummy variables for being White, African American, Hispanic, Asian, and Other. Single parent indicator is a dummy variable, which equals 1 if the adolescent is from Single parent. The control variables also include a series of dummy variables for states. There are 41 states in the sample, each of which is represented by a dummy variable to control for state specific effects.

Parents' characteristics include their health status, educational attainment, and employment status in Wave 1. These variables are based on responses to questions in Wave 1 of the Add Health Survey. Health status is an ordinal variable with values of "excellent" (5), "very good" (4), "good" (3), "fair" (2), "poor" (1). Educational attainment is also ordered, representing different levels of education achievement of parents from "never went to school" (1) to "professional training beyond a 4-year college or university" (10). Parents' education and health are included in the model as a series of dummy variables. For example, there are ten dummy variables for mother's education level, representing if the mother has 8 grade or less, or has more than 8th grade, but did not graduate from high school, to has professional training beyond a 4-year college or university The sensitivity tests also include analyses using parents' health and education as ordinal variable for comparison purposes. Parents' employment statuses are binary

variables, indicating whether or not the parents were employed at the time of taking the interview.

Summary statistics for the control variables are shown in Table 2. The table indicates that, (1) female adolescents tend to have lower ratio of insurance coverage than male adolescents; (2) when adolescents grow up, they tend to drop health insurance; (3) Hispanic, Native and African American adolescents are more likely to be uncovered during adolescence; (4) Non-Hispanic white adolescents are more likely to be covered during adolescence; (5) insured adolescents have a dramatically higher mean value of household income than the uninsured; (6) parents of insured adolescents have better health status, higher educational attainment, and a higher ratio of being employed than those of uninsured adolescents. (7) Adolescents from Single parent are more likely to be uncovered.

3.2.3 Descriptive statistics

The descriptive statistics for outcomes and explanatory variables used in the analysis are presented in Table 1-3. Table 1-2 show the statistics based on the original data set without any treatment of missing values. Table 3 shows the statistics based on data set with multiple imputation.

Table 1 shows mean, standard deviation, and number of observations with non missing values of the main variables. The difference between the treatment (being insured) and control (being uninsured) groups is presented in Table 2. It shows that adolescents who have being covered by health insurance in the past 12 months tend to

have a higher average health outcome. Table 3 shows the descriptive statistics for data sets with single imputation and multiple imputations respectively. The means and signs of the differences in the two tables are close to those in Table 2.

3.3 Regression results

3.3.1 OLS and Ordered Logistic estimates

The first set of results uses linear regression and ordered logistic regression to estimate Equation (1) based on data set with multiple imputation. Control variables include adolescent's characteristics, parents' characteristics, and state dummies. In the OLS regression, the outcome variable is treated as a continuous variable. In the ordered logistical regression, the outcome is treated as an ordinal variable, with higher values reflecting better health.

The OLS and ordered logistic estimates are presented in Tables 4-5. Both results indicate that adolescents who are covered by health insurance during the past 12 months could have better health status level than those who are not covered. The positive impact on health is significant at the 1% level for both the OLS and ordered logistic regressions. The results from OLS regression suggest that having health insurance could increase health status level by 5%. The marginal effect based on ordered logistic regression is displayed in table 5, which indicates that having health insurance has positive and significant effects on the probability of achieving "very good" (0.2%) and "excellent" health status (1.9%).

3.3.2 Hausman Test

The OLS and ordered logistic estimates could be biased due to the potential endogeneity problem caused by unobserved determinants that are correlated with both health insurance and future outcomes. To test the consistency of least squares estimates when some explanatory variables may be endogenous, I use the DWH test. Table 6 displays the results of the test. Column (1) shows the results for the first step of Hausman test. Column (2) shows the results for the second step of Hausman test. The coefficient of HI_{res} as shown in column (2) is statistically significant at the 1% level. It indicates that the null hypothesis (potential endogeneity problem can be ignored in Equation (1)) is rejected.

3.3.3 Propensity Score Matching (PSM)

To control for endogeneity, propensity score matching (PSM) is used to estimate the reduced form equation (1). PSM method was firstly proposed by Rosenbaum and Rubin (1983). They defined the propensity score as the conditional probability of assignment to a treatment given a vector of covariates including the values of all treatment confounders. The method uses a predicted probability (propensity score) of taking the treatment to match each subject in the treatment group to one or more subjects in the control group. The predicted probability is estimated using an observed predictor, that is, explanatory variables related to probability of taking the treatment. For each matched subjects from the treatment and control groups, PSM compares the outcome variables between the two groups.

In implementation, PSM usually includes three steps: the first step generates a propensity score for each subject in the treatment group and the control group; the second step uses the propensity score to match subjects; the final step compares the difference in outcomes between the treatment and control groups. The matching methods, in general, include nearest neighbor matching, kernel and local linear matching. Nearest neighbor matching randomly orders the participants who are in the treatment group and non-participants who are in the control group. Then it selects the first participant and finds the non-participant with closest propensity score. This method is intuitively appealing, but less efficient than kernel or local linear matching. The reason is nearest neighbor matching uses only one matched observation in the control group to estimate the potential outcome for a treated observation.

Kernel or local linear matching method was developed by Heckman, Ichimura, and Todd (1997, 1998). The method opens a window around the propensity score for each participant and matches the participant to all non-participants based on propensity scores in that window. A weighted mean outcome of these non-participants is constructed using kernel weights or local linear weights to approximate the outcome of the participant if he did not take the treatment.

In the analysis of propensity scoring matching, the thesis uses both nearest neighbor matching and kernel matching, and compares if the results from the two matching methods are consistent. The results of PSM are displayed in Tables 7, including the results from the nearest neighbor matching and kernel matching. It indicates that adolescent health insurance coverage is positively related to health. The health status of adolescents in the treated group (having health insurance) is higher than those in the

control group by 0.06 (nearest neighbor matching) or 0.08 (kernel matching). The positive impact is significant at the 5% level according to the nearest neighbor matching and at the 1% level according to kernel matching method.

3.3.4 TSLS

I also use TSLS method to control for the selection bias. In the first stage, I estimate Equation (4) using OLS. The standard error in the estimation is clustered by community to take into account correlations error terms. The control variables in Equation (4) include the adolescents' gender and age, household income, Single parent indicator, each parent's ethnic background, health, education and employment characteristics, and state dummies. The instrumental variable in the equation is the constructed variable HIPRO, that is, "the proportion of adolescents who have being covered by health insurance in the past 12 months in the community".

Table 8-9 show the results of the two stages based on data set with multiple imputation. Adolescents from higher income families are more likely to be covered by health insurance than those from lower income families. When household income increases by $1,000, the probability of an adolescent being covered by health insurance is predicted to increase by 0.07%.

Health insurance status is also affected by the parents' ethnic, health, education and employment background. If the father is Hispanic or Native Indian, an adolescent will be 5% or 6% less likely to be covered by health insurance. The mother's employment and

father's employment are estimated to increase the probability of having health insurance by 2.6% and 0.9% respectively, though the effects of father's employment is not significant. In general, the higher the levels of the parents' education, the more likely the adolescent being covered. The largest effect is for parents who have professional training after a 4-year college or university, where the probability of having health insurance increase by 3.9%. Parents' health could also impact adolescent's health insurance coverage. The healthier the mother is, the higher the probability of the adolescent being covered.

As Table 8 indicates, adolescents from communities with higher HIPRO will have a higher probability of being covered. The estimated effect is significant at the 1% level. The F value of the regression is 871.17, which indicates that the instrument is not weak. HIPRO has a significant and positive correlation with adolescent health insurance status.

In the second stage, I estimate Equation (5) using the predicted health insurance status from the first stage estimation. I apply the OLS regression for the estimation. The results are displayed in Table 9. The coefficient of the health insurance coverage is positive, which is consistent with the OLS and ordered logistic results in Table 4. The difference of results between OLS and TSLS is: 1) the coefficient of health insurance is significant at 1% according to OLS and ordered logistic regression, and significant at 10% according to TSLS; 2). the magnitude of the estimated effect is larger based on TSLS than OLS (0.25 vs. 0.05). The reason behind the differences of results needs further study. One of the potential reasons could be the control of selection bias in TSLS.

With regard to the control variables, some notable findings are: 1) mother's health is positively related to adolescent's health status; 2) male adolescents are healthier than female adolescents; 3) as adolescents get older, they are predicted to be getting healthier as well; 4) depression decreases health outcome of young adults by 16%; 5) Eating vegetables and having enough sleep depressed lead to better health status; 6) Adolescents from Single parent have worse health status.

The major findings of the TSLS results in Table 9 are in general consistent with the OLS estimates in Table 4. Parents' education is positively correlated with adolescent health outcome. Mother's employment has negative correlation with adolescent health. One of the potential reason for the negative sign of mother's employment could be the quantity and quality of time mother spend with children may be lower for mother who is employed. I will compare the coefficient of input variables in Table 4 and Table 9 with the corresponding coefficient in the results of sensitivity tests.

3.4 Sensitivity Tests

The sensitivity tests include two parts: 1) conducting OLS, ordered logistic regression, and TSLS on the original data set without any imputation; 2) conducting the similar analyses on the original data set, excluding father's background from input variables, to determine if the main results are consistent with the previous results in section 3.3.3.

The results are displayed in Table 10 for OLS and Table 11 for ordered logistic. Column (1) in Table 10-11 shows the results of analyses based on the original data set,

including mother's background and father's background; Column (2) shows the results of analyses based on the original data set, but excluding father's background. The effect of adolescent health insurance on health status is positive and insignificant in column (1) in Table 10-11. It indicates that having health insurance could increase adolescent health by 2.5% according to OLS results. In column (2), the coefficient of health insurance coverage is positive and significant at the 5% level for Table 10 and 11, which is close to the previous results as shown in Table 9 in section 3.3.3 (positive and significant at the 10% level). It suggests that having health insurance could increase adolescent health by 5.8%.

Table 12-13 shows the results of TSLS regression based on the original data set without imputation, including mother's background and father's background. Table 12 shows that the instrumental variable is positive and significant in the first step of TSLS. F statistics is 38.45, which indicates the instrumental variable is not weak. Table 13 shows that the effect of adolescent health insurance on health is positive and significant at the 5% level. It indicates that having health insurance could increase adolescent health by 60.4%. The results of TSLS as shown in Table 12-13 are in general consistent with the results based on the data set with imputation in section 3.3.3. Table 14-15 show the results of TSLS regression based on the original data set without imputation, but excluding father's background. As Table 14 shows, the instrumental variable is positive and significant in the first step of TSLS. F statistics is 43.99. Table 15 shows the effect of adolescent health insurance on health is positive and significant at the 1% level. It indicates that having health insurance could increase adolescent health by 41.9%

3.5 Conclusion

The main results in section 3 suggest that adolescent health insurance could have positive and significant effect on adolescent health. Having health insurance could lead to the increase of adolescent health by 5% according to OLS estimates, by 8% according to PSM, and by 25.7% according to TSLS. The findings are consistent with the results of previous studies that find positive effects of health insurance of children on their current health (Byck, 2000; Szilagyi et al., 2001; Damiano et al, 2003; etc.). As previous studies indicate that children's health have positive effects on adult health and on labor market prospects (Case, Fertig and Paxson, 2004; Smith, 2008), the positive correlation between adolescent health insurance coverage and health implies that adolescent health insurance may improve adult health status, education attainment and personal earnings through the positive effect on adolescent health.

Chapter 4

The Study of Effects of Health Insurance of Adolescents on Their Future Outcomes

4.1 Conceptual framework and econometric model

A key assumption of this study is that the health insurance of adolescents is chosen by his/her parents. Parents are assumed to make decisions to maximize a household utility function, subject to a family budget constraint and a series of production functions including achievements production functions of their child (Cameron, 1988). The following child future achievement production functions are posted:

$$Y_{i\,t+1} = [H_i(t), HI_i(t), \mu_i, \varepsilon_i(t)], \tag{6}$$

where $Y_{i\,t+1}$ is a child *i*'s future achievement outcome function or a young adult *i*'s achievement outcome function, $HI_i(t)$ is health insurance status of child i, $H_i(t)$ is a vector of family inputs other than health insurance input for child i, μ_i is the initial endowment of child *i*, $\varepsilon_i(t)$ is a vector of disturbance terms for production shocks.

The empirical analysis estimates the production function (6) by evaluating the effects of health insurance of adolescents on their future achievement outcomes. In the time span covered by this study, adolescents age between 12 and 21 (mean=16), while young adults in the two follow-up waves age between 18 and 27 (mean=21), and between 25 and 34 (mean=29) respectively. Three outcome variables are estimated in three equations respectively. In each equation, the main independent variable is health insurance status of adolescents. Other explanatory variables include demographic and family background characteristics. The thesis uses OLS regression, ordered logistic

regression, and TSLS to estimate the model, and applies propensity score matching to test robustness of the results.

4.1.1 OLS Regression

The first estimates are for the following reduced form model using OLS regression:

$$Y_{it} = \alpha + \gamma_1 HI_i + \gamma_2 X_{it} + \varepsilon_{it}, \quad (7)$$

where Y_{it} refers to achievement outcomes of young adult *i* at time t, including health status, educational attainment, and personal income respectively. Y_{it} could be an ordinal variable (health status, educational attainment), or a continuous variable (personal income), depending on the different outcomes measured in the equations. Equation (7) is estimated in three separate analysis according to three outcomes considered in this study; HI_i is adolescent *i*'s health insurance status, which is a binary variable: $HI_i = 1$ means adolescent *i* is covered by health insurance, HI_i=0 means adolescent *i* is uncovered; X_{it} is a vector of control variables including young adult *i*'s gender, race, household income, parents' health, education and employment, etc; ε_{it} is the error term in the model.

The descriptions and summary statistics of the outcome variables and explanatory variables are presented in sections 4.2 and 4.3. The main results of OLS regression are displayed in section 4.3.

4.1.2 Ordered Logistic Regression

For comparative purpose, equation (7) is also estimated as an ordered logistic model. Ordered logistic regression is an extension of standard binary logistic regression, which is applicable to equations with categorical dependent variables. It is based on the proportional odds assumption that if we estimated a series of binary logistic regressions of category 1 vs. 2, category 2 vs. 3, and so on, the parameters would be identical for each model. For example, suppose that the dependent variable Y takes values 1 (poor health), 2 (fair health) and 3 (good health) and let $P_1 = P_{(Y=1)}$, $P_2 = P_{(Y=2)}$ and $P_3 = P_{(Y=3)}$. The ordered logistic regression estimates the relationship between the cumulative logits of Y and independent variables, assuming linear relationships between logits and explanatory variables:

$$\log\left(\frac{p_1}{1-p_1}\right) = Intercept_1 + b_1 * X_1 + b_2 * X_2 + \cdots + b_k * X_{k,} \quad (8)$$

$$\log\left(\frac{p_1+p_2}{p_3}\right) = Intercept_2 + b_1 * X_1 + b_2 * X_2 + \cdots + b_k * X_k, \quad (9)$$

The ordered logistic model assumes that the parameters are the same. Maximum likelihood estimation is used to obtain estimates of the parameters. If parameter b_i is positive, then the log odds of having poor health is higher for higher values of X_i. In Stata, the ordered logistic regression model is expressed as:

$$\log\left(\frac{\pi_i}{1-\pi_i}\right) = \text{Intercept}_1 + (-b_1 * X_1 - b_2 * X_2 - \cdots - b_k * X_k), \quad (10)$$

where π_i is the probability of Y<=i. Therefore if the coefficient b_i is positive, then the log odds of having poor health is lower for higher values of X_i

Equation (7) is estimated using ordered logistic regression for the health and education outcomes. For personal earnings of young adults, an ordinal variable is constructed based on original continuous. The way of constructing the ordinal variable is detailed in section 4.2. The main results of the ordered logistic regression are displayed in section 4.3.

4.1.3 Endogeneity tests

As aforementioned in section 3, the Durbin-Wu-Hausman tests may be used to test the consistency of least squares estimates when some explanatory variables may be endogenous (Davidson, MacKinnon, 1993). I use DWH to test if endogeniety can be ignored in the models. To test for the existence of endogeneity, I conduct bivariate probit. The results are detailed later in the section 4.3.3.

For bivariate probit analysis, I utilize the mothedology, developed by Altonji, Elder, and Taber (2005) to test whether there is selection bias, that is, whether there are unobserved factors in equation (7) that affect both health insurance status and the various outcome variables. To the best of my knowledge, this is the first time bivariate probit analysis has been used to identify selection bias in the study of the effects of health insurance of children.

The bivariate probit model used in the analysis is as below:

$$HI = 1(X_1'\beta + \mu > 0), \tag{11}$$

$$Y = 1(X_2'\gamma_2 + \gamma_1 HI + \varepsilon > 0), \tag{12}$$

$$\begin{bmatrix} \mu \\ \varepsilon \end{bmatrix} \approx N\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix}\right), \tag{13}$$

where HI is the health insurance status of adolescent i, μ refers to the unobserved factors that determine HI, ε is the unobserved factors that determine outcomes Y. and ρ is the correlation between the error components μ and ε in the equation for HI and Y. If ρ is equal to 0, the bivariate probit model is equal to two single probit models. If not, the estimates of the two single probit models will have selection bias. The bivariate probit model is used to test whether ρ is equal to 0. In the analyses, X_1 and X_2 could include different input variables.

4.1.4 TSLS Estimation

Consistent estimation of the econometric model is based on the assumption that the demographic variables X_{it} include all of the variables that may confound the relation between health insurance and the outcomes; that is, that all the variables which could affect both the outcomes and health insurance are controlled for in equation (7). If there are unobserved determinants that could affect both adolescents' health insurance and their later life well-being, the estimation will suffer from selection bias. For example, the unobserved relationship between the parents and the child may affect both health insurance status of the child and their future well-being. A good parent-child relationship could increase the probability of a child being covered by health insurance. It may also have positive effects on the current and future health status of the child.

Another example of an unobserved determinant of health outcomes is the social and economic situation of the state where the child locates in, which is hard to specify in the model. It may affect the state's child health insurance policy, thus affecting the child's health insurance status, and it can also have potential effects on the child's future health, educational achievement, and income if the child remains in the same state when they grow up. If these unobserved variables are not controlled for in the estimation, the error term of the model will be correlated with the child's health insurance status, which leads to selection bias.

To control for the bias and estimate the causal effect, a two-stage least squares estimation (TSLS) is used. In the first stage, the following selection equation is estimated using OLS regression:

$$HI_i = \theta_1 Instrument_i + \theta_2 X_{1i,} \quad , \qquad (14)$$

where HI_i is the health insurance status of adolescent i, X_{1i} is a vector of control variables related to health insurance, including adolescent i's gender, race, initial health status, parents' education and employment, etc.

$Instrument_i$ is the instrumental variable for adolescent i. The thesis constructs the variable HIPRO as an instrumental variable for health insurance of adolescents. HIPRO refers to "the proportion of adolescents being covered by health insurance in the same community". There are 96 communities in the sample. The communities in which the adolescents live are recognized by community identification numbers in the survey data. The thesis calculates the proportion of adolescents who have health insurance in the same community and uses it to estimate adolescents' health insurance status through equation

(11). This is similar to what Currie and Gruber (1996) used as instrumental variable for individual eligibility in their study: the fraction of children in the same state, age, and year who were eligible for Medicaid. The hypothesis of using HIPRO as an instrumental variable is that the ratio of having health insurance in the same community is likely to be strongly related to the health insurance status of adolescents who live in the community, and is not necessarily related to the future achievements of the adolescents. The higher the proportion of adolescents being covered in the community, the higher the probability that adolescent *i* living in the community will have health insurance. The standard error is clustered by community variable. First stage results suggest the strong positive link between HIPRO and health insurance coverage of adolescents. The fact that the F value in the first stage exceeds 10 also supports the notion that HIPRO is not a weak instrumental variable.

The outcome equation in the second stage is as follows:

$$Y_{it} = \eta_1 \widehat{HI}_\iota + \eta_2 X_2 + \varepsilon_2, \quad , \quad (15)$$

where Y_{it} refers to young adult i's achievement outcomes at time *t*, including health status, educational attainment, and personal income. It could be an ordinal variable (health status, educational attainment), or a continuous variable (personal income), depending on which outcome is being considered in the equations. The outcome variables are all treated as continuous variables in the equation and are estimated by OLS. $\widehat{HI}_\iota$ is the predicted health insurance coverage of adolescents from the first stage, which is based on the regression results of equation (11). X_2 is a vector of control variables related to Y.

4.1.5 Propensity Score Matching

Propensity score matching (PSM) is also used to estimate the effect of health insurance on the different outcomes. PSM method was firstly proposed by Rosenbaum and Rubin (1983). They defined the propensity score as the conditional probability of assignment to a treatment given a vector of covariates including the values of all treatment confounders. The method uses a predicted probability (propensity score) of taking the treatment to match each subject in the treatment group to one or more subjects in the control group. The predicted probability is estimated using an observed predictor, that is, explanatory variables related to probability of taking the treatment. For each matched subjects from the treatment and control groups, PSM compares the outcome variables between the two groups.

There are three steps in the implementation of PSM: the first step creates a propensity score for each subject in the treatment group and the control group; the second step uses the propensity score to match subjects; the final step then compares the difference in outcomes between the treatment and control groups. The matching methods, in general, include nearest neighbor matching, and kernel or local linear matching. Nearest neighbor matching identifies the control individual with the closest propensity score for each individual in the treatment group. This method is less efficient than kernel or local linear matching, since nearest neighbor matching uses only one matched observation in the control group to estimate the potential outcome for a treated observation. Kernel or local linear matching method was developed by Heckman, Ichimura, and Todd (1997, 1998). The method has a window around the propensity score of each treated individual and matches this individual to all controls based on the propensity scores in that window. A

weighted mean outcome of these controls is constructed using kernel weights or local linear weights to approximate the outcome of the treated individual if he did not take the treatment. In the implementation of PSM, I estimate the average treatment effect (ATT), which gives the average treatment effect for those who have health insurance as adolescents in this study.

In the analysis of propensity scoring matching, the thesis uses both nearest neighbor matching and kernel matching, and compares if the results from the two matching methods are consistent.

4.2 Data and variables

4.2.1 Data

The goal of this study is to estimate the effects of adolescent health insurance coverage on their future well-being. Therefore, the empirical analysis requires information from adolescents and from young adults. The data sample for the empirical analysis is based on an in-home interview (N=20,745) and a parent interview (N=17,670) from Wave I, and in-home interviews from Wave III (N=15,197) and Wave IV (N=15,701). The estimation sample excludes respondents who did not participate in all three waves. The result is a balanced panel data set, in which each respondent is observed in each wave. . The data set includes 26,068 observations, or observations of 13,034 respondents in Wave 3 and Wave 4 respectively. The data set contains information on their achievement outcomes (the dependent variables in Equation (7)); data from adolescence including health insurance status, household income, parents' background,

and so on (independent variables in Equation (7)); and current information including ethnicity, gender, age, health habits, and so on (the independent variables in Equation (7)).

4.2.2 Treatment of missing data

The sample for analysis includes 26,068 observations, or 13,034 observations in each of the two waves (Waves 3 and 4). There are missing values for dependent and independent variables across the sample. Table 16 shows the mean, standard deviation, and number of observations with non missing values for the main variables.

Observations with missing values for the dependent variables are around 8% (2 observations have missing values for the health status of young adults, 12 have missing values for education attainment of young adults, and 2086 have missing values for the personal earnings of young adults). Given the small proportion of the sample with missing information for the dependent variables, I exclude the observations with missing dependent variable information from the analysis. The sample for the analysis, therefore, have 26,066 observations related to health outcomes, 26,056 observations related to educational attainment, and 23,982 observations related to personal earnings.

There are more missing values for independent variables than for dependent variables, especially with respect to father's background. For example, about 36% of values for father's education were missing. The reason might have been that the parental respondents to the in-home interview were usually mothers; therefore it might have been difficult for mothers to fill in their spouse's information. Another important reason is that

those who are not married and who are not living in a marriage-like relationship, or those who are married but not living with their spouse, could legitimately skip answering questions regarding their spouse or partner. Therefore, there is much more missing information for father's background than for other categories, as usually the mother filled in the survey questionnaire.

The missing data could lead to biased estimates. There are in general three types of missing data: the first is missing completely at random, or MCAR; the second is missing at random, or MAR; the third missing not at random, or MNAR (Rubin, (1987)). MCAR means that the probability that an observation is missing is not correlated to the value of the variable itself or to the value of any other variables. MAR means the missing information for the variable is related to another variable, but not related to the variable itself. MNAR means missing data are related to the values of the variable and to the values of one or more other variables in the model.

There are several types of treatments for dealing with missing data. We could use listwise deletion, pairwise deletion, single imputation (mean or regression substitution), or using dummy variables to flag missing observations, when there are missing data in the study. Listwise deletion is usually the default analysis for most statistical software, like Stata. When the missing data are MCAR, the estimated parameters are not biased, although the deletion of missing data may cause the loss of statistical power; If the data are missing not at random, the estimates would be biased.

The other methods include single imputation, mean substitution, and regression substitution. Single imputation method is to impute the variables with missing values

once according to other input variables without missing values. It could be used to test whether imputed and observed values for variables differ in their relationship to a dependent variable. Mean substitution has biased standard error, since the mean substitution added to the data has a deviation from the mean of zero, while the sample size is increased. Regression substitution has been considered as one of the best simple solutions to deal with missing data (Lynch, 2003). The problem is regression imputation increases the correlation among items and could also underestimate the standard error of the regression coefficients by underestimating the variance in the imputed variable.

Recent developments in methodologies for dealing with missing data include two techniques: (a) the maximum likelihood approach and (b) multiple imputation strategies. The Expectation Maximization (EM) algorithm can be used to obtain maximum likelihood estimators. According to the EM approach, the parameters are first estimated based on the available data. Then the missing data are estimated based on those parameters. Next the parameters are re-estimated based on the filled-in data. The process continues until the difference between estimates of parameters from one estimation to the next is very small. The EM algorithm provides substantial advantages over traditional approaches because it produces unbiased, or nearly unbiased, estimates of means, variances, and covariances.

According to multiple imputation, the predicted values for dependent variable are added to an error component drawn randomly from the residual distribution (predicted d outcome minus actual outcome). This process is random imputation, which repeats several times, generating multiple data sets with coefficients based on each variable from set to set. Then the parameter estimates are combined across each of these analyses to

provide better estimates. The number of imputed data sets is usually three to five (Schafer, 1997). The advantage of using multiple imputations is that they include uncertainty identified in observed data when imputing values.

The missing values in the data set for this study require treatment. Especially in the case of fathers' background, missing data could lead to biased estimates, as it may not have been MCAR. For example, mothers who are not married or who do not live with a spouse or partner are not required to fill in information for their child's father. These mothers are also more likely to have lower household income and less likely to buy health insurance for their child. Therefore, the missing data of father's background are related to other variables such as household income and health insurance coverage of adolescents. Therefore, the listwise deletion of observations with missing values, such as father's background, could lead to biased estimates.

There are two ways of coping with the large percentage of missing data related to father's background. The first is to exclude variables related to father's background from the models and to use only the mothers' information. In this case, I would conduct the analyses based on the original data set without imputation and include the mothers' information only in the sensitivity tests. The second is to impute the missing values for father's background and conduct analyses on the data set with imputation. In this way, the data set would have more data and the robustness of the results could be tested by comparing the results with those of the analysis of the original data set without imputation.

To address the missing data for the independent variables, I use both single and multiple imputation in the analysis. First, I use imputation for the missing values for all adolescent characteristics. For example, I impute mother's employment through a logistic regression on father's employment, household income of adolescents, mother's ethnic and education background, father's ethnic and education background, and so on. Second, I combine the imputed adolescent characteristics with the young adult characteristics and then use imputation for the missing values of young adult characteristics. The reason that I divide the imputation into two steps is that each respondent in the panel sample has two records (from Waves 3 and 4), and the imputation might assign two different values for the two records for adolescent characteristic variables. The adolescent characteristic variables should remain consistent as static variables for young adults. Therefore, the two-step approach imputes the static variables first and then merges them with the young adult characteristics. In the second step, the static variables have no missing values and are not considered to be imputed, so they are consistent for each respondent's two records.

The methods of imputing the missing values for the young adult characteristic variables include both single and multiple imputation methods. The data sets generated through the two methods are used for different analyses. The imputation process only includes imputation for independent variables. All observations with missing values for the dependent variables are deleted before the imputation.

The data set with three imputations is used for OLS and ordered logistic regressions. The Stata command mim is used to separately analyze each imputed data set and to combine the separate estimates following Rubin's rules (Rubin, 1987) to obtain the final

estimate. The data set with the single imputation is used for TSLS, PSM, and bivariate analyses due to the difficulty of using mim to combine estimates for these analyses. In addition to the analysis of the data set with imputation treatment for missing values, I include an analysis for comparison purposes based on the original data set that do not have any treatment for missing data in the sensitivity test.

4.2.3 Variables

Achievement outcomes

The young adult's achievement outcomes in this study include their health status, educational attainment, and personal income. To measure a young adult's health status, data from the "General Health and Diet" section in Add Health Waves 3 and 4 are used. The outcome is constructed from the answers to the survey question "*In general, how is your health?*" The categories of the answer include "excellent" (1), "very good" (2), "good" (3), "fair" (4), and "poor" (5). Another two categories ("refused" and "don't know") are considered as missing values. For ease of interpretation, the outcome variable has been transformed as "excellent" (5), "very good" (4), "good" (3), "fair" (2), "poor" (1). According to the new ranking order, the higher the value of the variable is, the better the health status of the young adult has.

Summary statistics for health status outcome according to health insurance coverage of adolescents are displayed in Table 17. The mean of the health outcome variable is 3.75 for young adults without health insurance during adolescence, and 3.85 for young adults with health insurance during adolescence. In the empirical analysis, the health status

variable is treated as continuous in the OLS regression, and as an ordinal variable in the ordered logistical regression. In the bivariate probit model, the health status outcome variable is redefined as a binary variable, with the value of 3 or above representing good health and the value of 2 or below representing fair or poor health.

To measure a young adult's educational attainment, I use the answers to the questions "*What is the highest grade or year of regular school you have completed?*" in Wave 3 and "*What is the highest level of education you have achieved to date?*" in Wave 4. The descriptions of the answers for the two questions in Wave 3 and 4 are different. For example, the answer to the question of educational attainment in Wave 3 has a minimum value of 6 (for Grade 6) and a maximum value of 22 (for 5 or more years of graduate school). The answer to the question of educational attainment in Wave 4 has a minimum value of 1 (Grade 8 or less) and a maximum value of 13 (for completion of post baccalaureate professional education). For the purposes of analysis, the answer ranges must be consistent: The same number should indicate the same education level. Therefore, I redefine the codes of the answers and construct an educational attainment variable based on the redefined answers. The resulting variable has 6 ordered levels, with 1 = *Grade 8 or less*, 2 = some *high school,* 3= *high school graduate*, 4 = *completed/some vocational/technical training (after high school)*, 5 = *completed/some college*, and 6 = *some graduate school or more*. The original answers to the questions in Waves 3 and 4 are grouped into the new corresponding answer categories. For example, for a respondent who answers *Grade 6* in Wave 3, the original value for educational outcome is 6; however the value according to the newly constructed educational outcome variable is 1.

For a respondent who answers *Grade 8 or less* in Wave 4, the original value for educational outcome is 1, and the value of the newly constructed variable is 1 as well.

Table 17 shows the mean of the education outcome for different groups. For young adults with health insurance during adolescence, the mean is 4.30. For those without insurance during adolescence, it is 3.81. Like the health status outcome variable, the measure of educational attainment is considered a continuous variable in the OLS analysis and an ordinal variable in ordered logistical analysis.

The third outcome variable is the young adult's personal earnings of young adults. The values of this variable are based on answers to the question "*In {2000/ 2001}, how much income did you receive from earnings—that is, wages or salaries, including tips, bonuses, and overtime pay, and income from self-employment?*" and the question "*In {2007/ 2008}, how much income did you receive from earnings—that is, wages or salaries, including tips, bon uses, and overtime pay, and income from self-employment?*" in Wave 4. If, for some reason, the respondent could not answer these questions, the survey asks "*What is your best guess of the income you received from earnings?*" The personal earnings outcome variable is constructed from the responses to these two questions. The variable is used as a continuous in the OLS regression analysis. In the ordered logistical regression, an ordinal variable is constructed based on the continuous variable. Therefore, the ordinal variable is given 10 values, with 1 = 0–$10,000, 2 = $10,000–$20,000 . . . and 10 = $90,000 or more.

Summary statistics for the personal earnings variable are shown in table 17. The mean is $21,269 for young adults who did not have health insurance during adolescence and $24,737 for those who had insurance during adolescence.

Health insurance status of adolescent

The key explanatory variable in the empirical analysis is the health insurance status of adolescents. Adolescent health insurance status is a binary variable, such that 1 = *covered by health insurance during adolescence* and 0 = *not covered by health insurance during adolescence*. The variable is derived from the parents' answer to the question "What kind of health insurance does the respondent's child have?" from parent interviews in Wave I. The answers include "1. Medicaid," "2. Medicare," "3. Private," "4. Prepaid," "5. Other," "6. Being uncovered," and "7. Don't know." For the purpose of this study, the variable is set equal to one if the answer is from 1 to 5, and zero if the answer is 6. If the answer is 7, the answer is treated as missing value.

Table 18 shows that around 50% of the adolescents had private health insurance during adolescence, around 25% had prepaid health insurance, 8% had Medicaid, 0.8% had Medicare, and 4.3% had other types of health insurance. The remaining 11.9% of the adolescents had no health insurance.

Control variables

Several characteristics of adolescents, their parents, and young adults are used as control variables in the empirical analysis. The characteristics of the young adults include

their gender, age, ethnic background, whether or not they are currently enrolled in school at the time of interview, and their health-related habits such as smoking. These variables are based on information provided in the Add Health Wave 3 and Wave 4 in-home interviews. Single parent indicator is a dummy variable which means whether the adolescent is from Single parent. Female young adult equal 1 for a female respondent and 0 for a male respondent. Age is a continuous variable, whereas ethnic background is a series of dummy variables for being White, African American, Hispanic, Asian, and Other. The control variables also include a series of dummy variables for states. There are 41 states represented in the sample, each of which is represented by a dummy variable to control for state specific effects.

The characteristics of the adolescents that could affect their future well-being include their health status and household income. Health status is an ordinal variable, which includes categories of "excellent" (5), "very good" (4), "good" (3), "fair" (2), "poor" (1).

In Wave 1, parents' characteristics include their health status, educational attainment, and employment status. These variables are based on responses to questions in Wave 1 of the Add Health Survey. Health status is an ordinal variable with values of "excellent" (5), "very good" (4), "good" (3), "fair" (2), "poor" (1). Educational attainment is also ordered, representing different levels of parental education achievement from "never went to school" (1) to "professional training beyond a 4-year college or university" (10). Parental education and health are included in the model as a series of dummy variables. For example, there are five dummy variables for mother's health: 5 = *excellent*, 4 = *very good*, 3 = *good*, 2 = *fair*, and 1 = *poor*. The sensitivity tests also include analyses using parents' health and education as ordinal variables for

purposes of comparison. Parents' employment status are binary variables, indicating whether or not the parents were employed at the time of the interview.

Summary statistics for the control variables are shown in Table 17. The table indicates that, (1) male young adults tend to have higher ratio of insurance coverage than female young adults; (2) when adolescents grow up, they tend to drop health insurance coverage; (3) Hispanic young adults are more likely to be uncovered during adolescence; (4) Non-Hispanic white young adults are more likely to be covered during adolescence; (5) young adults with health insurance as adolescents have a higher probability of being covered by insurance later on.

Table 17 also shows that, (1) insured adolescents have a higher self-evaluation of their health outcomes than uninsured adolescents; (2) insured adolescents have a higher mean value of household income than uninsured adolescents; (3) parents of insured adolescents have better health status, higher educational attainment, and a higher likelihood of being employed than parents of uninsured adolescents.

4.2.4 Descriptive statistics

The descriptive statistics for outcomes and explanatory variables used in the analysis are presented in Tables 16–19. Tables 16–18 show the statistics based on the original data set without any treatment of missing values. Tables 19 show the statistics based on the data set with multiple imputation.

For the dependent variables, there were two missing values for young adult health status, nine missing values for young adult educational attainment, and 2086 missing

values for young adult personal earnings. For the independent variables, there were even more missing values, especially for parents' background.

Table 17 shows that adolescents who had health insurance (the main explanatory variable) also tended to have higher average health outcomes, educational attainment, and personal earnings as young adults than those who did not have insurance. The difference between the treatment (insured) and control (uninsured) groups is presented in Table 17. In general, adolescents with health insurance had better health, higher family income, and better health-related habits in young adulthood than those who did not have health insurance.

Table 18 shows summary statistics for the outcomes and explanatory variables across the different types of insurance groups. Adolescents who had private or prepaid health insurance had the highest future achievement outcomes, as reflected by the three dependent variables with the highest values. One interesting finding shown in Table 18 is that young adults who had Medicaid or Medicare in adolescence had lower achievement outcomes than those who had no health insurance. This seemly negative correlation between Medicaid/Medicare and future outcomes appears to have been caused by other factors that contributed to the lower outcomes. For example, household income could affect adolescents' future well-being. As Table 18 shows, the group of young adults with Medicaid had dramatically lower household income than other groups, even the group of uninsured adolescents. The regression results presented in the following section are better indicators of causal inference because they controlled for these other factors.

Tables 19 shows the summary statistics for data sets with multiple imputation. The means and signs of the differences in the table are similar to those shown in Table 17.

4.3 Regression results

4.3.1 OLS and ordered logistic estimates

The first set of results uses linear regression and ordered logistic regression to estimate Equation 7 based on the data set with multiple imputation. Control variables include young adult characteristics, adolescent characteristics, and parental characteristics, and state and time dummies. In the OLS regression, all three outcome variables are treated as continuous. In the ordered logistical regression, the health and education outcomes are treated as ordinal variables, with higher values reflecting better health and educational attainment. For ordered logistical regression of the personal earnings outcome, an ordered categorical variable based on the continuous variable is used. The ordered earnings measure was assigned 10 values (1 = 0–$10,000, 2 = $10,000–$20,000 . . . and 10 = $90,000 or more).

The OLS and ordered logistic estimates are presented in Tables 20 and 21. The standard errors haven been adjusted by clustering by adolescent ID. Both sets of results indicate that young adults who are covered by health insurance during adolescence have higher education level than those who are not covered. The positive impact on education is significant at the 1% level for both the OLS and ordered logistic regressions. The OLS result indicates that having health insurance in adolescence could increase education level by 0.14. The effect of health insurance during adolescence on personal earnings in young

adulthood is also positive and statistically significant at 5% (OLS) level. The results indicate adolescents having health insurance could earn $1648 more in the future than those being uncovered. The significant positive effects of health insurance on education and personal earnings indicate that health insurance during adolescence could be an important influence on later socioeconomic status. One possible explanation of the positive effects is that health insurance coverage during adolescence could be positively correlated with health status and education during adolescence, and these positive effects may carry on into young adulthood, resulting in higher earnings when these individuals enter the labor force. In section 3, the results suggest that health insurance of adolescent is positively correlated with their current health, which could be one of the mechanisms through which health insurance during adolescence affects educational attainment and earnings later in life.

For health status outcome during young adulthood, the results of both the OLS and ordered logistic regressions suggest that health insurance of adolescents has a positive but insignificant effect on health status in young adulthood (2% in OLS and 4% in ordinal logistic regression).

Table 22 shows the marginal effects of health insurance on future health and education, based on ordered logistic regression. The marginal effects on personal earnings are not displayed here, since personal earnings are originally continuous variable which is easier to understand the effects based on OLS results. The marginal effects of health insurance on education are all positive and significant. The largest effects is on "complete/some college", which has probability of 5% of achieving this education level

for young adult with health insurance in adolescence. The marginal effects on health are positive and not significant.

The OLS and ordered logistic estimates could be biased due to the potential endogeneity problem caused by unobserved determinants correlated with both health insurance and future outcomes. For example, the unobserved relationship between parents and children may affect both the health insurance status of child and his or her future well-being. Another example is the social and economic climate of the state in which the child resides, which is difficult to specify in the model. The social and economic climate may affect the state's child health insurance policy, and thus the child's health insurance status. The social and economic climate also could have a potential impact on the child's future health, educational achievement, and income. Because such unobserved variables are not controlled for in the estimation, the error term of the model could be correlated with the child's health insurance status, leading to selection bias.

4.3.2 Endogeneity test

Durbin-Wu-Hausman Tests

As aforementioned in section 3, the Durbin-Wu-Hausman tests may be used to test the consistency of least squares estimates when some explanatory variables may be endogenous (Davidson, MacKinnon, 1993). I use DWH to test if endogeniety can be ignored in the models. To test for the existence of endogeneity, I conduct bivariate probit. The results are detailed later in the section 4.3.3.

The DWH tests in this study are based on the two following equations:

$$HI = a_0 + a_1 * HIPRO + a_2 * X_2 + \epsilon_1, \quad (16)$$

$$Y = b_0 + b_1 * HI + b_2 * X_3 + \epsilon_2, \quad (17)$$

where HI is health insurance status of the adolescent, HIPRO is a constructed instrumental variable, defined as "the proportion of adolescents who have health insurance in the community". X_2 is a series of other variables that may affect health insurance coverage of adolescents. Y is the young adults' achievement outcomes, and X_3 is a series of other variables that may influence young adults' outcomes.

The Hausman tests consist of the following two steps:

Step 1: Regress HI on HIPRO, X_2 , and X_3

$$HI = c_0 + c_1 * HIPRO + c_2 * X_2 + c_3 * X_3 + \epsilon_3, \quad (18)$$

Step 2: Regress Y on HI, X_3 and predicted residual from the first regression.

$$Y = d_0 + d_1 * HI + d_2 * X_3 + d_3 * HI_{res} + \epsilon_4, \quad (19)$$

where HI_{res} is the predicted residual from the first step. If the coefficient of the predicted residual is significantly different from zero, then one can conclude that OLS is not consistent, i.e. that it is necessary to use the instrumental variable to control for bias.

Tables 23 through 25 shows the results of the Hausman test when the outcome variables are health status, education level and personal earnings, respectively. The results are based on data set with multiple imputation. For each of the three outcomes, the coefficient of HI_{res} is negative and significant at 1 percent. These results indicate that the

null hypothesis that potential endogeneity problem can be ignored in equation (7) is rejected.

Bivariate Probit Analysis

The purpose of the Hausman test is to see whether the potential endogeneity problem can be ignored in the models. To test for the existence of potential endogeneity in Equation (7), bivariate probit analysis is used to examine whether the error terms in Equations (11) and (12) are correlated (i.e. if rho in Equation (13) is not equal to zero). Because bivariate probit analysis is based on binary outcome variables, I recode the ordinal health outcomes variable into a binary variable. If health status of young adults is above 3 (good health or above), then the constructed binary health outcome variable equals 1; otherwise, it equals zero, which indicates "fair" or "poor" health. The education and earnings outcomes are also transformed to dummy variables, which indicate whether the young adult is high school graduate or not, and whether the young adult has annual personal earnings above the median of personal earnings or not, respectively. Since the outcome variables are originally ordinal or continuous variables, it may not be accurate to use the results of bivariate probit analysis to identify the endogeneity problem in Equation (7). The purpose of conducting bivariate probit analysis in this study is to provide some implications whether Equation (7) could possibly have selection bias.

The control variables used in Equations (11) and (12) are similar to the ones used in conducting the Hausman test. Table 26-28 present the results of the bivariate probit

analysis. For health outcome and personal earnings, the high values of the chi-square statistics indicate that the null hypothesis (rho in equation (13) equals zero) can be rejected at the 1% significance level for health outcome and at the 10% for personal earnings. For education outcome, the chi-square is low, which indicate the hypothesis that there is no endogeneity when outcome is dummy education variable can not be rejected. The coefficient of health insurance in Equation (12) is not significant, which implied the hypothesis that adolescent health insurance has no effect on high school graduate for young adult. The results for education outcome are perplexing, as the OLS/ordered logit results show health insurance have positive and significant correlation with future education outcome. One of the potential reasons could because adolescent health insurance may have stronger impacts on other higher education level, but not very strong relationship with high school graduate level. Although the chi-square is low for education, the potential endogeneity still needs to be controlled for, since 1) the outcome variables in Equation (7) and in bivariate probit analysis are different. It is not appropriate to use bivariate probit to conclude there is no endogeniety problem in Equation (7); 2) the low chi-square only suggests the hypothesis of no endoneneity could not be rejected, but not indicate there is no endogeneity issue; and 3) Hausman tests indicates the endogeneity problem could not be ignored for education outcome in Equation (7). In section 4.3.4 and 4.3.5, I use PSM and TSLS to control for the potential endogeneity in the estimation of Equation (7).

4.3.3 Propensity score matching

I use PSM to estimate effects of health insurance on future outcomes and compare the results to those from the OLS and ordered logistic analyses. The PSM method consists of three steps: the first generates a propensity score for having health insurance for each person in the treatment group (those covered by health insurance) and the control group (those not covered by health insurance). The variables used to predict the propensity scores are the same as those in the first stage of the TSLS procedure. The second step of the PSM uses the predicted propensity scores to match subjects. In the analysis, I use both nearest neighbor matching and kernel matching methods. The final step of the PSM calculates the difference in outcomes between the treatment and control groups. This approach estimates the so-called average treatment effect on the treated, which gives the average effect for those individuals who receive the treatment. In our case, it is interpreted as the average effect of having health insurance as adolescent on the different outcomes for those individuals who indeed had insurance as adolescents (as opposed to, say, for someone randomly chosen from the population).

The estimated average treatment effects for the treated (ATT) are displayed in Tables 29 and 30 for the nearest-neighbor-matching and kernel-matching methods, respectively. Both tables indicate that adolescent health insurance coverage is positively correlated with future health and education. The effect of health insurance coverage on future personal earnings is not significant for nearest-neighbor matching, but is significant at the 1% level for Kernel matching method. The difference in treatment and control group has the same sign as OLS and ordered logistic regression, but the magnitude is, in general, higher than OLS regression. For Kernel matching, adolescents

having health insurance could increase future health by 0.07, future education by 0.90, and future personal earnings by around $2248, while the coefficients in OLS are around 0.02 for health, 0.14 for education, and $1648 for personal earnings.

4.3.4 TSLS

I also conduct TSLS to control for the selection bias. In the first stage, equation (14) is estimated using OLS. The control variables in equation (15) include the adolescents' gender and age, household income, each parent's ethnic background, health, education and employment characteristics, and state dummies.

The instrumental variable in the equation is the constructed variable HIPRO, that is, "the proportion of adolescents who have health insurance in the community". It is constructed based on the information about the community and health insurance status of adolescents in the survey data. There are 96 communities in total in the sample for analysis. The assumption behind using HIPRO as an instrumental variable is that it is a good indicator of the health insurance status of the adolescent (the higher the proportion of adolescents being covered in the community, the more likely the adolescent is covered), and it doesn't seem to affect young adults' achievement outcomes.

Table 31 and 32 show the results of the two stages based on data set with single imputation. Stata command "*ivregress*" is used for the correction of standard errors, with vce option to cluster by community. The coefficients of the control variables in the first stage are consistent with previous studies (Kaiser, 2007). Adolescents from higher income families are more likely to be covered by health insurance than those from lower

income families. When household income increases by $1,000, the probability of an adolescent being covered by health insurance is predicted to increase by 0.04%.

Health insurance status is also affected by the parents' ethnic, health, education and employment background. If the mother is Hispanic or Native American, an adolescent will be 5% or 4% less likely to be covered by health insurance. If the father is Hispanic, an adolescent will be 4% less likely to have health insurance. The coefficient of mother's employment, education, and health are in general positive and significant. The mother's employment is estimated to increase the probability of having health insurance by 2.3%. In general, the higher the levels of the mother's education, the more likely the adolescents are to be covered. The healthier the mother is, the higher the probability of the adolescent being covered. Single parent indicator is negatively related to their health insurance status and the correlation is significant. Single parent adolescents are 5% less likely to be covered.

As table 31 indicates, adolescents from communities with higher HIPRO will have a higher probability of being covered. The standard error is adjusted by clustering by community. The estimated effect is significant at the 1 percent level. The F value of the regression is around 29 for health and education outcomes, and 28 for personal earnings outcome. These results indicate that the instrument is not weak, that is, HIPRO has a significant and positive correlation with the health insurance status of the adolescents.

In the second stage, equation (15) is estimated using the predicted health insurance status from the first stage estimation. OLS regression is applied for the estimation. Table

32 shows the main results of the estimation when the outcome variables are young adults' health status, educational attainment, and personal earnings respectively.

Column I of Table 32 displays the coefficients and standard errors when the outcome variable is the young adults' health status. The coefficient of the health insurance coverage is positive, which is consistent with the OLS and ordered logistic results. The value of estimate is 0.78, which implies having health insurance could lead to the increase of health status by 78%. The magnitude of the estimate is much higher than OLS estimate, which needs further study. Another difference between OLS/Ologit and TSLS results about health outcome is that the coefficient is not significant in OLS and ordered logistic regression, but significant at 1% in TSLS. The difference could be caused by different analysis methods applied in the estimation, and also could be caused by different data sets they use. OLS and ordered logistic regression results are based on data set with multiple imputation, while TSLS is based on data set with single imputation, due to the difficulty of applying Stata command *mim* for TSLS. To clarify the reason for the different significance between TSLS and OLS/ordered logistic regression, additional analysis is done for OLS and ordered logistic analysis on data set with single imputation when outcome variable is young adults' health. The coefficient of health insurance is positive and not significant, which are similar to the OLS/ordered logistic regression based on multiple imputation results. The results imply that the use of different data sets in the OLS/ordered logistic and in the TSLS is not the reason for the difference of significance.

As for the control variables, some notable findings are: 1) Mother's education level is positively correlated to young adults' health status; 2) Father's employment has

positive correlation with adolescent's health, while coefficient for mother's employment is negative; 3) male young adults are healthier than female young adults; 4) as the young adults get older, they become healthier; 5) Native American young adults have worse health condition than young adults of other ethnic background; 6) smoking decreases health outcomes of young adults by 14%.

Column II of table 32 presents the results when the outcome variable is the young adults' education level. The effect of health insurance of adolescents on their future education is positive and statistically significant at the 1 percent level. Having health insurance also leads to higher educational attainment of the young adults by 1.409 units. The magnitude is much higher than OLS estimates, which is similar to the results for health outcome and needs further study. The findings with respect to the control variables are consistent with the OLS and ordered logit results: 1) Mother's health have positive impacts on young adults' education; 2) female young adults achieve higher education than males, and older adults achieve higher education than younger ones; 3) Asian young adults have higher education level than young adults with other racial backgrounds. 4) Native American young adults have lower education achievement than young adults with other ethnic background.

The results for young adults' personal earnings are displayed in column III of Table 32. Health insurance of adolescents is positively related to their future personal earnings. Those individuals who have health insurance as adolescents tend to earn $17,044 more (per year) than those who are not covered. The household income of adolescents also has a positive effect on their future personal earnings. As household income increases by $1,000, personal earnings of young adults are predicted to increase by $10. Female

young adults earn much less than males ($7,485 lower earnings if the young adult is female). As young adults aged, average earnings rise by $1,473 per year. African and Native American young adults have lower earnings than young adults with other racial backgrounds, whereas Asian American young adults have the highest personal earnings than others. Having more previous average work experience could lead to higher personal earnings for young adults.

The major findings of the TSLS results are in general consistent with the OLS estimates with regard to the signs of the coefficient. Health insurance of adolescents is significantly related to their future education and personal earnings. The only exception is that the estimate of health insurance on future health from TSLS is positive and significant, after controlling for endogeniety in TSLS. However, the magnitude of the coefficient of health insurance is much bigger in TSLS than in OLS, which needs further study.

4.4. Sensitivity tests

The sensitivity tests include two parts: (a) conducting OLS, ordered logistic regression, and TSLS on the original data set without any imputation to determine if the main results were consistent with the previous results in Section 4.3; and (b) conducting OLS, ordered logistic regression, and TSLS on the data set with imputation using parents' education and health as ordinal variables instead of a set of dummy variables in the analysis in order to determine if the main results were consistent with previous results in Section 4.3.

4.4.1 Empirical analysis based on data set without imputation

For comparison purposes, I conduct analyses on the original data without any imputation. The results are displayed in Table 33-35, for OLS, ordered logistic, and TSLS analyses, respectively. The effects of adolescent health insurance on future education and personal earnings are positive and significant, consistent with the results in Section 4.3. The magnitude of the effects is also close to OLS results based on imputed data. For example, the OLS results in Table 33 indicate that having health insurance could lead to the increase of education level by 14.1%. The table also implies that adolescents with health insurance tend to earn $2073 more than those who are uncovered. The results for health outcome are slightly different. The coefficient in the OLS and ordered logistic regression is negative and not significant (-2%), in contrast with the positive and insignificant coefficient (2%) in the previous OLS, (4%) ordered regression analysis, and the positive and significant coefficient (78%) in TSLS results in section 4.3. The reason for the difference in results for health outcome using the original data set and the data set with imputation is uncertain and requires further study.

One of the possible reasons for the difference of results could be that when using listwise deletion, the large percentage of missing values for father's background can lead to biased estimates, as the missing data are not MCAR. Those adolescents living with mothers who are not married or not living with their spouse/partner are more likely to have missing data for father's background, and more likely to live in a lower income family. One of the ways to cope with the missing data for father's background is to exclude the related variables in the models. Table 36-38 show the results based on the original data set without imputation, for OLS, ordered logistic and TSLS regression

excluding father's information. The results are more closely aligned with the results in section 4.3, positive and significant coefficients of health insurance for education and personal earnings outcomes for OLS regression. For example, the OLS results indicate that having health insurance could lead to the increase of education level by 20.2%. The table also implies that adolescents with health insurance tend to earn $1462 more than those who are uncovered. For health outcome, the coefficient of health insurance is positive and not significant for OLS (0.6%) and ordered logistic estimates (0.1%), but positive and significant for TSLS estimates (72.6%).

The other findings, shown in Table 36-38 are in general consistent with previous results. Household income, parents' education, and health are positively associated with better outcomes for young adults. Female respondents have better education, but worse health condition and earnings than male respondents. Native American young adults have worse education, health and earnings than young adults with other ethnic background. Smoking has negative effect on health, and working experience contributes to higher earnings for young adults.

4.4.2 Empirical analysis with parents' education and health as ordinal variables

The second part of the sensitivity tests include OLS, ordered logistic regression, and TSLS using ordinal variables for parents' education and health. Like the analyses in section 4.3, the OLS and ordered logistic regression are based on the data set with three imputations, and the TSLS is based on the data set with the single imputation. The main results are displayed in Table 39-41.

The main findings are consistent with results in section 4.3. For OLS and ordered logistic analysis, health insurance of adolescents has a positive but not significant coefficient when the dependent variable is health outcome. The coefficient is positive and significant coefficient (1.5%) when the dependent variables are education and personal earnings. For example, the OLS results in Table 16 indicate that having health insurance could lead to the increase of education level by 12.9%. The table also implies that adolescents with health insurance tend to earn $2409 more than those who are uncovered. For the TSLS, the effects of health insurance on all three outcomes are positive and significant. The magnitude of the effects is higher than results of TSLS based on imputed data. The coefficients are 1.029 for health outcome, 1.304 for education, and $14017 for personal earnings, comparing with 0.78 for health outcome, 1.409 for education, and $17044 for personal earnings from previous TSLS results based on imputed data.

Chapter 5

Conclusion

One of the major findings of this study is that adolescents who are covered by health insurance have significantly higher future educational attainment and personal earnings. Having health insurance could lead to the increase of future education attainment by 14.4% (OLS) and by 140.9% (TSLS). Adolescents who have health insurance tend to have $1648 more (OLS) or $17044 more (TSLS) personal earnings than those who do not have. However, perhaps somewhat perplexingly, the effect of health insurance on future health status is statistically insignificant based on OLS and ordered logistic regression, although positive and significant for the preferred TSLS estimates based on data set with imputation. The TSLS estimates based on original data set without imputation has negative and insignificant coefficient for health insurance, which suggests the acceptance of previous TSLS estimates needs to be cautious. The results presented here are consistent with the results of previous studies that find positive effects of health insurance of children on their current well-being (Kempe, Beaty, Crane, 2005, Yeung, et al. 2010), and positive effects of current well-being of children on their future education and labor market outcomes (Case, Fertig and Paxson, 2004).

Another finding from this study is the disparities of health insurance coverage among adolescents of different gender, ethnic, and age groups. Female adolescents are less likely to be covered than male adolescents. Hispanic and American Indians tend to have no health insurance during adolescence. When adolescents become young adults, they are more likely to drop their health insurance. Social economic status is another

important factor behind the choice of health insurance among adolescents. Household income is positively related to health insurance coverage of adolescents. Parents' characteristics also affect the likelihood of health insurance coverage of their kids. More educated parents are more likely to buy health insurance for their children and employed parents are more likely to buy health insurance for their children than unemployed parents.

One of the contributions of this study is that it directly measures the effects of health insurance coverage of children on their future well-being. Many previous studies have focused on the effect of health insurance of children on their *current* well-being, with few studies examining the potential effects of health insurance on children's future development. Some researchers find positive impacts of health status or education of children on their future outcomes. These studies imply, but do not directly measure, the potential effects of health insurance coverage of children on their future well-being. To the best of my knowledge, this is the first study that directly quantifies the effects of health insurance coverage of children on their future educational and economic achievements.

Another contribution of this study is that it applies a variety of approaches to control for the potential endogeneity caused by non-random selection of health insurance coverage. Hausman tests are performed to validate the existence of selection bias and two-stage least squares (TSLS) is used to adjust for the bias. Propensity score matching and bivariate probit analysis are also utilized to examine the robustness of the core findings. The consistency of the results from the different analytic methods indicates a

positive causal effect of health insurance coverage of adolescents on their future educational attainment and labor market earnings.

Future research on this topic could address the cause of the difference in results between analyses using the data set without imputation and the data set with imputation when the outcome variable is health status. One of the reasons could be that the large percentage of missing data for father's background leads to biased estimates, as it may be related to other variables like household income of adolescents. The analyses in the sensitivity tests based on the data set without imputation and models excluding father's information show results similar to those of analyses based on the data set with imputation. However, further study is needed to clarify the theoretical reason behind the difference of health outcome analyses. Other imputation methods could also be adopted to test the robustness of the results.

Another area for further study is exploring other health outcome measures that might be more objective. In the Add Health study, the health outcome was self-evaluated by respondents. To obtain more-accurate measures of health, future studies could construct indexes of health status that include information about respondents' weight, height, illnesses, and so on.

Future research could also examine the effects of different types of health insurance. For example, data sets with information on state eligibility for Medicaid or SCHIP may be used to estimate the effects of social programs on children's future well-being. The Add Health data set used in this study did not contain information about SCHIP since the program had not yet started when the survey was first undertaken. Therefore, future

studies could make use of information on state eligibility for social programs related to health insurance of children as alternative instrumental variables for coverage of Medicaid or SCHIP. The results of such future studies could provide additional insight into the implications of health insurance policies for children.

Table 1. Summary Statistics – Original Data without Imputation

Variable	Mean	Std. Dev.	N
Health outcomes of adolescents	3.877	0.914	20719
Health insurance			
Being covered at interview	0.873	0.333	17499
Being covered in the past 12 months	0.804	0.397	17548
Ratio of having health insurance in the community	0.87	0.09	20745
Ratio of having health insurance in the past 12 months in the community	0.801	0.106	20745
Being covered by Medicare	0.012	0.11	17683
Being covered by Medicaid	0.101	0.301	17683
Being covered by Private	0.495	0.5	17683
Being covered by Prepaid	0.24	0.427	17683
Being covered by Other	0.045	0.206	17683
Adolescents' characteristics			
Female adolescents	0.506	0.504	20745
Age of adolescents	16.204	1.746	20745
Adolescent(Hispanic)	0.17	0.376	20683
Adolescent(Non Hispanic White)	0.616	0.486	20704
Adolescent(African)	0.232	0.422	20704
Adolescent(Indian)	0.036	0.186	20704
Adolescent(Asian)	0.077	0.266	20704
Adolescent(Other)	0.095	0.293	20704
How often eat vegitables	0.942	0.782	20714
Having enough sleep	0.717	0.45	20707
Household income of adolescents	45.728	51.617	15351
Parents' characteristics			
Mother's health	3.567	1.043	16632
Father's health	3.553	1.026	12871
Mother's education	5.404	2.39	16553
Father's education	5.544	2.462	12795
Mother's employment status	0.725	0.446	16633
Father's employment status	0.901	0.298	12903
Mother(Hispanic)	0.147	0.354	16568
Mother(Non-Hispanic White)	0.666	0.472	16573
Mother(African American)	0.216	0.411	16573
Mother(Indian American)	0.029	0.169	16573
Mother(Asian American)	0.059	0.235	16573
Mother(Other Ethnic background)	0.059	0.236	16573
Father(Hispanic)	0.137	0.344	12831
Father(Non-Hispanic White)	0.714	0.452	12880
Father(African American)	0.167	0.373	12880
Father(Indian American)	0.02	0.142	12880
Father(Asian American)	0.06	0.237	12880
Father(Other Ethnic background)	0.057	0.232	12880
Single parent indicator	0.301	0.459	17617

Table 2. Summary Statistics by Coverage – Original Data without Imputation

	(1)	(2)	(3)
	Not Covered	Covered	Difference
Health status of Adolescents	3.774	3.916	-0.142***
	(0.942)	(0.896)	[-8.21]
Female adolescent	0.516	0.502	0.0149
	(0.516)	(0.500)	[1.55]
Age of adolescents	16.31	16.03	0.279***
	(1.775)	(1.707)	[8.52]
Adolescent(Hispanic)	0.290	0.133	0.157***
	(0.454)	(0.339)	[22.66]
Adolescent(Non-Hispanic White)	0.571	0.661	-0.0893***
	(0.495)	(0.473)	[-9.80]
Adolescent(African)	0.236	0.223	0.0135
	(0.425)	(0.416)	[1.69]
Adolescent(Native)	0.0447	0.0355	0.0092*
	(0.207)	(0.185)	[2.56]
Adolescent(Asian)	0.0523	0.0628	-0.0105*
	(0.223)	(0.243)	[-2.30]
Adolescent(Other)	0.148	0.0751	0.0731***
	(0.355)	(0.264)	[13.51]
Household income of adolescents	26.88	50.32	-23.44***
	(39.43)	(53.21)	[-22.14]
How often eat vegetables	0.840	0.965	-0.125***
	(0.776)	(0.781)	[-8.43]
Having enough sleep	0.725	0.723	0.002
	(0.447)	(0.448)	[0.24]
How often feel depressed	0.595	0.514	0.081***
	(0.782)	(0.752)	[5.60]
Single parent indicator	0.394	0.276	0.119***
	(0.489)	(0.447)	[13.57]
Mother's employment status	0.645	0.747	-0.101***
	(0.478)	(0.435)	[-11.49]
Father's employment status	0.838	0.915	-0.0772***
	(0.368)	(0.278)	[-11.17]
Mother's health status	3.255	3.648	-0.393***
	(1.083)	(1.017)	[-19.21]
Father's health status	3.249	3.618	-0.369***
	(1.116)	(0.993)	[-15.53]
Mother's education	4.306	5.677	-1.370***
	(2.400)	(2.306)	[-29.60]
Father's education	4.227	5.832	-1.605***
	(2.464)	(2.366)	[-28.61]
Observations	3435	14113	17548

mean coefficients; sd in parentheses,t statistics in []

$* p < 0.05, ** p < 0.01, *** p < 0.01$

Table 3. Summary Statistics – Multiple Imputation

	(1)	(2)	(3)
	Not Covered	Covered	Difference
Health status of adolescents	3.776	3.906	-0.130***
	(0.946)	(0.902)	[-14.82)
Female adolescent	0.514	0.503	0.011*
	(0.514)	(0.501)	[2.29)
Age of adolescents	16.46	16.13	0.325***
	(1.772)	(1.732)	[19.37]
Adolescent(Hispanic)	0.281	0.139	0.142***
	(0.450)	(0.346)	[39.69]
Adolescent(Non-Hispanic White)	0.536	0.638	-0.103***
	(0.499)	(0.480)	[-21.96]
Adolescent(African)	0.239	0.230	0.009*
	(0.427)	(0.421)	[2.30]
Adolescent(Native)	0.0407	0.0343	0.006***
	(0.198)	(0.182)	[3.56]
Adolescent(Asian)	0.0854	0.0740	0.011***
	(0.279)	(0.262)	[4.46]
Adolescent(other)	0.150	0.0794	0.070***
	(0.357)	(0.270)	[25.09]
Household income of adolescents	28.08	49.11	-21.03 ***
	(43.97)	(52.50)	[-43.04]
How often eat vegitables	0.869	0.962	-0.093 ***
	(0.781)	(0.781)	[-12.41]
Having enough sleep	0.715	0.718	-0.002
	(0.451)	(0.450)	[-0.55]
How often feel depressed	0.597	0.522	0.0746***
	(0.783)	(0.753)	[10.19]
Single parent indicator	0.403	0.286	0.117***
	(0.490)	(0.452)	[26.34]
Mother's employment status	0.654	0.742	-0.088***
	(0.476)	(0.438)	[-20.58]
Father's employment status	0.853	0.900	-0.047***
	(0.354)	(0.300)	[-15.78]
Mother's health status	3.282	3.620	-0.338***
	(1.092)	(1.026)	[-33.71]
Father's health status	3.391	3.589	-0.198***
	(1.092)	(1.015)	[-19.87]
Mother's education	4.315	5.671	-1.357***
	(2.410)	(2.308)	[-51.64]
Father's education	4.242	5.824	-1.582***
	(2.468)	(2.369)	[-49.63]
Observations	12565	49670	62235

mean coefficients; sd in parentheses,t statistics in []

$* p < 0.05, ** p < 0.01, *** p < 0.01$

Table 4. OLS and Ordered Logistic Regression – Health Outcome of Adolescents

	(1)	(2)
	OLS regression	Ordinal logistic regression
Being covered in the past 12 months	0.0565***	0.0983***
	(0.0187)	(0.0325)
Household income of adolescents	0.0001	0.0004
	(0.0002)	(0.0003)
Mother's employment status	-0.0265*	-0.0558*
	(0.0146)	(0.0307)
Father's employment status	0.0410	0.1361***
	(0.0342)	(0.0473)
Adolescent(Hispanic)	-0.0261	-0.0409
	(0.0238)	(0.0491)
Adolescent(Non-Hispanic White)	-0.0643**	-0.1281**
	(0.0317)	(0.0665)
Adolescent(African)	0.0629*	0.1754**
	(0.0334)	(0.0699)
Adolescent(Native)	-0.1210***	-0.2193***
	(0.0348)	(0.0716)
Adolescent(Asian)	-0.1541***	-0.3164***
	(0.0378)	(0.079)
Adolescent(Other)	-0.0220	-0.0391
	(0.0369)	(0.0771)
Female adolescent	-0.1276***	-0.2791***
	(0.0129)	(0.026)
Age of adolescents	0.0089**	0.0201***
	(0.0036)	(0.0076)
How often eat vegitables	0.0732***	0.1554***
	(0.008)	(0.0168)
Having enough sleep	0.1575***	0.3243***
	(0.0141)	(0.0295)
How often feel depressed	-0.1664***	-0.3328***
	(0.0085)	(0.0179)
Single parent indicator	-0.0579***	-0.1268***
	(0.0177)	(0.0299)
Mother(Health:poor)	0.0091	-0.4805***
	(0.0285)	(0.0801)
Mother(Health:fair)	-0.0046	-0.5163***
	(0.0345)	(0.0496)
Mother(Health:good)	0.0560	-0.4017***
	(0.0352)	(0.0388)
Mother(Health:very good)	0.1361***	-0.2038***
	(0.0353)	(0.0376)
Mother(Health:excellent)	0.2264***	
	(0.0354)	
Father(Health:poor)	0.0102	-0.0859
	(0.0299)	(0.08)
Father(Health:fair)	0.0046	-0.1334***
	(0.0319)	(0.0514)

Father(Health:good)	0.0276	-0.0971**
	(0.0357)	(0.0384)
Father(Health:very good)	0.0681*	-0.0305
	(0.0387)	(0.0377)
Father(Health:excellent)	0.0857*	
	(0.0451)	
Mother(Never went to school)	0.1970	0.4630
	(0.1946)	(0.3974)
Mother(8th grade or less)	-0.0326	-0.0740
	(0.0345)	(0.0626)
Mother(above 8th grade,not graduate from high school)	-0.0148	-0.0424
	(0.0251)	(0.0492)
Mother(Business,trade or vocational school)	-0.1037	-0.2320
	(0.0765)	(0.1437)
Mother(High school graduate)	-0.0015	-0.0202
	(0.0227)	(0.0392)
Mother(Completed a GED)	-0.0308	-0.0600
	(0.0363)	(0.0725)
Mother(Business,trade or vocational school after high school)	0.0063	-0.0271
	(0.0326)	(0.0497)
Mother(College, but did not graduate)	0.0199	0.0438
	(0.02)	(0.0413)
Mother(Graduated from a college or university)	0.0649**	0.1175**
	(0.0273)	(0.046)
Mother(Professional training after a 4-year college or university)	0.0854***	0.1881***
	(0.0283)	(0.0535)
Father(Never went to school)	0.0844	0.2322
	(0.3021)	(0.5169)
Father(8th grade or less)	-0.0424	-0.1473***
	(0.0427)	(0.0558)
Father(above 8th grade,not graduate from high school)	-0.0251	-0.0771*
	(0.0331)	(0.0468)
Father(Business,trade or vocational school)	-0.0285	-0.1118
	(0.0784)	(0.1309)
Father(High school graduate)	-0.0035	-0.0217
	(0.0266)	(0.033)
Father(Completed a GED)	-0.0353	-0.1344*
	(0.0507)	(0.0715)
Father(Business,trade or vocational school after high school)	-0.0335	-0.1100**
	(0.0292)	(0.047)
Father(College, but did not graduate)	0.0321	0.0180
	(0.0328)	(0.0371)
Father(Graduated from a college or university)	0.0305	0.0714*
	(0.0231)	(0.0389)
Father(Professional training after a 4-year college or university)	0.0826**	0.1370***

	(0.0291)	(0.043)
Birth weight	-0.0051	-0.0097
	(0.0048)	(0.0094)
Constant	3.4075*	
	(1.5984)	
Observations	20745	20745

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 5. Marginal Effects – Health Outcome of Adolescents

	Health insurance of adolescents
Adolescent (Health:poor)	-0.0004***
	(0.0001)
Adolescent (Health:fair)	-0.005***
	(0.001)
Adolescent (Health:good)	-0.015***
	(0.005)
Adolescent (Health:very good)	0.002**
	(0.001)
Adolescent (Health:excellent)	0.019***
	(0.006)
Observations	20745

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 6. Hausman Test

	(1)	(2)
	Health Insurance Coverage of Adolescents	Health Outcome of Adolescents
Being covered in the past 12 months		1.013***
		(0.0932)
Residual		-0.960***
		(0.0914)
Ratio of having health insurance in the past 12 months in the community	0.4850***	
	(0.0431)	
Household income of adolescents	0.0007***	0.000
	(0.0001)	(0.0002)
Mother's employment status	0.0194*	-0.031**
	(0.0096)	(0.015)
Father's employment status	0.0071	0.041
	(0.0115)	(0.0258)
Adolescent(Hispanic)	-0.0168	0.061**
	(0.0181)	(0.0271)
Adolescent(Non-Hispanic White)	-0.0011	-0.091**
	(0.0191)	(0.0345)
Adolescent(African)	0.0387	0.010
	(0.0239)	(0.0364)
Adolescent(Native)	0.0057	-0.124***
	(0.0186)	(0.0375)
Adolescent(Asian)	-0.0465	-0.083**
	(0.0392)	(0.0409)
Adolescent(Other)	-0.0174	-0.022
	(0.0199)	(0.0385)
Female adolescent	-0.0075	-0.120***
	(0.0061)	(0.0126)
Age of adolescents	-0.0121***	0.020***
	(0.0022)	(0.004)
How often eat vegitables	0.0047	0.070***
	(0.0039)	(0.0082)
Having enough sleep	-0.0055	0.162***
	(0.007)	(0.0144)
How often feel depressed	-0.0024	-0.168***
	(0.0038)	(0.0084)
Single parent indicator	-0.0578***	-0.003
	(0.0093)	(0.0221)
Mother(Health:poor)	-0.0070	
	(0.0171)	
Mother(Health:fair)	0.0143	
	(0.0233)	
Mother(Health:good)	0.0244	
	(0.0192)	
Mother(Health:very good)	0.0617***	
	(0.0167)	

Mother(Health:excellent)	0.0513*
	(0.0253)
Father(Health:poor)	-0.0146
	(0.0308)
Father(Health:fair)	0.0267
	(0.0371)
Father(Health:good)	0.0429
	(0.0355)
Father(Health:very good)	0.0497
	(0.0328)
Father(Health:excellent)	0.0448
	(0.0415)
Mother(Never went to school)	-0.0877
	(0.096)
Mother(8th grade or less)	-0.0984***
	(0.0174)
Mother(above 8th grade,not graduate from high school)	-0.0422**
	(0.0146)
Mother(Business,trade or vocational school)	-0.0547*
	(0.0311)
Mother(High school graduate)	-0.0033
	(0.0125)
Mother(Completed a GED)	-0.0612***
	(0.0173)
Mother(Business,trade or vocational school after high school)	0.0015
	(0.0172)
Mother(College, but did not graduate)	0.0103
	(0.0128)
Mother(Graduated from a college or university)	0.0203
	(0.0165)
Mother(Professional training after a 4-year college or university)	0.0292
	(0.0208)
Father(Never went to school)	-0.1097
	(0.1554)
Father(8th grade or less)	-0.0466**
	(0.0174)
Father(above 8th grade,not graduate from high school)	-0.0368
	(0.0216)
Father(Business,trade or vocational school)	-0.0280
	(0.0481)
Father(High school graduate)	-0.0010
	(0.013)
Father(Completed a GED)	-0.0020
	(0.0188)

Father(Business,trade or vocational school after high school)	-0.0003	
	(0.0207)	
Father(College, but did not graduate)	0.0130	
	(0.0146)	
Father(Graduated from a college or university)	0.0144	
	(0.0098)	
Father(Professional training after a 4-year college or university)	0.0203	
	(0.0143)	
Birth weight	0.0020	
	(0.0022)	
Mother(Non-Hispanic White)	0.0185	
	(0.0246)	
Mother(African American)	-0.0100	
	(0.0303)	
Mother(Native American)	0.0138	
	(0.0195)	
Mother(Asian American)	0.0024	
	(0.0403)	
Mother(Other Ethnic background)	0.0136	
	(0.0243)	
Father(Hispanic)	-0.0582***	
	(0.0157)	
Father(Non-Hispanic White)	0.0067	
	(0.0248)	
Father(African American)	0.0146	
	(0.0353)	
Father(Native American)	-0.0672	
	(0.0329)	
Father(Asian American)	-0.0319	
	(0.0217)	
Father(Other Ethnic background)	0.0246	
	(0.0398)	
Constant	0.3059	2.663
	(0.6629)	(1.4452)
Observations	20745	20745

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 7. Propensity Score Matching

Outcome variable	Treated	Control	Difference	Std. Err.	T-Stat
Nearest Neighbor Matching	3.9041	3.8430	.0610 (**)	.0275	2.22
Kernal Matching	3.9041	3.8199	.0842 (***)	.0183	4.60

Table 8. TSLS – The First Stage

	Health Insurance Coverage of Adolescents
Ratio of having health insurance in the community	0.5026***
	(0.0402)
Mother(Never went to school)	-0.0633
	(0.1005)
Mother(8th grade or less)	-0.0875***
	(0.0159)
Mother(above 8th grade,not graduate from high school)	-0.0328***
	(0.0123)
Mother(Business,trade or vocational school)	-0.0518
	(0.0343)
Mother(High school graduate)	0.0055
	(0.0094)
Mother(Completed a GED)	-0.0537***
	(0.0177)
Mother(Business,trade or vocational school after high school)	0.0150
	(0.0112)
Mother(College, but did not graduate)	0.0192**
	(0.0097)
Mother(Graduated from a college or university)	0.0269***
	(0.0104)
Mother(Professional training after a 4-year college or university)	0.0392***
	(0.0113)
Father(Never went to school)	-0.1714
	(0.1411)
Father(8th grade or less)	-0.0351**
	(0.0138)
Father(above 8th grade,not graduate from high school)	-0.0294***
	(0.0112)
Father(Business,trade or vocational school)	-0.0334
	(0.0306)
Father(High school graduate)	0.0088
	(0.0076)
Father(Completed a GED)	0.0009
	(0.0169)

Father(Business,trade or vocational school after high school)	0.0080
	(0.0103)
Father(College, but did not graduate)	0.0158*
	(0.0083)
Father(Graduated from a college or university)	0.0179**
	(0.0084)
Father(Professional training after a 4-year college or university)	0.0291***
	(0.0089)
Mother(Health:poor)	-0.0385*
	(0.0197)
Mother(Health:fair)	-0.0274**
	(0.0111)
Mother(Health:good)	-0.0198**
	(0.0083)
Mother(Health:very good)	0.0168**
	(0.0076)
Mother(Health:excellent)	
Father(Health:poor)	-0.0555***
	(0.0193)
Father(Health:fair)	-0.0121
	(0.0114)
Father(Health:good)	0.0019
	(0.0083)
Father(Health:very good)	0.0111
	(0.0078)
Father(Health:excellent)	
Father's employment status	0.0096
	(0.0112)
Mother's employment status	0.0263***
	(0.007)
Mother(Hispanic)	-0.0329*
	(0.0173)
Mother(Non-Hispanic White)	0.0052
	(0.0216)
Mother(African American)	-0.0223
	(0.0258)
Mother(Native American)	0.0059
	(0.0193)
Mother(Asian American)	0.0341
	(0.0253)
Mother(Other Ethnic background)	0.0229
	(0.0242)
Father(Hispanic)	-0.0530***
	(0.0154)
Father(Non-Hispanic White)	0.0090
	(0.0215)
Father(African American)	-0.0074

Father(Native American)	(0.0243)
	-0.0651***
	(0.0198)
Father(Asian American)	-0.0419*
	(0.0233)
Father(Other Ethnic background)	0.0004
	(0.0237)
Adolescent(Hispanic)	-0.0089
	(0.017)
Adolescent(Non-Hispanic White)	-0.0112
	(0.017)
Adolescent(African)	0.0498**
	(0.0213)
Adolescent(Native)	-0.0027
	(0.0174)
Adolescent(Asian)	-0.0791***
	(0.0237)
Adolescent(Other)	-0.0268
	(0.0191)
Female adolescent	-0.0084
	(0.0055)
Age of adolescents	-0.0135***
	(0.0017)
How often eat vegitables	0.0039
	(0.0036)
Having enough sleep	-0.0063
	(0.0063)
How often feel depressed	-0.0023
	(0.0038)
Single parent indicator	-0.0533***
	(0.0069)
Household income of adolescents	0.0007***
	(0.0001)
Constant	0.6480***
	(0.0523)
Observations	20745

Standard errors in parentheses; Standard errors have been adjusted by clustering by community variable.

$* p < 0.10, ** p < 0.05, *** p < 0.01$

F(92, 20626) = 32.33

Table 9. TSLS – The Second Stage

	Health Outcome of Adolescents
Being covered in the past 12 months	0.2574*
	(0.1325)
Mother(Never went to school)	0.2630
	(0.1714)
Mother(8th grade or less)	-0.0197
	(0.0325)
Mother(above 8th grade,not graduate from high school)	-0.0140
	(0.0262)
Mother(Business,trade or vocational school)	-0.1196*
	(0.0719)
Mother(High school graduate)	-0.0145
	(0.0176)
Mother(Completed a GED)	-0.0275
	(0.0335)
Mother(Business,trade or vocational school after high school)	-0.0190
	(0.0171)
Mother(College, but did not graduate)	0.0159
	(0.0204)
Mother(Graduated from a college or university)	0.0480**
	(0.0225)
Mother(Professional training after a 4-year college or university)	0.0730***
	(0.0228)
Father(Never went to school)	0.1884
	(0.2463)
Father(8th grade or less)	-0.0620*
	(0.032)
Father(above 8th grade,not graduate from high school)	-0.0344
	(0.0229)
Father(Business,trade or vocational school)	-0.0239
	(0.0696)
Father(High school graduate)	-0.0156
	(0.0154)
Father(Completed a GED)	-0.0676**
	(0.0324)
Father(Business,trade or vocational school after high school)	-0.0495**
	(0.0224)
Father(College, but did not graduate)	0.0075
	(0.0185)
Father(Graduated from a college or university)	0.0330**
	(0.0161)
Father(Professional training after a 4-year college or university)	0.0622***
	(0.0221)
Mother(Health:poor)	-0.2179***
	(0.0385)
Mother(Health:fair)	-0.2388***
	(0.0205)

Mother(Health:good)	-0.1795***
	(0.0182)
Mother(Health:very good)	-0.0901***
	(0.0174)
Mother(Health:excellent)	
Father(Health:poor)	-0.0177
	(0.0421)
Father(Health:fair)	-0.0562**
	(0.0275)
Father(Health:good)	-0.0434**
	(0.0204)
Father(Health:very good)	-0.0122
	(0.0161)
Father(Health:excellent)	
Father's employment status	0.0643***
	(0.0184)
Mother's employment status	-0.0328**
	(0.0145)
Adolescent(Hispanic)	-0.0012
	(0.0239)
Adolescent(Non-Hispanic White)	-0.0710*
	(0.0364)
Adolescent(African)	0.0582
	(0.0364)
Adolescent(Native American)	-0.1116***
	(0.0389)
Adolescent(Asian)	-0.1408**
	(0.0592)
Adolescent(Other)	-0.0218
	(0.0526)
Female adolescent	-0.1273***
	(0.015)
Age of adolescents	0.0119***
	(0.0043)
How often eat vegitables	0.0714***
	(0.0084)
Having enough sleep	0.1592***
	(0.0156)
How often feel depressed	-0.1644***
	(0.0096)
Single parent indicator	-0.0473**
	(0.0204)
Constant	3.2031***
	(0.1632)
Observations	20745

Standard errors in parentheses; $* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 10. OLS Regression – Health Outcome of Adolescents: Original dataset

	(1) With father's background	(2) Without father's background
Being covered in the past 12 months	0.025	0.058**
	(0.0252)	(0.0207)
Household income of adolescents	0.000	0.000**
	(0.0002)	(0.0002)
Mother's employment status	-0.017	-0.018
	(0.0211)	(0.0185)
Father's employment status	0.076**	
	(0.0345)	
Adolescent(Hispanic)	-0.027	-0.033
	(0.0355)	(0.0303)
Adolescent(Non-Hispanic White)	0.009	-0.005
	(0.0474)	(0.0389)
Adolescent(African)	0.128**	0.104**
	(0.0510)	(0.0410)
Adolescent(Native)	-0.106**	-0.146***
	(0.0475)	(0.0414)
Adolescent(Asian)	-0.104*	-0.070
	(0.0564)	(0.0493)
Adolescent(Other)	0.046	0.054
	(0.0552)	(0.0464)
Female adolescent	-0.105***	-0.118***
	(0.0176)	(0.0154)
Age of adolescents	0.013**	0.013**
	(0.0052)	(0.0045)
How often eat vegitables	0.083***	0.078***
	(0.0114)	(0.0099)
Having enough sleep	0.181***	0.179***
	(0.0200)	(0.0174)
How often feel depressed	-0.154***	-0.152***
	(0.0122)	(0.0105)
Single parent indicator	-0.108***	-0.064***
	(0.0321)	(0.0182)
Mother(Health:poor)	-0.041	
	(0.0682)	
Mother(Health:fair)		-0.002
		(0.0518)
Mother(Health:good)	0.042	0.042
	(0.0331)	(0.0493)
Mother(Health:very good)	0.109**	0.137**
	(0.0335)	(0.0497)
Mother(Health:excellent)	0.171***	0.241***
	(0.0361)	(0.0508)
Father(Health:poor)	0.002	
	(0.0564)	
Father(Health:fair)		

Father(Health:good)	0.020	
	(0.0322)	
Father(Health:very good)	0.094**	
	(0.0329)	
Father(Health:excellent)	0.122***	
	(0.0363)	
Mother(Never went to school)		
Mother(8th grade or less)		-0.571
		(0.3573)
Mother(above 8th grade,not graduate from high school)	-0.004	-0.541
	(0.0540)	(0.3567)
Mother(Business,trade or vocational school)	0.070	-0.564
	(0.1061)	(0.3656)
Mother(High school graduate)	0.071	-0.488
	(0.0520)	(0.3564)
Mother(Completed a GED)	-0.055	-0.558
	(0.0659)	(0.3581)
Mother(Business,trade or vocational school after high school)	0.065	-0.479
	(0.0565)	(0.3569)
Mother(College, but did not graduate)	0.068	-0.473
	(0.0535)	(0.3565)
Mother(Graduated from a college or university)	0.123**	-0.409
	(0.0561)	(0.3568)
Mother(Professional training after a 4-year college or university)	0.094	-0.387
	(0.0603)	(0.3572)
Father(Never went to school)	0.531	
	(0.6155)	
Father(8th grade or less)	-0.098	
	(0.0964)	
Father(above 8th grade,not graduate from high school)	-0.075	
	(0.0911)	
Father(Business,trade or vocational school)		
Father(High school graduate)	-0.041	
	(0.0882)	
Father(Completed a GED)	-0.089	
	(0.0992)	
Father(Business,trade or vocational school after high school)	-0.106	
	(0.0910)	
Father(College, but did not graduate)	0.008	
	(0.0891)	
Father(Graduated from a college or university)	-0.002	
	(0.0898)	
Father(Professional training after a 4-year college or university)	0.086	

	(0.0915)	
Birth weight	-0.009	-0.006
	(0.0064)	(0.0056)
Constant	3.528***	3.695***
	(0.4563)	(0.6255)
Observations	9925	13260

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 11. Ordered Logistic Regression – Health Outcome of Adolescent

	(1) With father's background	(2) Without father's background
Being covered in the past 12 months	0.055	0.117**
	(0.0544)	(0.0441)
Household income of adolescents	0.000	0.001**
	(0.0004)	(0.0004)
Mother's employment status	-0.039	-0.044
	(0.0456)	(0.0394)
Father's employment status	0.164**	
	(0.0744)	
Adolescent(Hispanic)	-0.045	-0.065
	(0.0774)	(0.0644)
Adolescent(Non-Hispanic White)	0.039	-0.011
	(0.1034)	(0.0825)
Adolescent(African)	0.323**	0.246**
	(0.1117)	(0.0872)
Adolescent(Native)	-0.186*	-0.283**
	(0.1027)	(0.0875)
Adolescent(Asian)	-0.205*	-0.145
	(0.1217)	(0.1037)
Adolescent(Other)	0.108	0.109
	(0.1200)	(0.0979)
Female adolescent	-0.233***	-0.260***
	(0.0380)	(0.0328)
Age of adolescents	0.031**	0.028**
	(0.0112)	(0.0096)
How often eat vegitables	0.182***	0.164***
	(0.0247)	(0.0211)
Having enough sleep	0.378***	0.372***
	(0.0431)	(0.0369)
How often feel depressed	-0.318***	-0.310***
	(0.0268)	(0.0226)
Single parent factor	-0.234***	-0.136***
	(0.0697)	(0.0389)
Mother(Health:poor)	-0.423**	-0.501***
	(0.1498)	(0.1110)
Mother(Health:fair)	-0.369***	-0.516***
	(0.0788)	(0.0624)
Mother(Health:good)	-0.286***	-0.435***
	(0.0587)	(0.0464)
Mother(Health:very good)	-0.154**	-0.242***
	(0.0544)	(0.0445)
Father(Health:poor)	-0.288**	
	(0.1237)	
Father(Health:fair)	-0.278***	
	(0.0790)	
Father(Health:good)	-0.237***	
	(0.0604)	

Father(Health:very good)	-0.072	
	(0.0574)	
Mother(Never went to school)		0.818
		(0.8110)
Mother(8th grade or less)	-0.226*	-0.383***
	(0.1317)	(0.1003)
Mother(above 8th grade,not graduate from high school)	-0.214**	-0.324***
	(0.1004)	(0.0794)
Mother(Business,trade or vocational school)	0.014	-0.330*
	(0.2237)	(0.1926)
Mother(High school graduate)	-0.064	-0.216***
	(0.0803)	(0.0643)
Mother(Completed a GED)	-0.306**	-0.339***
	(0.1238)	(0.1015)
Mother(Business,trade or vocational school after high school)	-0.063	-0.192**
	(0.0902)	(0.0742)
Mother(College, but did not graduate)	-0.061	-0.194**
	(0.0790)	(0.0651)
Mother(Graduated from a college or university)	0.047	-0.052
	(0.0786)	(0.0676)
Father(Never went to school)	0.861	
	(1.1208)	
Father(8th grade or less)	-0.358**	
	(0.1184)	
Father(above 8th grade,not graduate from high school)	-0.314***	
	(0.0939)	
Father(Business,trade or vocational school)	-0.209	
	(0.1991)	
Father(High school graduate)	-0.231**	
	(0.0754)	
Father(Completed a GED)	-0.343**	
	(0.1235)	
Father(Business,trade or vocational school after high school)	-0.391***	
	(0.0874)	
Father(College, but did not graduate)	-0.147*	
	(0.0748)	
Father(Graduated from a college or university)	-0.174**	
	(0.0737)	
Father(Professional training after a 4-year college or university)		
Birth weight	-0.020	-0.013
	(0.0139)	(0.0119)
Observations	9925	13260

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 12. TSLS: The First Stage – Original Data

	Health Insurance Coverage of Adolescents
Ratio of having health insurance months in the community	0.4793***
	(0.0565)
Household income of adolescents	0.0006***
	(0.0001)
Mother(Never went to school)	
Mother(8th grade or less)	-0.1539***
	(0.0315)
Mother(above 8th grade,not graduate from high school)	-0.0776***
	(0.0208)
Mother(Business,trade or vocational school)	-0.0650
	(0.0476)
Mother(High school graduate)	-0.0095
	(0.0127)
Mother(Completed a GED)	-0.0975***
	(0.0275)
Mother(Business,trade or vocational school after high school)	-0.0142
	(0.0149)
Mother(College, but did not graduate)	-0.0140
	(0.0118)
Mother(Graduated from a college or university)	-0.0012
	(0.0113)
Mother(Professional training after a 4-year college or university)	
Father(Never went to school)	-0.7573***
	(0.0433)
Father(8th grade or less)	-0.1245***
	(0.0272)
Father(above 8th grade,not graduate from high school)	-0.1156***
	(0.0196)
Father(Business,trade or vocational school)	-0.0542
	(0.0452)
Father(High school graduate)	-0.0434***
	(0.0124)
Father(Completed a GED)	-0.0390
	(0.0241)
Father(Business,trade or vocational school after high school)	-0.0349**
	(0.0143)
Father(College, but did not graduate)	-0.0177
	(0.0109)
Father(Graduated from a college or university)	-0.0194**
	(0.0106)
Father(Professional training after a 4-year college or university)	
Mother(Health:poor)	-0.0488

	(0.0336)
Mother(Health:fair)	-0.0207
	(0.016)
Mother(Health:good)	-0.0122
	(0.0109)
Mother(Health:very good)	0.0012
	(0.0095)
Mother(Health:excellent)	
Father(Health:poor)	-0.1176***
	(0.03)
Father(Health:fair)	-0.0426***
	(0.0159)
Father(Health:good)	-0.0175
	(0.011)
Father(Health:very good)	0.0043
	(0.0098)
Father(Health:excellent)	
Father's employment status	0.0196
	(0.0173)
Mother's employment status	0.0296***
	(0.0096)
Mother(Hispanic)	-0.0481*
	(0.0257)
Mother(Non-Hispanic White)	0.0596*
	(0.0351)
Mother(African American)	0.0580
	(0.0486)
Mother(Indian American)	-0.0171
	(0.0287)
Mother(Asian American)	0.0003
	(0.0453)
Mother(Other Ethnic background)	0.0903**
	(0.0415)
Father(Hispanic)	-0.0233
	(0.0251)
Father(Non-Hispanic White)	-0.0136
	(0.0444)
Father(African American)	-0.0273
	(0.0532)
Father(Indian American)	-0.1019***
	(0.0379)
Father(Asian American)	-0.0490
	(0.0479)
Father(Other Ethnic background)	0.0170
	(0.0508)
Adolescent(Hispanic)	0.0103
	(0.0249)
Adolescent(Non-Hispanic White)	-0.0087
	(0.0256)

Adolescent(African)	0.0292
	(0.0393)
Adolescent(Native)	0.0100
	(0.0244)
Adolescent(Adolescent(Asian)	0.0452
	(0.0348)
Adolescent(Other)	-0.0234
	(0.0282)
Female adolescent	-0.0095
	(0.0072)
Age of adolescents	-0.0029
	(0.0022)
Birth weight	0.0011
	(0.0027)
How often eat vegitables	0.0011
	(0.0046)
Having enough sleep	0.0067
	(0.0081)
How often feel depressed	-0.0009
	(0.005)
Single parent Indicator	-0.0739***
	(0.0168)
Constant	0.4924***
	(0.1035)
Observations	9744

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

F(89, 8353) = 15.47

Table 13. TSLS: The Second Stage – Original Data

	Health Outcome of Adolescents
Being covered in the past 12 months	0.6048**
	(0.2464)
Mother(Never went to school)	
Mother(8th grade or less)	-0.0026
	(0.075)
Mother(above 8th grade,not graduate from high school)	-0.0469
	(0.0506)
Mother(Business,trade or vocational school)	-0.0012
	(0.1075)
Mother(High school graduate)	-0.0204
	(0.0387)
Mother(Completed a GED)	-0.0868
	(0.0676)
Mother(Business,trade or vocational school after high school)	-0.0196
	(0.0375)
Mother(College, but did not graduate)	-0.0159
	(0.0383)
Mother(Graduated from a college or university)	0.0263
	(0.0331)
Mother(Professional training after a 4-year college or university)	
Father(Never went to school)	0.8707***
	(0.2093)
Father(8th grade or less)	-0.1096
	(0.0768)
Father(above 8th grade,not graduate from high school)	-0.0839
	(0.0623)
Father(Business,trade or vocational school)	-0.0345
	(0.0992)
Father(High school graduate)	-0.0907**
	(0.0402)
Father(Completed a GED)	-0.1455**
	(0.0623)
Father(Business,trade or vocational school after high school)	-0.1643***
	(0.0425)
Father(College, but did not graduate)	-0.0643
	(0.0433)
Father(Graduated from a college or university)	-0.0742*
	(0.0384)
Father(Professional training after a 4-year college or university)	
Mother(Health:poor)	-0.1644**

	(0.0809)
Mother(Health:fair)	-0.1632***
	(0.0454)
Mother(Health:good)	-0.1142***
	(0.0258)
Mother(Health:very good)	-0.0610**
	(0.0247)
Mother(Health:excellent)	
Father(Health:poor)	-0.0598
	(0.0734)
Father(Health:fair)	-0.1015**
	(0.0409)
Father(Health:good)	-0.0913***
	(0.0271)
Father(Health:very good)	-0.0351
	(0.0235)
Father(Health:excellent)	
Father's employment status	0.0699*
	(0.0407)
Mother's employment status	-0.0354
	(0.0228)
Adolescent(Hispanic)	0.0061
	(0.0372)
Adolescent(Non-Hispanic White)	0.0072
	(0.0548)
Adolescent(African)	0.1134*
	(0.0581)
Adolescent(Native)	-0.0874
	(0.0566)
Adolescent(Asian)	-0.0794
	(0.0699)
Adolescent(Other)	0.0468
	(0.0544)
Female adolescent	-0.1003***
	(0.0247)
Age of adolescents	0.0159***
	(0.0058)
How often eat vegitables	0.0829***
	(0.0124)
Having enough sleep	0.1788***
	(0.0181)
How often feel depressed	-0.1554***
	(0.0139)
Single parent indicator	-0.0584
	(0.0419)
Constant	3.2042***
	(0.2956)
Observations	9744

Standard errors in parentheses ; $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$

Table 14. TSLS: The First Stage – Original Data, Excluding Father's Background

	Health Insurance Coverage of Adolescents
Ratio of having health insurance in the past 12 months in the community	0.5477***
	(0.0491)
Household income of adolescents	0.0006***
	(0.0001)
Mother(Never went to school)	-0.1810
	(0.2329)
Mother(8th grade or less)	-0.2449***
	(0.0235)
Mother(above 8th grade,not graduate from high school)	-0.1188***
	(0.0168)
Mother(Business,trade or vocational school)	-0.1468***
	(0.0482)
Mother(High school graduate)	-0.0581***
	(0.011)
Mother(Completed a GED)	-0.1480***
	(0.0236)
Mother(Business,trade or vocational school after high school)	-0.0582***
	(0.0133)
Mother(College, but did not graduate)	-0.0481***
	(0.0107)
Mother(Graduated from a college or university)	-0.0223**
	(0.0106)
Mother(Professional training after a 4-year college or university)	
Mother(Health:poor)	-0.0586
	(0.0262)
Mother(Health:fair)	-0.0558***
	(0.0138)
Mother(Health:good)	-0.0317***
	(0.0091)
Mother(Health:very good)	-0.0002
	(0.0082)
Mother(Health:excellent)	
Mother's employment status	0.0151*
	(0.0088)
Mother(Hispanic)	-0.0536**
	(0.0213)
Mother(Non-Hispanic White)	0.0626**
	(0.0295)
Mother(African American)	0.0631*
	(0.0376)
Mother(Indian American)	0.0055
	(0.0243)

Mother(Asian American)	-0.0343
	(0.0402)
Mother(Other Ethnic background)	0.0952***
	(0.0332)
Adolescent(Hispanic)	0.0076
	(0.0191)
Adolescent(Non-Hispanic White)	-0.0204
	(0.022)
Adolescent(African)	0.0035
	(0.027)
Adolescent(Native)	-0.0219
	(0.0209)
Adolescent(Asian)	0.0367
	(0.0333)
Adolescent(Other)	-0.0337
	(0.0245)
Female adolescent	-0.0092
	(0.0066)
Age of adolescents	-0.0060***
	(0.002)
Birth weight	0.0025
	(0.0025)
How often eat vegitables	0.0052
	(0.0042)
Having enough sleep	-0.0005
	(0.0073)
How often feel depressed	-0.0012
	(0.0045)
Single parent indicator	-0.0471***
	(0.0089)
Constant	0.3976***
	(0.078)
Observations	13116

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

F(70, 11239) = 20.46

Table 15. TSLS: The Second Stage – Original dataset, excluding Father's Background

	Health Outcome of Adolescents
Being covered in the past 12 months	0.4193*
	(0.2304)
Mother(Never went to school)	0.4851
	(0.4588)
Mother(8th grade or less)	-0.0843
	(0.0819)
Mother(above 8th grade,not graduate from high school)	-0.0996**
	(0.0504)
Mother(Business,trade or vocational school)	-0.1297
	(0.1026)
Mother(High school graduate)	-0.0772**
	(0.0359)
Mother(Completed a GED)	-0.1062
	(0.0649)
Mother(Business,trade or vocational school after high school)	-0.0640*
	(0.0354)
Mother(College, but did not graduate)	-0.0633*
	(0.0336)
Mother(Graduated from a college or university)	-0.0131
	(0.0294)
Mother(Professional training after a 4-year college or university)	
Mother(Health:poor)	-0.2169***
	(0.0576)
Mother(Health:fair)	-0.2272***
	(0.031)
Mother(Health:good)	-0.1808***
	(0.0229)
Mother(Health:very good)	-0.1017***
	(0.0183)
Mother(Health:excellent)	
Mother's employment status	-0.0238
	(0.0186)
Adolescent(Hispanic)	-0.0135
	(0.0319)
Adolescent(Non-Hispanic White)	-0.0035
	(0.0391)
Adolescent(African)	0.0975**
	(0.0412)
Adolescent(Native)	-0.1282***
	(0.0468)
Adolescent(Asian)	-0.0524
	(0.0583)

Adolescent(Other)	0.0577
	(0.0459)
Female adolescent	-0.1147***
	(0.0216)
Age of adolescents	0.0157***
	(0.0055)
Birth weight	-0.0063
	(0.0058)
How often eat vegitables	0.0749***
	(0.0101)
Having enough sleep	0.1818***
	(0.0167)
How often feel depressed	-0.1528***
	(0.0124)
Single parent indicator	-0.0458*
	(0.0252)
Constant	3.4080***
	(0.2592)
Observations	11310

Standard errors in parentheses

$* p < 0.10, * p < 0.05, *** p < 0.01$

Table 16. Summary Statistics

Variable	Mean	Std. Dev.	N
Outcome variables			
Health status of young adult	3.83	0.913	26066
Education of young adult	4.23	1.201	26056
Personal earnings of young adult	24596.706	36751.506	23982
Adolescents' characteristics			
Health insurance status of adolescents	0.881	0.324	22554
Household income of adolescents	46.967	51.182	19970
Health status of adolescents	3.876	0.913	26058
Female adolescent	0.543	0.498	26068
Male adolescent	0.457	0.498	26068
Age of adolescents	16.104	1.743	26068
How often eat vegetables	0.96	0.781	26044
Have enough sleep or not	0.712	0.453	26042
Mother(Hispanic)	0.136	0.342	21372
Mother(Non-Hispanic White)	0.682	0.466	21402
Mother(African American)	0.207	0.405	21402
Mother(Indian American)	0.029	0.168	21402
Mother(Asian American)	0.057	0.232	21402
Mother(Other Ethnic background)	0.054	0.225	21402
Father(Hispanic)	0.128	0.334	16888
Father(Non-Hispanic White)	0.728	0.445	16966
Father(African American)	0.161	0.368	16966
Father(Indian American)	0.019	0.138	16966
Father(Asian American)	0.056	0.23	16966
Father(Other Ethnic background)	0.055	0.227	16966
Mother's health status	3.588	1.035	21472
Father's health status	3.552	1.028	16946
Mother's education	5.512	2.374	21384
Father's education	5.609	2.456	16856
Mother's employment status	0.735	0.441	21470
Father's employment status	0.902	0.297	16986
Single parent indicator	0.276	0.447	22660
Young adults' characteristics			
Young adult(Hispanic)	0.157	0.364	26022
Young adult(Non-Hispanic White)	0.684	0.465	25752
Young adult(African)	0.227	0.419	26000
Young adult(Indian)	0.053	0.225	26002
Young adult(Asian)	0.076	0.265	25988
Age of young adult	25.489	3.978	26068
Male young adult	0.456	0.498	26068
Smoking	1.179	0.857	22487
Currently in school	0.274	0.446	26052
Average yearly working experience between 1995-2001	0.788	0.242	25036

Table 17. Summary Statistics By Coverage

	(1) Not Covered	(2) Covered	(3) Difference
Health status of young adult	3.747	3.848	-0.101***
	(0.937]	(0.905)	[-5.42]
Education of young adult	3.815	4.300	-0.485***
	(1.243)	(1.180)	[-19.86]
Personal earnings of young adult	21269.4	24737.7	-3468.4***
	(21847.4)	(36951.2)	[-4.52]
Young adult(Hispanic)	0.323	0.128	0.195***
	(0.468)	(0.334)	[26.87]
Young adult(Non-Hispanic White)	0.679	0.709	-0.0294**
	(0.467)	(0.454)	[-3.11]
Young adult(African)	0.226	0.220	0.00585
	(0.418)	(0.414)	[0.68]
Young adult(Indian)	0.0704	0.0496	0.0207***
	(0.256)	(0.217)	[4.53]
Young adult(Asian)	0.0510	0.0659	-0.0149**
	(0.220)	(0.248)	[-2.95]
Female young adults	0.566	0.538	0.0277**
	(0.496)	(0.499)	[2.70]
Age of young adult	25.75	25.33	0.416***
	(3.986)	(3.963)	[5.11]
Smoking	1.111	1.196	-0.0844***
	(0.884)	(0.851)	[-4.43]
Currently in school	0.211	0.286	-0.0757***
	(0.408)	(0.452)	[-8.24]
Average yearly working experience between 1995-2001	0.788	0.783	0.00459
	(0.239)	(0.244)	[0.90]
Health status of adolescents	3.781	3.902	-0.121***
	(0.937)	(0.900)	[-6.50]
Household income of adolescents	25.34	50.00	-24.66***
	(41.70)	(51.40)	[-21.84]
Mother's employment status	0.612	0.754	-0.142***
	(0.487)	(0.431)	[-15.16]
Father's employment status	0.815	0.913	-0.0976***
	(0.388)	(0.282)	[-13.22]
Mother's education	4.049	5.727	-1.678***
	(2.382)	(2.296)	[-33.84]
Father's education	3.872	5.827	-1.954***
	(2.445)	(2.374)	[-32.50]
Mother's health status	3.217	3.643	-0.426***
	(1.097)	(1.015)	[-19.38]
Father's health status	3.151	3.600	-0.449***
	(1.163)	(0.999)	[-17.60]
Observations	2686	19868	22554

mean coefficients; sd in parentheses; t statistics in []

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 18. Summary Statistics – By Health Insurance Type

	(1) None	(2) MEDICARE	(3) MEDICAID	(4) Private	(5) Prepaid	(6) Other
Health status of young adult	3.747	3.693	3.655	3.893	3.833	3.807
	(0.937)	(0.918)	(0.996)	(0.886)	(0.898)	(0.938)
Education of young adult	3.815	3.573	3.424	4.415	4.413	4.093
	(1.243)	(1.221)	(1.246)	(1.125)	(1.117)	(1.257)
Personal earnings of young adult	21269.4	19620.3	17707.0	25303.7	26099.8	23486.1
	(21847.4)	(19192.6)	(37682.9)	(37326.5)	(37532.1)	(27858.3)
Young adult(Hispanic)	0.323	0.188	0.183	0.0962	0.159	0.204
	(0.468)	(0.391)	(0.387)	(0.295)	(0.366)	(0.403)
Young adult(Non-Hispanic White)	0.679	0.419	0.494	0.757	0.704	0.620
	(0.467)	(0.495)	(0.500)	(0.429)	(0.457)	(0.486)
Young adult(African)	0.226	0.469	0.442	0.190	0.202	0.214
	(0.418)	(0.500)	(0.497)	(0.392)	(0.401)	(0.411)
Young adult(Indian)	0.0704	0.0737	0.0702	0.0386	0.0507	0.129
	(0.256)	(0.262)	(0.255)	(0.193)	(0.219)	(0.335)
Young adult(Asian)	0.0510	0.0947	0.0223	0.0489	0.110	0.0898
	(0.220)	(0.294)	(0.148)	(0.216)	(0.313)	(0.286)
Female young adult	0.566	0.490	0.602	0.532	0.523	0.587
	(0.496)	(0.501)	(0.490)	(0.499)	(0.500)	(0.493)
Age of young adult	25.75	25.66	25.29	25.31	25.37	25.35
	(3.986)	(4.006)	(3.962)	(3.966)	(3.954)	(3.962)
Smoking	1.111	0.994	1.213	1.216	1.169	1.125
	(0.884)	(0.889)	(0.877)	(0.844)	(0.848)	(0.872)
Currently in school	0.211	0.177	0.170	0.301	0.303	0.258
	(0.408)	(0.383)	(0.376)	(0.459)	(0.460)	(0.438)
Average yearly working experience between 1995-2001	0.788	0.796	0.738	0.787	0.794	0.762
	(0.239)	(0.251)	(0.260)	(0.244)	(0.236)	(0.252)
Health status of adolescents	3.781	3.705	3.695	3.943	3.894	3.884
	(0.937)	(1.048)	(1.005)	(0.878)	(0.889)	(0.909)
Household income of adolescents	25.34	22.82	15.33	54.25	54.28	39.67

	(41.70)	(48.88)	(21.85)	(55.56)	(41.93)	(62.52)
Mother's employment status	0.612	0.372	0.354	0.792	0.828	0.703
	(0.487)	(0.485)	(0.478)	(0.406)	(0.378)	(0.457)
Father's employment status	0.815	0.528	0.634	0.940	0.931	0.862
	(0.388)	(0.502)	(0.482)	(0.238)	(0.254)	(0.346)
Mother's education	4.049	3.847	3.783	5.938	6.092	5.083
	(2.382)	(2.279)	(2.192)	(2.189)	(2.172)	(2.367)
Father's education	3.872	3.519	3.735	5.947	6.145	5.189
	(2.445)	(2.441)	(2.193)	(2.309)	(2.263)	(2.530)
Mother's health status	3.217	2.828	2.899	3.734	3.748	3.504
	(1.097)	(1.099)	(1.143)	(0.965)	(0.963)	(0.967)
Father's health status	3.151	2.453	2.940	3.651	3.682	3.425
	(1.163)	(1.212)	(1.156)	(0.958)	(0.989)	(0.897)
Observations	2686	192	1810	11352	5530	984

mean coefficients; sd in parentheses

$*\ p < 0.10, **\ p < 0.05, ***\ p < 0.01$

Table 19. Summary Statistics – Multiple Imputation

	(1) Not Covered	(2) Covered	(3) Difference
Health status of young adult	3.763	3.842	-0.0792***
	(0.933)	(0.908)	(-8.75)
Education of young adult	3.907	4.288	-0.381***
	(1.240)	(1.184)	(-32.17)
Personal earnings of young adult	22912.9	24894.5	-1981.6***
	(34199.4)	(37176.4)	(-5.17)
Young adult(Hispanic)	0.281	0.135	0.146***
	(0.450)	(0.341)	(40.99)
Young adult(Non-Hispanic White)	0.647	0.694	-0.0471***
	(0.478)	(0.461)	(-10.25)
Young adult(African)	0.242	0.224	0.0180***
	(0.429)	(0.417)	(4.33)
Young adult(Indian)	0.0680	0.0512	0.0168***
	(0.252)	(0.220)	(7.51)
Young adult(Asian)	0.0760	0.0765	-0.000491
	(0.265)	(0.266)	(-0.19)
Female young adult	0.552	0.542	0.0104*
	(0.497)	(0.498)	(2.11)
Age of young adult	25.90	25.41	0.484***
	(3.983)	(3.973)	(12.28)
Smoking	1.127	1.196	-0.0689***
	(0.873)	(0.849)	(-8.15)
Currently in school	0.217	0.284	-0.0676***
	(0.412)	(0.451)	(-15.30)
Average yearly working experience between 1995-2001	0.796	0.786	0.00994***
	(0.238)	(0.243)	(4.14)
Health status of adolescents	3.787	3.893	-0.106***
	(0.952)	(0.905)	(-11.72)
Household income of adolescents	29.67	48.31	-18.64***
	(47.63)	(51.32)	(-37.01)
Mother's employment status	0.633	0.746	-0.113***
	(0.482)	(0.435)	(-25.74)
Father's employment status	0.849	0.886	-0.0374***
	(0.358)	(0.317)	(-11.62)
Mother's education	5.543	6.778	-1.649
	(2.512)	(2.297)	(-60.16)
Father's education	5.931	6.931	-1.874
	(2.674)	(2.364)	(-56.09)
Mother's health status	3.240	3.614	-0.374***
	(1.100)	(1.025)	(-36.36)
Father's health status	3.336	3.543	-0.208***
	(1.102)	(1.034)	(-20.04)
Observations	12000	66204	78204

mean coefficients; sd in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 20. OLS Regression: Outcomes of Young Adults

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	0.021	0.1439***	1648.37**
	(0.0189)	(0.0249)	(644.368)
Household income of adolescents	0.0002**	0.0015***	17.1688**
	(0.0001)	(0.0002)	(7.4216)
Mother's employment status	-0.022	0.0763***	800.222*
	(0.0153)	(0.0196)	(478.307)
Father's employment status	0.029	0.0206	-1209.3
	(0.0233)	(0.0294)	(1108.73)
Mother(Never went to school)	0.108	-0.3099	-4921.93
	(0.1324)	(0.2386)	(3564.41)
Mother(8th grade or less)	-0.050	-0.1945***	1755.83
	(0.0351)	(0.0455)	(1699.92)
Mother(above 8th grade,not graduate from high school)	-0.052*	-0.3759***	-2061.52**
	(0.0267)	(0.0368)	(968.395)
Mother(Business,trade or vocational school)	-0.112	-0.2663***	-793.141
	(0.0757)	(0.0957)	(1977.59)
Mother(High school graduate)	-0.025	-0.0587**	46.2355
	(0.0204)	(0.0277)	(843.142)
Mother(Completed a GED)	-0.100***	-0.3224***	-1127.34
	(0.0383)	(0.0484)	(1170.86)
Mother(Business,trade or vocational school after high school)	-0.041	0.0476	-332.312
	(0.0256)	(0.0337)	(879.315)
Mother(College, but did not graduate)	0.011	0.0537*	387.495
	(0.0215)	(0.0284)	(827.238)
Mother(Graduated from a college or university)	-0.001	0.2039***	977.901
	(0.0233)	(0.0297)	(972.074)
Mother(Professional training after a 4-year college or university)	0.086***	0.3266***	2001.41**
	(0.0261)	(0.0324)	(987.839)
Father(Never went to school)	-0.362**	-0.2270	-3448.9
	(0.1749)	(0.4296)	(4810.95)
Father(8th grade or less)	-0.050	-0.1273***	-43.0729
	(0.0307)	(0.0382)	(1525.61)
Father(above 8th grade,not graduate from high school)	-0.013	-0.2128***	-1263.9
	(0.0242)	(0.0319)	(808.715)
Father(Business,trade or vocational school)	-0.117	-0.2412***	560.282
	(0.0714)	(0.0804)	(1752.48)
Father(High school graduate)	-0.032*	-0.1128***	-1286.79**

	(0.0167)	(0.022)	(513.608)
Father(Completed a GED)	-0.115***	-0.1677***	196.871
	(0.0364)	(0.0461)	(1633.88)
Father(Business,trade or vocational school after high school)	-0.035	-0.0154	-876.473
	(0.0234)	(0.0294)	(655.029)
Father(College, but did not graduate)	-0.024	0.0448*	-654.041
	(0.019)	(0.0237)	(585.814)
Father(Graduated from a college or university)	0.020	0.1237***	284.245
	(0.0195)	(0.0233)	(644.56)
Father(Professional training after a 4-year college or university)	0.022	0.1215***	-88.0699
	(0.0212)	(0.0262)	(714.642)
Mother(Health:poor)			
Mother(Health:fair)	0.002	0.0184	-869.89
	(0.0434)	(0.055)	(1576.19)
Mother(Health:good)	0.056	0.0895*	451.254
	(0.0409)	(0.0521)	(1492.69)
Mother(Health:very good)	0.099**	0.1253**	1249.36
	(0.0412)	(0.0525)	(1506.59)
Mother(Health:excellent)	0.193***	0.1499***	1983.61
	(0.042)	(0.0536)	(1588.1)
Father(Health:poor)			
Father(Health:fair)	0.006	0.0034	622.558
	(0.0395)	(0.0493)	(1620.53)
Father(Health:good)	0.020	0.0357	1812.18
	(0.038)	(0.0472)	(1643.88)
Father(Health:very good)	0.055	0.0593	1922.78
	(0.0384)	(0.0478)	(1689.95)
Father(Health:excellent)	0.067*	0.0948*	1378.9
	(0.0398)	(0.0496)	(1811.17)
Young adult (Hispanic)	-0.077***	-0.0747***	166.433
	(0.0217)	(0.0268)	(843.898)
Young adult (Non-Hispanic White)	0.048	0.0247	-505.059
	(0.0348)	(0.0462)	(1066.78)
Young adult (African)	-0.024	-0.0053	-2102.9*
	(0.0369)	(0.0481)	(1163.51)
Young adult (Native)	-0.069**	-0.1676***	-3266.19***
	(0.0327)	(0.0433)	(1017.12)
Young adult (Asian)	-0.030	0.1997***	2424.35*
	(0.0396)	(0.0506)	(1391.19)
Female young adult	-0.138***	0.1958***	-7589.36***
	(0.0128)	(0.0159)	(467.81)
Age of young adults	0.002	0.0556***	1222.17***
	(0.0036)	(0.0046)	(140.066)
Smoking	-0.141***		
	(0.0086)		
Currently in school		0.8093***	

		(0.0145)	
Average working experience			11225.9***
			(1098.96)
In Wave 4	-0.401***	0.2807***	13881.7***
	(0.0274)	(0.0338)	(1048.83)
Single parent Indicator	-0.023	-0.1499***	-520.046
	(0.0153)	(0.0193)	(560.083)
Constant	3.794 ***	2.637 ***	-47932.7***
	(0.1197)	(0.1493)	(4429.06)
Observations	26066	26056	23982

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 21. Ordered Logistic Regression: Outcomes of Young Adults

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	0.043	0.272***	0.026
	(0.0397)	(0.0444)	(0.0315)
Household income of adolescents	0.001**	0.003***	0.000
	(0.0003)	(0.0004)	(0.0002)
Mother's employment status	-0.048	0.128***	0.026
	(0.0321)	(0.0361)	(0.0259)
Father's employment status	0.064	0.030	0.024
	(0.0493)	(0.0543)	(0.0406)
Mother(Never went to school)	0.222	-0.536	0.113
	(0.3145)	(0.3979)	(0.3505)
Mother(8th grade or less)	-0.099	-0.361***	-0.022
	(0.0751)	(0.0825)	(0.0531)
Mother(>8th grade,not graduate from high school)	-0.110*	-0.675***	-0.078*
	(0.0566)	(0.0673)	(0.0447)
Mother(Business,trade or vocational school)	-0.266	-0.494***	-0.019
	(0.1604)	(0.1677)	(0.1111)
Mother(High school graduate)	-0.060	-0.144***	-0.003
	(0.0432)	(0.0534)	(0.0324)
Mother(Completed a GED)	-0.197**	-0.572***	-0.061
	(0.0795)	(0.085)	(0.061)
Mother(Business,trade or vocational school after high school)	-0.101	0.064	-0.001
	(0.0533)	(0.0652)	(0.04)
Mother(College, but did not graduate)	0.020	0.064	-0.010
	(0.0458)	(0.0554)	(0.0344)
Mother(Graduated from a college or university)	-0.004	0.416***	-0.004
	(0.0494)	(0.0611)	(0.0376)
Mother(Professional training after a 4-year college or university)	0.174***	0.736***	0.000
	(0.0555)	(0.0694)	(0.0446)
Father(Never went to school)	-0.821**	-0.560	0.089
	(0.3889)	(0.7978)	(0.4339)
Father(8th grade or less)	-0.108	-0.220***	0.018
	(0.0656)	(0.0683)	(0.0487)
Father(>8th grade,not graduate from high school)	-0.035	-0.403***	-0.004
	(0.0508)	(0.0568)	(0.0407)
Father(Business,trade or vocational school)	-0.227	-0.466***	0.222**
	(0.1474)	(0.1413)	(0.1023)
Father(High school graduate)	-0.073**	-0.225***	-0.005
	(0.0353)	(0.041)	(0.0281)
Father(Completed a GED)	-0.244***	-0.324***	-0.065

	(0.0774)	(0.0802)	(0.0621)
Father(Business,trade or vocational school after high school)	-0.074	-0.051	-0.025
	(0.0493)	(0.0555)	(0.0377)
Father(College, but did not graduate)	-0.048	0.066	0.033
	(0.0402)	(0.0451)	(0.0315)
Father(Graduated from a college or university)	0.049	0.264***	0.016
	(0.0414)	(0.0467)	(0.0329)
Father(Professional training after a 4-year college or university)	0.059	0.313***	-0.045
	(0.0451)	(0.0534)	(0.036)
Mother(Health:poor)	-0.400***	-0.282***	-0.144**
	(0.0863)	(0.0973)	(0.0674)
Mother(Health:fair)	-0.413***	-0.257***	-0.150***
	(0.0536)	(0.059)	(0.0416)
Mother(Health:good)	-0.305***	-0.134***	-0.051
	(0.0397)	(0.045)	(0.0318)
Mother(Health:very good)	-0.211***	-0.058	-0.028
	(0.0388)	(0.0434)	(0.0308)
Mother(Health:excellent)			
Father(Health:poor)	-0.1242326	-0.168*	-0.059
	(0.0838)	(0.0916)	(0.0663)
Father(Health:fair)	-0.115**	-0.142**	-0.010
	(0.0541)	(0.06)	(0.0427)
Father(Health:good)	-0.086**	-0.092**	0.002
	(0.0406)	(0.0456)	(0.0325)
Father(Health:very good)	-0.019	-0.050	-0.033
	(0.0391)	(0.0441)	(0.0314)
Father(Health:excellent)			
Young adult(Hispanic)	-0.152***	-0.140***	0.052
	(0.0456)	(0.0496)	(0.0346)
Young adult(Non-Hispanic White)	0.096	0.004	-0.068
	(0.0734)	(0.084)	(0.0589)
Young adult(African)	-0.052	-0.027	-0.095
	(0.078)	(0.0877)	(0.0626)
Young adult(Native)	-0.147**	-0.296***	-0.200***
	(0.0686)	(0.0766)	(0.0546)
Young adult(Asian)	-0.066	0.353***	0.111
	(0.0839)	(0.0959)	(0.0676)
Female young adult	-0.287***	0.391***	-0.427***
	(0.027)	(0.0302)	(0.0215)
Age of young adults	0.004	0.109***	0.139***
	(0.0077)	(0.0086)	(0.0072)
Smoking	-0.302***		
	(0.0155)		
Currently in school		1.558***	
		(0.032)	
Average working experience			0.080

			(0.0615)
In Wave 4	-0.836***	0.519***	0.216***
	(0.0576)	(0.0638)	(0.0566)
Single parent Indicator	-0.049	-0.285***	-0.075***
	(0.0323)	(0.0358)	(0.0251)
Observations	26066	26056	26068

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 22. Marginal Effects: Health and Education Outcomes of Young Adults

	Health insurance of adolescents
Young adult (Never went to school)	-0.0007***
	(0.0001)
Young adult (8th grade or less)	-0.015***
	(0.002)
Young adult (above 8th grade,not graduate from high school)	-0.042***
	(0.007)
Young adult (Business,trade or vocational school)	-0.005***
	(0.0007)
Young adult (High school graduate)	0.054***
	(0.009)
Young adult (Completed a GED)	0.009***
	(0.001)
Observations	26066
Young adult (Health:poor)	-0.0002
	(0.0002)
Young adult (Health:fair)	-0.002
	(0.002)
Young adult (Health:good)	-0.007
	(0.006)
Young adult (Health:very good)	0.001
	(0.001)
Young adult (Health:excellent)	0.007
	(0.007)
Observations	26056

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 23. Hausman Test: Health Outcome of Young Adults

	(1) Health insurance status of adolescents	(2) Health status of young adults
Health insurance status of adolescents		0.785***
		(0.1524)
Ratio of having health insurance in the community	0.5125***	
	(0.0549)	
Residual		-0.776***
		(0.1536)
Age of adolescents	-0.0073	
	(0.0064)	
Household income of adolescents	0.0004***	0.000
	(0.0001)	(0.0001)
Father(Hispanic)	0.0101	
	(0.0186)	
Father(Non-Hispanic White)	0.0121	
	(0.0215)	
Father(African American)	0.0483*	
	(0.0247)	
Father(Indian American)	-0.0896***	
	(0.024)	
Father(Asian American)	-0.0066	
	(0.0238)	
Father(Other Ethnic background)	0.0108	
	(0.0242)	
Mother(Hispanic)	-0.0550***	
	(0.0192)	
Mother(Non-Hispanic White)	0.0008	
	(0.0241)	
Mother(African American)	-0.0014	
	(0.0312)	
Mother(Indian American)	-0.0479**	
	(0.0217)	
Mother(Asian American)	-0.0669**	
	(0.0279)	
Mother(Other Ethnic background)	-0.0326	
	(0.027)	
Mother(Never went to school)	-0.1797	0.276**
	(0.1244)	(0.1347)
Mother(8th grade or less)	-0.1090***	0.037
	(0.0201)	(0.0392)
Mother(above 8th grade,not graduate from high school)	-0.0228	-0.034
	(0.0151)	(0.027)
Mother(Business,trade or vocational school)	0.0015	-0.106
	(0.0391)	(0.0754)
Mother(High school graduate)	0.0030	-0.031
	(0.0111)	(0.0204)

Mother(Completed a GED)	-0.0285	-0.080**
	(0.0203)	(0.0384)
Mother(Business,trade or vocational school after high school)	0.0080	-0.052**
	(0.013)	(0.0257)
Mother(College, but did not graduate)	0.0338***	-0.019
	(0.0112)	(0.0223)
Mother(Graduated from a college or university)	0.0331***	-0.032
	(0.0115)	(0.024)
Mother(Professional training after a 4-year college or university)	0.0357***	0.048*
	(0.0127)	(0.0271)
Father(Never went to school)	-0.0344	-0.324**
	(0.2005)	(0.1628)
Father(8th grade or less)	-0.0322*	-0.020
	(0.017)	(0.0312)
Father(above 8th grade,not graduate from high school)	-0.0434***	0.023
	(0.0132)	(0.0253)
Father(Business,trade or vocational school)	-0.0545	-0.069
	(0.0368)	(0.0719)
Father(High school graduate)	0.0086	-0.038**
	(0.0087)	(0.0167)
Father(Completed a GED)	0.0175	-0.128***
	(0.0177)	(0.0364)
Father(Business,trade or vocational school after high school)	-0.0009	-0.034
	(0.0112)	(0.0234)
Father(College, but did not graduate)	0.0196**	-0.041**
	(0.009)	(0.0193)
Father(Graduated from a college or university)	0.0101	0.010
	(0.0093)	(0.0196)
Father(Professional training after a 4-year college or university)	0.0051	0.014
	(0.0102)	(0.0212)
Mother(Health:poor)		
Mother(Health:fair)	0.0024	0.000
	(0.0234)	(0.0433)
Mother(Health:good)	0.0219	0.035
	(0.0221)	(0.041)
Mother(Health:very good)	0.0539**	0.050
	(0.022)	(0.0422)
Mother(Health:excellent)	0.0370*	0.156***
	(0.0225)	(0.0426)
Father(Health:poor)		
Father(Health:fair)	0.0337	-0.019
	(0.0207)	(0.0398)
Father(Health:good)	0.0420**	-0.011

	(0.0199)	(0.0384)
Father(Health:very good)	0.0396**	0.024
	(0.0201)	(0.0387)
Father(Health:excellent)	0.0384*	0.038
	(0.0207)	(0.04)
Mother's employment status	0.0232***	-0.041***
	(0.0079)	(0.0157)
Father's employment status	-0.0184	0.043*
	(0.012)	(0.0233)
Young adult(Hispanic)	-0.0001**	-0.022
	(0.0188)	(0.0244)
Young adult(Non-Hispanic White)	-0.0040	0.035
	(0.0182)	(0.035)
Young adult(African)	-0.0108	-0.052
	(0.0257)	(0.0373)
Young adult(Native)	0.0379**	-0.090***
	(0.0165)	(0.0328)
Young adult(Asian)	0.0368	-0.017
	(0.0239)	(0.0398)
Female young adult	-0.0043	-0.132***
	(0.0061)	(0.0128)
Age of young adults	-0.0071	0.014***
	(0.0063)	(0.0044)
Smoking	0.0014	-0.143***
	(0.0034)	(0.0091)
Birth weight	0.0037*	
	(0.0022)	
Health status of adolescent	0.0044	
	(0.0035)	
In Wave 4	0.0513	-0.488***
	(0.045)	(0.0325)
Single parent Indicator	-0.0521***	0.020
	(0.0079)	(0.0175)
Constant	0.5335***	3.728***
	(0.0897)	(0.2053)
Observations	26068	26066

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 24. Hausman Test: Education Outcome of Young Adults

	(1) Health insurance status of adolescents	(2) Education of young adults
Health insurance status of adolescents		1.408***
		(0.1897)
Ratio of having health insurance in the community	0.5119***	
	(0.0549)	
Residual		-1.284***
		(0.1914)
Age of adolescents	-0.0072	
	(0.0064)	
Household income of adolescents	0.0004***	0.001***
	(0.0001)	(0.0002)
Father(Hispanic)	0.0097	
	(0.0186)	
Father(Non-Hispanic White)	0.0123	
	(0.0215)	
Father(African American)	0.0482*	
	(0.0247)	
Father(Indian American)	-0.0891***	
	(0.024)	
Father(Asian American)	-0.0066	
	(0.0238)	
Father(Other Ethnic background)	0.0109	
	(0.0241)	
Mother(Hispanic)	-0.0555***	
	(0.0192)	
Mother(Non-Hispanic White)	0.0008	
	(0.0241)	
Mother(African American)	-0.0014	
	(0.0312)	
Mother(Indian American)	-0.0480**	
	(0.0217)	
Mother(Asian American)	-0.0669**	
	(0.0279)	
Mother(Other Ethnic background)	-0.0323	
	(0.027)	
Mother(Never went to school)	-0.1798	-0.032
	(0.1244)	(0.2418)
Mother(8th grade or less)	-0.1087***	-0.050
	(0.0201)	(0.0507)
Mother(above 8th grade,not graduate from high school)	-0.0220	-0.346***
	(0.0151)	(0.0371)
Mother(Business,trade or vocational school)	0.0021	-0.258***
	(0.0391)	(0.0946)
Mother(High school graduate)	0.0032	-0.069**
	(0.0111)	(0.0277)

Mother(Completed a GED)	-0.0277	-0.290***
	(0.0203)	(0.0487)
Mother(Business,trade or vocational school after high school)	0.0081	0.029
	(0.013)	(0.0338)
Mother(College, but did not graduate)	0.0337***	0.004
	(0.0112)	(0.0294)
Mother(Graduated from a college or university)	0.0324***	0.154***
	(0.0115)	(0.0306)
Mother(Professional training after a 4-year college or university)	0.0347***	0.266***
	(0.0127)	(0.0335)
Father(Never went to school)	-0.0336	-0.166
	(0.2008)	(0.4439)
Father(8th grade or less)	-0.0321*	-0.078**
	(0.017)	(0.0388)
Father(above 8th grade,not graduate from high school)	-0.0430***	-0.154***
	(0.0132)	(0.0327)
Father(Business,trade or vocational school)	-0.0546	-0.161**
	(0.0368)	(0.0814)
Father(High school graduate)	0.0088	-0.122***
	(0.0087)	(0.022)
Father(Completed a GED)	0.0180	-0.189***
	(0.0177)	(0.0462)
Father(Business,trade or vocational school after high school)	-0.0010	-0.014
	(0.0112)	(0.0293)
Father(College, but did not graduate)	0.0195**	0.017
	(0.009)	(0.024)
Father(Graduated from a college or university)	0.0098	0.109***
	(0.0093)	(0.0234)
Father(Professional training after a 4-year college or university)	0.0048	0.110***
	(0.0102)	(0.0261)
Mother(Health:poor)		
Mother(Health:fair)	0.0025	0.014
	(0.0234)	(0.055)
Mother(Health:good)	0.0217	0.054
	(0.0221)	(0.0523)
Mother(Health:very good)	0.0537**	0.045
	(0.0221)	(0.0539)
Mother(Health:excellent)	0.0367	0.088
	(0.0225)	(0.0543)
Father(Health:poor)		
Father(Health:fair)	0.0333	-0.037
	(0.0207)	(0.0496)
Father(Health:good)	0.0417**	-0.015

	(0.0199)	(0.0479)
Father(Health:very good)	0.0392*	0.010
	(0.0201)	(0.0484)
Father(Health:excellent)	0.0381*	0.047
	(0.0207)	(0.0502)
Mother's employment status	0.0231***	0.045**
	(0.0079)	(0.0201)
Father's employment status	-0.0183	0.043
	(0.012)	(0.0296)
Young adult(Hispanic)	-0.0001	0.017
	(0.0188)	(0.0299)
Young adult(Non-Hispanic White)	-0.0035	0.002
	(0.0182)	(0.0465)
Young adult(African)	-0.0112	-0.051
	(0.0257)	(0.0488)
Young adult(Native)	0.0383**	-0.203***
	(0.0165)	(0.0435)
Young adult(Asian)	0.0366	0.221***
	(0.0239)	(0.0507)
Female adult	-0.0051	0.206***
	(0.0061)	(0.0159)
Age of young adults	-0.0067	0.075***
	(0.0063)	(0.0054)
Currently in school	0.0105**	0.794***
	(0.0051)	(0.0146)
Birth weight	0.0037*	
	(0.0022)	
Health status of adolescent	0.0040	
	(0.0035)	
In Wave 4	0.0503	0.138***
	(0.045)	(0.0399)
Single parent Indicator	-0.0516***	-0.081***
	(0.0079)	(0.0218)
Constant	0.5289***	1.243***
	(0.0897)	(0.2521)
Observations	26068	26056

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 25. Hausman Test: Personal Earnings of Young Adults

	(1) Health insurance status of adolescents	(2) Personal earnings of young adults
Health insurance status of adolescents		16946.9***
		(5074.87)
Ratio of having health insurance in the community	0.5114***	
	(0.0549)	
Residual		-15538.5***
		(5108.65)
Age of adolescents	-0.0078	
	(0.0065)	
Household income of adolescents	0.0004***	10.4
	(0.0001)	(7.4602)
Father(Hispanic)	0.0104	
	(0.0187)	
Father(Non-Hispanic White)	0.0115	
	(0.0215)	
Father(African American)	0.0477*	
	(0.0247)	
Father(Native American)	-0.0898***	
	(0.024)	
Father(Asian American)	-0.0068	
	(0.0238)	
Father(Other Ethnic background)	0.0103	
	(0.0242)	
Mother(Hispanic)	-0.0553***	
	(0.0192)	
Mother(Non-Hispanic White)	0.0006	
	(0.0241)	
Mother(African American)	-0.0013	
	(0.0312)	
Mother(Native American)	-0.0474**	
	(0.0217)	
Mother(Asian American)	-0.0670**	
	(0.0279)	
Mother(Other Ethnic background)	-0.0327	
	(0.027)	
Mother(Never went to school)	-0.1794	-1580.1
	(0.1242)	(3696.47)
Mother(8th grade or less)	-0.1090***	3509.2**
	(0.0201)	(1727.85)
Mother(above 8th grade,not graduate from high school)	-0.0225	-1674.2*
	(0.0151)	(952.704)
Mother(Business,trade or vocational school)	0.0011	-661.6
	(0.039)	(1977.03)
Mother(High school graduate)	0.0030	-60.7
	(0.0111)	(850.554)

Mother(Completed a GED)	-0.0283	-709.1
	(0.0203)	(1163.49)
Mother(Business,trade or vocational school after high school)	0.0081	-559.9
	(0.013)	(891.632)
Mother(College, but did not graduate)	0.0336***	-211.3
	(0.0112)	(870.407)
Mother(Graduated from a college or university)	0.0331***	371.8
	(0.0115)	(1030.77)
Mother(Professional training after a 4-year college or university)	0.0358***	1250.9
	(0.0127)	(1069.88)
Father(Never went to school)	-0.0334	-2688.2
	(0.2003)	(4715.66)
Father(8th grade or less)	-0.0325*	565.3
	(0.017)	(1508.88)
Father(above 8th grade,not graduate from high school)	-0.0434***	-542.7
	(0.0132)	(873.087)
Father(Business,trade or vocational school)	-0.0551	1535.8
	(0.0368)	(1770.41)
Father(High school graduate)	0.0084	-1395.5***
	(0.0087)	(513.373)
Father(Completed a GED)	0.0176	-57.4
	(0.0177)	(1643.47)
Father(Business,trade or vocational school after high school)	-0.0010	-852.3
	(0.0112)	(655.133)
Father(College, but did not graduate)	0.0196**	-991.9*
	(0.009)	(600.362)
Father(Graduated from a college or university)	0.0101	95.2
	(0.0093)	(640.989)
Father(Professional training after a 4-year college or university)	0.0054	-241.5
	(0.0102)	(720.675)
Mother(Health:poor)		
Mother(Health:fair)	0.0024	-910.1
	(0.0234)	(1576.14)
Mother(Health:good)	0.0219	45.0
	(0.0221)	(1509.31)
Mother(Health:very good)	0.0539**	291.5
	(0.022)	(1548.84)
Mother(Health:excellent)	0.0373*	1252.3
	(0.0225)	(1617.42)
Father(Health:poor)		
Father(Health:fair)	0.0341*	121.1

	(0.0207)	(1629.2)
Father(Health:good)	0.0422**	1192.9
	(0.0199)	(1642.05)
Father(Health:very good)	0.0398**	1310.2
	(0.0201)	(1689.77)
Father(Health:excellent)	0.0387*	783.3
	(0.0207)	(1817.48)
Mother's employment status	0.0228***	428.8
	(0.0079)	(489.871)
Father's employment status	-0.0187	-915.3
	(0.012)	(1109.33)
Young adult(Hispanic)	-0.0005	1276.4
	(0.0188)	(972.455)
Young adult(Non-Hispanic White)	-0.0038	-752.8
	(0.0182)	(1064.19)
Young adult(African)	-0.0105	-2655.6**
	(0.0257)	(1144.24)
Young adult(Native)	0.0380**	-3692.4***
	(0.0165)	(1022.7)
Young adult(Asian)	0.0374	2689.5*
	(0.0239)	(1389.64)
Female adult	-0.0039	-7500.9***
	(0.0061)	(472.382)
Age of young adults	-0.0076	1486.6***
	(0.0063)	(169.747)
Averge working experience	0.0163	10891.3***
	(0.0143)	(1111.05)
Birth weight	0.0037	
	(0.0022)	
Health outcome of adolescent	0.0042	
	(0.0035)	
In Wave 4	0.0542	12005.4***
	(0.045)	(1234.92)
Single parent Indicator	-0.0520***	330.7
	(0.0079)	(577.628)
Constant	0.5410***	-67764.1***
	(0.0897)	(8027.77)
Observations	26068	23982

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 26. Bivariate Probit Analysis – Health Outcome of Young Adults

	Health insurance status of adolescents
Health insurance status of adolescents	
Ratio of having health insurance in the community	1.9379***
	(0.2324)
Age of adolescents	-0.0683***
	(0.0084)
Female adolescent	-0.0066
	(0.029)
Household income of adolescents	0.0030***
	(0.0007)
Mother(Hispanic)	-0.1589**
	(0.0769)
Mother(Non-Hispanic White)	0.0148
	(0.0904)
Mother(African American)	0.0662
	(0.1141)
Mother(Native American)	-0.1775**
	(0.0769)
Mother(Asian American)	-0.2659**
	(0.1064)
Mother(Other Ethnic background)	-0.1136
	(0.0978)
Father(Hispanic)	0.0550
	(0.0717)
Father(Non-Hispanic White)	0.0562
	(0.0847)
Father(African American)	0.0769
	(0.1008)
Father(Native American)	-0.3418***
	(0.081)
Father(Asian American)	-0.0917
	(0.0934)
Father(Other Ethnic background)	0.0029
	(0.093)
Mother(Never went to school)	-0.5503
	(0.3464)
Mother(8th grade or less)	-0.3214***
	(0.0648)
Mother(above 8th grade,not graduate from high school)	-0.0971*
	(0.0558)
Mother(Business,trade or vocational school)	-0.0119
	(0.1452)
Mother(High school graduate)	-0.0225
	(0.0453)
Mother(Completed a GED)	-0.1595**
	(0.0761)
Mother(Business,trade or vocational school after high school)	0.0062
	(0.0575)

Mother(College, but did not graduate)	0.1379***
	(0.0493)
Mother(Graduated from a college or university)	0.1655***
	(0.0553)
Mother(Professional training after a 4-year college or university)	0.1890***
	(0.069)
Father(Never went to school)	-0.0836
	(0.5403)
Father(8th grade or less)	-0.1025*
	(0.0592)
Father(above 8th grade,not graduate from high school)	-0.1609***
	(0.0483)
Father(Business,trade or vocational school)	-0.2246*
	(0.1316)
Father(High school graduate)	0.0135
	(0.0372)
Father(Completed a GED)	0.0652
	(0.0779)
Father(Business,trade or vocational school after high school)	0.0036
	(0.0517)
Father(College, but did not graduate)	0.0932**
	(0.043)
Father(Graduated from a college or university)	0.0413
	(0.0447)
Father(Professional training after a 4-year college or university)	0.0397
	(0.0518)
Mother(Health:poor)	-0.1194
	(0.0816)
Mother(Health:fair)	-0.1388**
	(0.0541)
Mother(Health:good)	-0.0795*
	(0.0443)
Mother(Health:very good)	0.0909**
	(0.0441)
Mother(Health:excellent)	
Father(Health:poor)	-0.1137
	(0.0823)
Father(Health:fair)	-0.0066
	(0.0559)
Father(Health:good)	0.0145
	(0.0448)
Father(Health:very good)	-0.0002
	(0.0435)
Father(Health:excellent)	
Mother’s employment status	0.0920***
	(0.0334)
Father’s employment status	-0.0525
	(0.0506)

Adolescent(Hispanic)	-0.0332
	(0.0801)
Adolescent(Non-Hispanic White)	0.0006
	(0.0791)
Adolescent(African)	-0.0410
	(0.1038)
Adolescent(Native American)	0.1578**
	(0.077)
Adolescent(Asian)	0.2115**
	(0.1034)
Birth weight	0.0214**
	(0.0101)
Health outcome of adolescent	0.1016***
	(0.0316)
	Health outcome of young adult
Health insurance status of adolescents	0.7437***
	(0.2201)
Household income of adolescents	0.0003
	(0.0002)
Mother(Never went to school)	0.1418
	(0.1979)
Mother(8th grade or less)	-0.0002
	(0.0555)
Mother(above 8th grade,not graduate from high school)	-0.0757**
	(0.0382)
Mother(Business,trade or vocational school)	-0.2901***
	(0.0916)
Mother(High school graduate)	-0.0573*
	(0.0292)
Mother(Completed a GED)	-0.1257**
	(0.0532)
Mother(Business,trade or vocational school after high school)	-0.0384
	(0.037)
Mother(College, but did not graduate)	-0.0402
	(0.0316)
Mother(Graduated from a college or university)	-0.0448
	(0.0339)
Mother(Professional training after a 4-year college or university)	0.0922**
	(0.0404)
Father(Never went to school)	-0.4558*
	(0.2711)
Father(8th grade or less)	-0.0717*
	(0.0431)
Father(above 8th grade,not graduate from high school)	-0.0048
	(0.0358)
Father(Business,trade or vocational school)	-0.1151
	(0.1002)
Father(High school graduate)	-0.0587**
	(0.024)

Father(Completed a GED)	-0.1596***
	(0.0518)
Father(Business,trade or vocational school after high school)	-0.0492
	(0.0336)
Father(College, but did not graduate)	-0.0623**
	(0.0273)
Father(Graduated from a college or university)	0.0344
	(0.0281)
Father(Professional training after a 4-year college or university)	0.0302
	(0.0313)
Mother(Health:poor)	-0.1538**
	(0.0602)
Mother(Health:fair)	-0.2305***
	(0.039)
Mother(Health:good)	-0.1721***
	(0.029)
Mother(Health:very good)	-0.1397***
	(0.0272)
Mother(Health:excellent)	
Father(Health:poor)	0.0023
	(0.0569)
Father(Health:fair)	-0.0467
	(0.0366)
Father(Health:good)	-0.0360
	(0.0282)
Father(Health:very good)	0.0151
	(0.0273)
Father(Health:excellent)	
Father's employment status	0.0438
	(0.0331)
Mother's employment status	-0.0312
	(0.0224)
Female young adult	-0.1602***
	(0.0191)
Young adult (Hispanic)	-0.0340
	(0.0331)
Young adult (Non-Hispanic White)	0.0797
	(0.0488)
Young adult (African)	-0.0666
	(0.0501)
Young adult (Native)	-0.1712***
	(0.0454)
Young adult (Asian)	-0.0675
	(0.0535)
Age of young adult	0.0123
	(0.0061)
Smoking	-0.1942***
	(0.0113)

In Wave 4	-0.5697***
	(0.0419)
Constant	0.2231
	(0.3019)
athrho	-0.4376***
	(0.1456)
Observations	26066

Likelihood-ratio test of rho=0: chi2(1) = 9.03035 Prob chi2 = 0.0027
Standard errors in parentheses
$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 27.Bivariate Probit Analysis – Education Outcome of Young Adults

	Health insurance status of adolescents
Ratio of having health insurance in the community	2.0409***
	(0.2271)
Age of adolescents	-0.0684***
	(0.0085)
Female adolescent	-0.0182
	(0.0291)
Household income of adolescents	0.0032***
	(0.0007)
Mother(Hispanic)	-0.1938**
	(0.078)
Mother(Non-Hispanic White)	-0.0085
	(0.0924)
Mother(African American)	0.0357
	(0.1196)
Mother(Native American)	-0.1865**
	(0.0804)
Mother(Asian American)	-0.2932***
	(0.108)
Mother(Other Ethnic background)	-0.1321
	(0.101)
Father(Hispanic)	0.0546
	(0.0747)
Father(Non-Hispanic White)	0.0513
	(0.0878)
Father(African American)	0.0996
	(0.1029)
Father(Native American)	-0.3416***
	(0.0842)
Father(Asian American)	-0.1003
	(0.0968)
Father(Other Ethnic background)	-0.0015
	(0.0968)
Mother(Never went to school)	-0.5082
	(0.348)
Mother(8th grade or less)	-0.3271***
	(0.0648)
Mother(above 8th grade,not graduate from high school)	-0.1077*
	(0.0561)
Mother(Business,trade or vocational school)	-0.0066
	(0.1477)
Mother(High school graduate)	-0.0269
	(0.0455)
Mother(Completed a GED)	-0.1672**
	(0.0771)
Mother(Business,trade or vocational school after high school)	0.0036
	(0.0579)
Mother(College, but did not graduate)	0.1289***

	(0.0495)
Mother(Graduated from a college or university)	0.1626***
	(0.0556)
Mother(Professional training after a 4-year college or university)	0.1918***
	(0.0696)
Father(Never went to school)	-0.0958
	(0.5302)
Father(8th grade or less)	-0.1060*
	(0.0594)
Father(above 8th grade,not graduate from high school)	-0.1683*
	(0.0484)
Father(Business,trade or vocational school)	-0.2294*
	(0.1322)
Father(High school graduate)	0.0111
	(0.0376)
Father(Completed a GED)	0.0414
	(0.0782)
Father(Business,trade or vocational school after high school)	-0.0036
	(0.0523)
Father(College, but did not graduate)	0.0929**
	(0.0435)
Father(Graduated from a college or university)	0.0405
	(0.0451)
Father(Professional training after a 4-year college or university)	0.0448
	(0.0526)
Mother(Health:poor)	-0.1459*
	(0.0812)
Mother(Health:fair)	-0.1572***
	(0.0544)
Mother(Health:good)	-0.0915**
	(0.0448)
Mother(Health:very good)	0.0860*
	(0.0447)
Mother(Health:excellent)	
Father(Health:poor)	-0.1443*
	(0.0816)
Father(Health:fair)	-0.0217
	(0.0563)
Father(Health:good)	0.0010
	(0.0449)
Father(Health:very good)	-0.0052
	(0.044)
Father(Health:excellent)	
Mother’s employment status	0.0919***
	(0.0337)
Father’s employment status	-0.0528
	(0.0511)
Adolescent(Hispanic)	0.0003

	(0.0809)
Adolescent(Non-Hispanic White)	0.0053
	(0.081)
Adolescent(African)	-0.0486
	(0.1086)
Adolescent(Native American)	0.1472*
	(0.0785)
Adolescent(Asian)	0.2009*
	(0.1081)
Birthweight	0.0194*
	(0.0105)
Health outcome of adolescent	0.0297*
	(0.0179)
	Education outcome of young adult
Health insurance status of adolescents	0.1271
	(0.1615)
Household income of adolescents	0.0030***
	(0.0006)
Mother(Never went to school)	-0.4463
	(0.3201)
Mother(8th grade or less)	-0.2007***
	(0.071)
Mother(above 8th grade,not graduate from high school)	-0.4197***
	(0.0544)
Mother(Business,trade or vocational school)	-0.2379*
	(0.1359)
Mother(High school graduate)	-0.0520
	(0.0472)
Mother(Completed a GED)	-0.2079***
	(0.0736)
Mother(Business,trade or vocational school after high school)	0.0462
	(0.0611)
Mother(College, but did not graduate)	0.0301
	(0.0506)
Mother(Graduated from a college or university)	0.1590***
	(0.0594)
Mother(Professional training after a 4-year college or university)	0.3646***
	(0.0799)
Father(Never went to school)	-0.4120
	(0.4534)
Father(8th grade or less)	-0.0416
	(0.0598)
Father(above 8th grade,not graduate from high school)	-0.2135***
	(0.0481)
Father(Business,trade or vocational school)	-0.1635
	(0.1198)
Father(High school graduate)	-0.0659*
	(0.0373)
Father(Completed a GED)	-0.1260*

	(0.0696)
Father(Business,trade or vocational school after high school)	0.0158
	(0.0531)
Father(College, but did not graduate)	0.0296
	(0.0435)
Father(Graduated from a college or university)	0.0494
	(0.0456)
Father(Professional training after a 4-year college or university)	0.0401
	(0.0543)
Mother(Health:poor)	-0.2378***
	(0.0799)
Mother(Health:fair)	-0.1286**
	(0.0546)
Mother(Health:good)	-0.0433
	(0.045)
Mother(Health:very good)	-0.0107
	(0.0443)
Mother(Health:excellent)	
Father(Health:poor)	-0.1366*
	(0.0812)
Father(Health:fair)	-0.1128**
	(0.0565)
Father(Health:good)	-0.0778*
	(0.0451)
Father(Health:very good)	-0.0533
	(0.0446)
Father(Health:excellent)	
Father's employment status	0.0302
	(0.049)
Mother's employment status	0.0598*
	(0.0335)
Female young adult	0.1990***
	(0.0285)
Young adult (Hispanic)	-0.0328
	(0.0433)
Young adult (Non-Hispanic White)	0.0351
	(0.0814)
Young adult (African)	-0.0404
	(0.0837)
Young adult (Native)	-0.1644**
	(0.0707)
Young adult (Asian)	0.3499***
	(0.0975)
Age of young adult	0.0721***
	(0.0086)
Currently In School	0.7455***
	(0.0351)
In Wave 4	-0.0867

	(0.0606)
Constant	-0.8440***
	(0.2821)
athrho	0.0002
	(0.0897)
Observations	26056

Likelihood-ratio test of rho=0: chi2(1) = 9.5e-06 Prob chi2 = 0.997
Standard errors in parentheses
$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 28.Bivariate Probit Analysis – Personal Earnings of Young Adults

	(1) Health insurance status of adolescents
Ratio of having health insurance in the community	2.0547***
	(0.2251)
Age of adolescents	-0.0690***
	(0.0085)
Female adolescent	-0.0183
	(0.0289)
Household income of adolescents	0.0032***
	(0.0007)
Mother(Hispanic)	-0.1962**
	(0.0775)
Mother(Non-Hispanic White)	0.0005
	(0.0927)
Mother(African American)	0.0422
	(0.1202)
Mother(Native American)	-0.1776**
	(0.0803)
Mother(Asian American)	-0.2831***
	(0.1086)
Mother(Other Ethnic background)	-0.1214
	(0.1014)
Father(Hispanic)	0.0596
	(0.0739)
Father(Non-Hispanic White)	0.0461
	(0.0876)
Father(African American)	0.0929
	(0.1018)
Father(Native American)	-0.3497***
	(0.0839)
Father(Asian American)	-0.1071
	(0.0966)
Father(Other Ethnic background)	-0.0028
	(0.0959)
Mother(Never went to school)	-0.5087
	(0.3487)
Mother(8th grade or less)	-0.3274***
	(0.0648)
Mother(above 8th grade,not graduate from high school)	-0.1077*
	(0.0556)
Mother(Business,trade or vocational school)	-0.0117
	(0.1476)
Mother(High school graduate)	-0.0279
	(0.0453)
Mother(Completed a GED)	-0.1661**
	(0.0769)
Mother(Business,trade or vocational school after high school)	0.0043
	(0.0578)

Mother(College, but did not graduate)	0.1281***
	(0.0494)
Mother(Graduated from a college or university)	0.1628***
	(0.0555)
Mother(Professional training after a 4-year college or university)	0.1927***
	(0.0695)
Father(Never went to school)	-0.1014
	(0.5351)
Father(8th grade or less)	-0.1066*
	(0.0593)
Father(above 8th grade,not graduate from high school)	-0.1677***
	(0.0483)
Father(Business,trade or vocational school)	-0.2328*
	(0.1317)
Father(High school graduate)	0.0137
	(0.0376)
Father(Completed a GED)	0.0434
	(0.0779)
Father(Business,trade or vocational school after high school)	-0.0008
	(0.0521)
Father(College, but did not graduate)	0.0935**
	(0.0435)
Father(Graduated from a college or university)	0.0395
	(0.0451)
Father(Professional training after a 4-year college or university)	0.0473
	(0.0525)
Mother(Health:poor)	-0.1454*
	(0.0807)
Mother(Health:fair)	-0.1564***
	(0.0541)
Mother(Health:good)	-0.0911**
	(0.0447)
Mother(Health:very good)	0.0852*
	(0.0446)
Mother(Health:excellent)	
Father(Health:poor)	-0.1433*
	(0.0816)
Father(Health:fair)	-0.0216
	(0.0561)
Father(Health:good)	0.0007
	(0.0448)
Father(Health:very good)	-0.0057
	(0.0439)
Father(Health:excellent)	
Mother’s employment status	0.0901***
	(0.0337)
Father’s employment status	-0.0534
	(0.051)
Adolescent(Hispanic)	-0.0036

	(0.0804)
Adolescent(Non-Hispanic White)	0.0074
	(0.0806)
Adolescent(African)	-0.0451
	(0.1081)
Adolescent(Native)	0.1388*
	(0.0785)
Adolescent(Asian)	0.2034*
	(0.1074)
Birth weight	0.0204*
	(0.0105)
Health status of adolescent	0.0312**
	(0.0158)
	Personal earnings of young adult
Health insurance status of adolescents	0.2968**
	(0.1489)
Household income of adolescents	0.0000
	(0.0002)
Mother(Never went to school)	0.2165
	(0.2946)
Mother(8th grade or less)	0.0151
	(0.0465)
Mother(above 8th grade,not graduate from high school)	-0.0996***
	(0.0341)
Mother(Business,trade or vocational school)	-0.1210
	(0.0891)
Mother(High school graduate)	0.0064
	(0.027)
Mother(Completed a GED)	-0.0907*
	(0.048)
Mother(Business,trade or vocational school after high school)	0.0207
	(0.0339)
Mother(College, but did not graduate)	-0.0245
	(0.0289)
Mother(Graduated from a college or university)	-0.0358
	(0.0312)
Mother(Professional training after a 4-year college or university)	-0.0428
	(0.0358)
Father(Never went to school)	0.0143
	(0.349)
Father(8th grade or less)	0.0399
	(0.0393)
Father(above 8th grade,not graduate from high school)	0.0303
	(0.0335)
Father(Business,trade or vocational school)	0.0269
	(0.0873)
Father(High school graduate)	-0.0002
	(0.0234)
Father(Completed a GED)	-0.0072

	(0.0469)
Father(Business,trade or vocational school after high school)	0.0188
	(0.0323)
Father(College, but did not graduate)	0.0473*
	(0.0265)
Father(Graduated from a college or university)	-0.0347
	(0.0263)
Father(Professional training after a 4-year college or university)	-0.0538*
	(0.0289)
Mother(Health:poor)	-0.0471
	(0.0532)
Mother(Health:fair)	-0.0354
	(0.0346)
Mother(Health:good)	0.0141
	(0.0267)
Mother(Health:very good)	0.0141
	(0.0255)
Mother(Health:excellent)	
Father(Health:poor)	-0.0742
	(0.0509)
Father(Health:fair)	0.0094
	(0.0347)
Father(Health:good)	-0.0149
	(0.0266)
Father(Health:very good)	-0.0234
	(0.0258)
Father(Health:excellent)	
Father's employment status	0.0143
	(0.031)
Mother's employment status	0.0235
	(0.0213)
Female young adult	-0.2385***
	(0.0178)
Young adult(Hispanic)	0.0724**
	(0.0293)
Young adult(Non-Hispanic White)	0.0045
	(0.0467)
Young adult(African)	-0.0721
	(0.0484)
Young adult(Native)	-0.0466
	(0.0444)
Young adult(Asian)	0.0923*
	(0.0517)
Age of young adult	0.0348***
	(0.0058)
Average Working Experience	0.5744***
	(0.0383)
In Wave 4	-0.1843***
	(0.0446)

Constant	-0.6125***
	(0.2113)
athrho	-0.1563
	(0.0838)
Observations	26066

Likelihood-ratio test of rho=0: chi2(1) = 3.47433 Prob chi2 = 0.0623
Standard errors in parentheses
$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 29. Propensity score matching: Nearest neighbor matching

Outcome variable	Treated	Control	Difference	Std. Err.	T-Stat
Health outcome	3.841	3.764	0.077 (*)	.043	1.76
Education	4.287	4.089	.197 (***)	.058	3.37
Personal earnings	24896.04	24416.86	479.18	1596.74	0.30

Table 30. Propensity score matching: Kernel matching

Outcome variable	Treated	Control	Difference	Std. Err.	T-Stat
Health outcome	3.841	3.762	.079 (***)	.019	4.09
Education	3.384	4.287	3.996 (***)	.025	11.30
Personal earnings	24896.04	22647.48	2248.55 (***)	761.37	2.95

Table 31. TSLS: The First Stage – Effects of Health Insurance of Adolescents on Outcomes of Young Adults

	(1) Health status	(2) Education	(3) Personal earnings
Ratio of having health insurance in the community	0.5125***	0.5124***	0.5071***
	(0.0581)	(0.0581)	(0.0595)
Household income of adolescents	0.0004***	0.0004***	0.0004***
	(0.0001)	(0.0001)	(0.0001)
Mother(Never went to school)	-0.1797	-0.1798	-0.2740**
	(0.1268)	(0.1268)	(0.1308)
Mother(8th grade or less)	-0.1090	-0.1088***	-0.1136***
	(0.0203)	(0.0203)	(0.021)
Mother(above 8th grade,not graduate from high school)	-0.0228	-0.0221	-0.0277*
	(0.0157)	(0.0157)	(0.016)
Mother(Business,trade or vocational school)	0.0015	0.0022	0.0161
	(0.0427)	(0.0427)	(0.0411)
Mother(High school graduate)	0.0029	0.0032	0.0038
	(0.0111)	(0.0111)	(0.0114)
Mother(Completed a GED)	-0.0285	-0.0279	-0.0274
	(0.0207)	(0.0207)	(0.0209)
Mother(Business,trade or vocational school after high school)	0.0080	0.0081	0.0094
	(0.0133)	(0.0133)	(0.0134)
Mother(College, but did not graduate)	0.0336***	0.0336***	0.0309***
	(0.0112)	(0.0112)	(0.0114)
Mother(Graduated from a college or university)	0.0330***	0.0324***	0.0295**
	(0.0117)	(0.0117)	(0.0118)
Mother(Professional training after a 4-year college or university)	0.0357***	0.0346***	0.0342***
	(0.0128)	(0.0128)	(0.013)
Father(Never went to school)	-0.0344	-0.0335	-0.0340
	(0.1976)	(0.1978)	(0.1937)
Father(8th grade or less)	-0.0322*	-0.0321*	-0.0344*
	(0.0169)	(0.0169)	(0.0176)
Father(above 8th grade,not graduate from high school)	-0.0434***	-0.0430***	-0.0424***
	(0.0134)	(0.0134)	(0.0137)
Father(Business,trade or vocational school)	-0.0551	-0.0547	-0.0603
	(0.0376)	(0.0375)	(0.0382)
Father(High school graduate)	0.0087	0.0087	0.0109
	(0.0086)	(0.0086)	(0.0088)
Father(Completed a GED)	0.0174	0.0175	0.0148
	(0.0182)	(0.0182)	(0.0185)

Father(Business,trade or vocational school after high school)	-0.0009	-0.0011	0.0011
	(0.0113)	(0.0113)	(0.0112)
Father(College, but did not graduate)	0.0196**	0.0194**	0.0189**
	(0.0091)	(0.0091)	(0.0092)
Father(Graduated from a college or university)	0.0101	0.0098	0.0081
	(0.0096)	(0.0096)	(0.0096)
Father(Professional training after a 4-year college or university)	0.0051	0.0047	0.0048
	(0.0103)	(0.0103)	(0.0104)
Mother(Health:poor)	-0.0369	-0.0366	-0.0484**
	(0.0237)	(0.0237)	(0.0245)
Mother(Health:fair)	-0.0345**	-0.0342**	-0.0385***
	(0.0134)	(0.0134)	(0.0135)
Mother(Health:good)	-0.0151	-0.0149	-0.0171*
	(0.0094)	(0.0094)	(0.0093)
Mother(Health:very good)	0.0169**	0.0170**	0.0105
	(0.0082)	(0.0082)	(0.0081)
Mother(Health:excellent)			
Father(Health:poor)	-0.0384	-0.0380*	-0.0427*
	(0.0214)	(0.0213)	(0.0218)
Father(Health:fair)	-0.0046	-0.0048	0.0026
	(0.0131)	(0.0131)	(0.0131)
Father(Health:good)	0.0036	0.0037	0.0051
	(0.0093)	(0.0093)	(0.0094)
Father(Health:very good)	0.0012	0.0012	0.0038
	(0.0086)	(0.0086)	(0.0085)
Father(Health:excellent)			
Father's employment status	-0.0185	-0.0184	-0.0126
	(0.0122)	(0.0122)	(0.0123)
Mother's employment status	0.0233***	0.0232***	0.0258***
	(0.0081)	(0.0081)	(0.0082)
Father(Hispanic)	0.0099	0.0092	0.0015
	(0.0189)	(0.0189)	(0.0193)
Father(Non-Hispanic White)	0.0119	0.0121	0.0124
	(0.0217)	(0.0217)	(0.0217)
Father(African American)	0.0478*	0.0480*	0.0531**
	(0.0251)	(0.0251)	(0.0251)
Father(Native American)	-0.0897***	-0.0892***	-0.0821***
	(0.0244)	(0.0244)	(0.0245)
Father(Asian American)	-0.0068	-0.0071	-0.0020
	(0.0238)	(0.0239)	(0.0241)
Father(Other Ethnic background)	0.0105	0.0106	0.0163
	(0.0244)	(0.0244)	(0.0242)
Mother(Hispanic)	-0.0550***	-0.0559***	-0.0587***
	(0.0196)	(0.0196)	(0.0199)

Mother(Non-Hispanic White)	0.0009	0.0006	-0.0036
	(0.0244)	(0.0244)	(0.0244)
Mother(African American)	-0.0012	-0.0016	-0.0097
	(0.0317)	(0.0316)	(0.0322)
Mother(Native American)	-0.0479**	-0.0479**	-0.0520**
	(0.022)	(0.022)	(0.0226)
Mother(Asian American)	-0.0668**	-0.0662**	-0.0744***
	(0.0279)	(0.028)	(0.0283)
Mother(Other Ethnic background)	-0.0325	-0.0323	-0.0418
	(0.0277)	(0.0277)	(0.028)
Single parent Indicator	-0.0521***	-0.0516***	-0.0528***
	(0.0081)	(0.0081)	(0.0083)
Young adult(Hispanic)	0.0001	0.0007	0.0069
	(0.019)	(0.0189)	(0.0191)
Young adult(Non-Hispanic White)	-0.0040	-0.0033	-0.0031
	(0.0189)	(0.0189)	(0.0187)
Young adult(African)	-0.0106	-0.0111	-0.0101
	(0.026)	(0.026)	(0.026)
Young adult(Native)	0.0378**	0.0383**	0.0376**
	(0.0165)	(0.0165)	(0.0165)
Young adult(Asian)	0.0368	0.0362	0.0407*
	(0.0247)	(0.0247)	(0.0242)
Female young adult	-0.0043	-0.0051	-0.0049
	(0.0062)	(0.0062)	(0.0062)
Age of young adults	-0.0072	-0.0068	-0.0073
	(0.0064)	(0.0064)	(0.0065)
Smoking	0.0015		
	(0.0032)		
Currently In School		0.0104**	
		(0.0051)	
Average working experience			0.0132
			(0.0146)
In Wave 4	0.0515	0.0504	0.0534
	(0.0456)	(0.0456)	(0.0467)
Age of adolescents	-0.0073	-0.0072	-0.0070
	(0.0065)	(0.0065)	(0.0067)
Birth weight	0.0037	0.0037	0.0040*
	(0.0024)	(0.0024)	(0.0024)
Health status of adolescent	0.0044	0.0040	0.0042
	(0.0035)	(0.0035)	(0.0035)
Constant	0.7090***	0.6920***	0.7035***
	(0.0871)	(0.0875)	(0.0887)
Observations	26066	26056	23982

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 32. TSLS: The Second Stage – Effects of Health Insurance of Adolescents on Outcomes of Young Adults

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	0.7808***	1.4095***	17044.10***
	(0.175)	(0.3746)	(5633.333)
Mother(Never went to school)	0.2608*	-0.0321	-140.51
	(0.1344)	(0.3415)	(5370.95)
Mother(8th grade or less)	0.0348	-0.0500	3612.68**
	(0.0494)	(0.0601)	(1778.476)
Mother(above 8th grade,not graduate from high school)	-0.0342	-0.3458***	-1585.52*
	(0.0315)	(0.0528)	(961.9869)
Mother(Business,trade or vocational school)	-0.1097	-0.2581**	-878.83
	(0.0959)	(0.1045)	(2080.581)
Mother(High school graduate)	-0.0324	-0.0688**	-74.55
	(0.0244)	(0.0277)	(735.2258)
Mother(Completed a GED)	-0.0795*	-0.2899***	-720.93
	(0.048)	(0.0558)	(1088.334)
Mother(Business,trade or vocational school after high school)	-0.0539*	0.0286	-580.37
	(0.0286)	(0.0376)	(711.107)
Mother(College, but did not graduate)	-0.0188	0.0036	-172.79
	(0.0274)	(0.0308)	(766.2582)
Mother(Graduated from a college or university)	-0.0326	0.1541***	423.81
	(0.024)	(0.0339)	(910.5724)
Mother(Professional training after a 4-year college or university)	0.0455	0.2658***	1270.15
	(0.0289)	(0.0357)	(866.6691)
Father(Never went to school)	-0.3230*	-0.1655	-2607.12
	(0.1729)	(0.3798)	(8058.103)
Father(8th grade or less)	-0.0198	-0.0778*	611.07
	(0.0338)	(0.0437)	(1375.344)
Father(above 8th grade,not graduate from high school)	0.0225	-0.1536***	-551.40
	(0.0253)	(0.037)	(866.0394)
Father(Business,trade or vocational school)	-0.0693	-0.1609	1627.60
	(0.0806)	(0.1028)	(1636.677)
Father(High school graduate)	-0.0378**	-0.1223***	-1436.66***
	(0.0167)	(0.0281)	(422.8322)
Father(Completed a GED)	-0.1272***	-0.1885***	-25.50
	(0.0381)	(0.0547)	(1810.062)
Father(Business,trade or vocational school after high school)	-0.0339*	-0.0136	-888.03
	(0.0203)	(0.0376)	(753.164)

Father(College, but did not graduate)	-0.0410*	0.0169	-986.08*
	(0.0246)	(0.0326)	(587.2272)
Father(Graduated from a college or university)	0.0097	0.1085***	120.34
	(0.0228)	(0.0264)	(594.8502)
Father(Professional training after a 4-year college or university)	0.0154	0.1096***	-236.07
	(0.0228)	(0.0327)	(671.6088)
Mother(Health:poor)	-0.1545***	-0.0887	-1081.51
	(0.0465)	(0.0662)	(1767.339)
Mother(Health:fair)	-0.1554***	-0.0751*	-2096.54**
	(0.0282)	(0.0391)	(986.2523)
Mother(Health:good)	-0.1195***	-0.0344	-1178.88*
	(0.0222)	(0.0285)	(605.9665)
Mother(Health:very good)	-0.1051***	-0.0437*	-866.91
	(0.0196)	(0.0245)	(671.3749)
Mother(Health:excellent)			
Father(Health:poor)	-0.0384	-0.0465	-724.84
	(0.0413)	(0.0637)	(1799.99)
Father(Health:fair)	-0.0577**	-0.0837**	-778.21
	(0.0275)	(0.0361)	(918.412)
Father(Health:good)	-0.0498**	-0.0614***	382.88
	(0.0198)	(0.0236)	(689.609)
Father(Health:very good)	-0.0146	-0.0369**	486.03
	(0.0184)	(0.0181)	(798.0545)
Father(Health:excellent)			
Father's employment status	0.0439*	0.0436	-1002.30
	(0.0244)	(0.0279)	(1043.701)
Mother's employment status	-0.0406**	0.0447	377.88
	(0.0172)	(0.0317)	(460.8671)
Single parent Indicator	0.0202	-0.0808**	338.35
	(0.0221)	(0.0342)	(649.7861)
Household income of adolescents	-0.00004	0.0009***	10.38
	(0.0001)	(0.0003)	(6.8222)
Young adult (Hispanic)	-0.0228	0.0168	1289.12
	(0.0244)	(0.0418)	(1018.832)
Young adult (Non-Hispanic White)	0.0347	0.0021	-770.09
	(0.0478)	(0.0545)	(1274.425)
Young adult (African	-0.0524	-0.0509	-2670.97**
	(0.0485)	(0.0546)	(1182.465)
Young adult (Native)	-0.0892**	-0.2030***	-3686.51***
	(0.0358)	(0.0406)	(1053.235)
Young adult (Asian)	-0.0163	0.2213**	2632.42
	(0.0719)	(0.0908)	(2084.431)
Female young adult	-0.1326***	0.2056***	-7485.20***
	(0.0143)	(0.0161)	(591.1006)
Age of young adults	0.0144***	0.0752***	1473.28***
	(0.0047)	(0.0093)	(194.319)

Smoking	-0.1434***		
	(0.0083)		
Currently In School		0.7942***	
		(0.0255)	
Average working experience			10933.32***
			(1226.312)
In Wave 4	-0.4891***	0.1378**	12085.26***
	(0.0364)	(0.0673)	(1429.579)
Constant	2.3373***	1.0495**	-37622.96***
	(0.2515)	(0.5215)	(8999.183)
Observations	26066	26056	23982

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 33. OLS Regression: Outcomes of Young Adults – Original Data

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	-0.021	0.141***	2073.443**
	(0.0336)	(0.0412)	(739.0037)
Household income of adolescents	0.001**	0.001***	25.699**
	(0.0002)	(0.0002)	(12.8270)
Mother's employment status	-0.010	0.047*	458.122
	(0.0219)	(0.0254)	(645.2850)
Father's employment status	0.085**	0.053	9.213
	(0.0368)	(0.0422)	(1406.2521)
Mother(Never went to school)		-2.520***	
		(0.1805)	
Mother(8th grade or less)	-1.094***	0.130	13927.653***
	(0.1031)	(0.1368)	(3518.9660)
Mother(above 8th grade,not graduate from high school)	-1.106***	-0.041	10782.426**
	(0.1184)	(0.1277)	(3542.5607)
Mother(Business,trade or vocational school)	-1.165***		11333.499**
	(0.1600)		(4156.2074)
Mother(High school graduate)	-0.989***	0.348**	14287.419***
	(0.1174)	(0.1225)	(3542.0073)
Mother(Completed a GED)	-1.099***	-0.039	12757.542***
	(0.1257)	(0.1338)	(3680.9626)
Mother(Business,trade or vocational school after high school)	-1.019***	0.423***	13072.190***
	(0.1197)	(0.1249)	(3634.9434)
Mother(College, but did not graduate)	-0.979***	0.426***	13989.336***
	(0.1185)	(0.1230)	(3632.9642)
Mother(Graduated from a college or university)	-0.975***	0.563***	13258.521***
	(0.1199)	(0.1234)	(3724.0410)
Mother(Professional training after a 4-year college or university)	-0.936***	0.683***	16087.915***
	(0.1215)	(0.1239)	(3721.9685)
Father(Never went to school)			7829.701**
			(3680.6269)
Father(8th grade or less)	0.552***	-1.271***	-4533.622
	(0.0726)	(0.0831)	(3351.0205)
Father(above 8th grade,not graduate from high school)	0.661***	-1.299***	-3719.120
	(0.0788)	(0.0894)	(3271.9642)
Father(Business,trade or vocational school)	0.515***	-1.467***	
	(0.1199)	(0.1428)	
Father(High school graduate)	0.634***	-1.131***	-4020.585
	(0.0775)	(0.0876)	(3057.2456)

Father(Completed a GED)	0.500***	-1.199***	-3783.113
	(0.0903)	(0.1067)	(3300.8827)
Father(Business,trade or vocational school after high school)	0.647***	-0.964***	-3550.667
	(0.0816)	(0.0916)	(3144.6640)
Father(College, but did not graduate)	0.648***	-0.887***	-3785.148
	(0.0784)	(0.0890)	(3096.4256)
Father(Graduated from a college or university)	0.711***	-0.725***	-1121.973
	(0.0806)	(0.0897)	(3152.8554)
Father(Professional training after a 4-year college or university)	0.771***	-0.663***	-2142.698
	(0.0820)	(0.0910)	(3248.6786)
Mother(Health:poor)	0.035		
	(0.0750)		
Mother(Health:fair)		0.106	-2606.036
		(0.0873)	(1925.4600)
Mother(Health:good)	0.051	0.150*	-582.835
	(0.0362)	(0.0830)	(1859.9263)
Mother(Health:very good)	0.101**	0.157*	-495.367
	(0.0368)	(0.0834)	(1870.2464)
Mother(Health:excellent)	0.179***	0.183**	1344.073
	(0.0391)	(0.0846)	(1921.3365)
Father(Health:poor)	0.099*	-0.046	-1602.989
	(0.0599)	(0.0710)	(1339.3083)
Father(Health:fair)			
Father(Health:good)	0.070**	0.035	1369.847
	(0.0350)	(0.0399)	(870.8761)
Father(Health:very good)	0.125***	0.078*	2096.224**
	(0.0359)	(0.0410)	(1034.9528)
Father(Health:excellent)	0.142***	0.048	373.621
	(0.0393)	(0.0440)	(1088.2351)
Young adult(Hispanic)	-0.032	0.009	2702.019**
	(0.0331)	(0.0376)	(1263.7397)
Young adult(Non-Hispanic White)	0.075	-0.090	-3525.182**
	(0.0540)	(0.0659)	(1364.0318)
Young adult(African)	-0.025	-0.101	-4231.586**
	(0.0575)	(0.0683)	(1480.3303)
Young adult(Native)	-0.019	-0.169**	-5999.940***
	(0.0475)	(0.0577)	(975.8999)
Young adult(Asian)	-0.024	0.028	-542.067
	(0.0586)	(0.0713)	(1874.5324)
Gender of young adult (1 as male, 2 as female)	-0.085***	0.194***	-7772.891***
	(0.0180)	(0.0204)	(643.8690)
Age of young adult	0.009*	0.069***	1416.513***
	(0.0052)	(0.0059)	(211.8560)
Smoking	-0.176***		
	(0.0108)		

In Wave 4	-0.372***	0.181***	13871.054***
	(0.0388)	(0.0437)	(1563.4720)
Single parent Indicator	-0.021	-0.160***	-2334.699**
	(0.0352)	(0.0420)	(751.4284)
Currently in school		0.744***	
		(0.0187)	
Average Working Experience			10276.384***
			(1749.2051)
Constant	3.681***	2.554***	-33518.956**
	(0.3566)	(0.2971)	(11045.1499)
Observations	12068	13863	12538

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table 34. Ordered Logistic Regression: Original dataset

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	-0.058	0.291***	0.014
	(0.0713)	(0.0771)	(0.0551)
Household income of adolescents	0.001**	0.003***	0.001*
	(0.0004)	(0.0005)	(0.0003)
Mother's employment status	-0.032	0.080	0.007
	(0.0471)	(0.0512)	(0.0371)
Father's employment status	0.178**	0.096	0.066
	(0.0791)	(0.0841)	(0.0652)
Mother(Never went to school)	1.709***	-6.685***	0.788***
	(0.2635)	(0.2877)	(0.2136)
Mother(8th grade or less)	-0.384**	-1.253***	0.044
	(0.1503)	(0.1489)	(0.1058)
Mother(above 8th grade,not graduate from high school)	-0.392***	-1.545***	-0.164*
	(0.1054)	(0.1137)	(0.0842)
Mother(Business,trade or vocational school)	-0.499**	-1.508***	0.011
	(0.2334)	(0.2308)	(0.1801)
Mother(High school graduate)	-0.144*	-0.866***	0.031
	(0.0806)	(0.0861)	(0.0643)
Mother(Completed a GED)	-0.350**	-1.529***	0.030
	(0.1299)	(0.1322)	(0.1030)
Mother(Business,trade or vocational school after high school)	-0.208**	-0.699***	-0.005
	(0.0908)	(0.0979)	(0.0726)
Mother(College, but did not graduate)	-0.101	-0.714***	-0.045
	(0.0799)	(0.0831)	(0.0651)
Mother(Graduated from a college or university)	-0.101	-0.344***	-0.045
	(0.0793)	(0.0821)	(0.0650)
Mother(Professional training after a 4-year college or university)			
Father(Never went to school)	-1.603***	1.109***	-0.241*
	(0.1810)	(0.1761)	(0.1355)
Father(8th grade or less)	-0.489***	-1.356***	-0.068
	(0.1318)	(0.1314)	(0.0972)
Father(above 8th grade,not graduate from high school)	-0.267**	-1.423***	-0.011
	(0.0978)	(0.1059)	(0.0779)
Father(Business,trade or vocational school)	-0.583**	-1.741***	0.305**
	(0.2183)	(0.2224)	(0.1519)
Father(High school graduate)	-0.310***	-1.124***	0.021
	(0.0774)	(0.0841)	(0.0600)
Father(Completed a GED)	-0.598***	-1.250***	0.009

	(0.1219)	(0.1343)	(0.1008)
Father(Business,trade or vocational school after high school)	-0.290**	-0.800***	-0.011
	(0.0902)	(0.0948)	(0.0695)
Father(College, but did not graduate)	-0.279***	-0.638***	0.074
	(0.0766)	(0.0826)	(0.0612)
Father(Graduated from a college or university)	-0.117	-0.206**	0.119**
	(0.0760)	(0.0792)	(0.0606)
Father(Professional training after a 4-year college or university)			
Mother(Health:poor)	-0.305**	-0.373**	-0.189
	(0.1545)	(0.1631)	(0.1308)
Mother(Health:fair)	-0.417***	-0.193**	-0.215***
	(0.0850)	(0.0900)	(0.0644)
Mother(Health:good)	-0.299***	-0.115*	-0.062
	(0.0606)	(0.0649)	(0.0465)
Mother(Health:very good)	-0.189***	-0.078	-0.040
	(0.0569)	(0.0603)	(0.0432)
Mother(Health:excellent)			
Father(Health:poor)	-0.082	-0.153	-0.135
	(0.1270)	(0.1375)	(0.1043)
Father(Health:fair)	-0.287***	-0.028	-0.010
	(0.0848)	(0.0884)	(0.0645)
Father(Health:good)	-0.144**	0.022	-0.028
	(0.0630)	(0.0668)	(0.0483)
Father(Health:very good)	-0.029	0.101	-0.028
	(0.0593)	(0.0624)	(0.0447)
Father(Health:excellent)			
Young adult(Hispanic)	-0.064	0.006	0.163**
	(0.0719)	(0.0746)	(0.0519)
Young adult(Non-Hispanic White)	0.129	-0.226*	-0.166*
	(0.1167)	(0.1291)	(0.0910)
Young adult(African)	-0.087	-0.224*	-0.124
	(0.1245)	(0.1340)	(0.0980)
Young adult(Native)	-0.036	-0.319**	-0.330***
	(0.1024)	(0.1093)	(0.0777)
Young adult(Asian)	-0.088	0.046	-0.022
	(0.1269)	(0.1460)	(0.1016)
Female young adult	-0.181***	0.429***	-0.492***
	(0.0392)	(0.0424)	(0.0308)
Age of young adult	0.019*	0.151***	0.160***
	(0.0112)	(0.0123)	(0.0104)
Smoking	-0.385***		
	(0.0237)		
In wave 4	-0.818***	0.341***	0.385***
	(0.0846)	(0.0903)	(0.0814)
Single parent Indicator	-0.051	-0.291***	-0.048

	(0.0769)	(0.0808)	(0.0596)
Currently in school		1.535***	
		(0.0445)	
Average Working Experience			0.161*
			(0.0896)
Observations	12068	13863	13362

Standard errors in parentheses;
$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 35. TSLS: The Second Stage – Effects of Health Insurance of Adolescents on Future Outcomes (Original Dataset)

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	-0.034	0.788**	11271.373
	(0.2418)	(0.2878)	(8469.9323)
Household income of adolescents	0.001**	0.001***	24.361*
	(0.0002)	(0.0002)	(14.6127)
Mother(Never went to school)			
Mother(8th grade or less)	-0.198**	-0.434***	-1405.837
	(0.0860)	(0.1035)	(2644.9289)
Mother(above 8th grade,not graduate from high school)	-0.173***	-0.686***	-4705.720**
	(0.0525)	(0.0613)	(1669.9437)
Mother(Business,trade or vocational school)	-0.194*	-0.619***	-4276.846
	(0.1170)	(0.1342)	(2953.7347)
Mother(High school graduate)	-0.053	-0.323***	-1881.048
	(0.0378)	(0.0363)	(1452.7523)
Mother(Completed a GED)	-0.148**	-0.642***	-2797.459
	(0.0671)	(0.0761)	(1917.6084)
Mother(Business,trade or vocational school after high school)	-0.086**	-0.263***	-3229.124**
	(0.0433)	(0.0428)	(1427.9215)
Mother(College, but did not graduate)	-0.038	-0.255***	-2144.020
	(0.0372)	(0.0343)	(1517.0311)
Mother(Graduated from a college or university)	-0.040	-0.121***	-3212.368**
	(0.0366)	(0.0320)	(1446.1971)
Mother(Professional training after a 4-year college or university)			
Father(Never went to school)	-0.740***	1.148***	17135.582**
	(0.1935)	(0.2253)	(6349.0907)
Father(8th grade or less)	-0.199**	-0.527***	-1471.283
	(0.0647)	(0.0762)	(2135.2656)
Father(above 8th grade,not graduate from high school)	-0.098*	-0.562***	-183.251
	(0.0537)	(0.0624)	(2309.8083)
Father(Business,trade or vocational school)	-0.203*	-0.685***	4115.243
	(0.1078)	(0.1212)	(3554.8385)
Father(High school graduate)	-0.131***	-0.438***	-1397.434
	(0.0362)	(0.0376)	(1282.4368)
Father(Completed a GED)	-0.262***	-0.518***	-1006.391
	(0.0579)	(0.0728)	(1865.8899)
Father(Business,trade or vocational	-0.116**	-0.268***	-697.693

school after high school)	(0.0418)	(0.0430)	(1462.0070)
Father(College, but did not graduate)	-0.111**	-0.198***	-1277.396
	(0.0359)	(0.0354)	(1304.6200)
Father(Graduated from a college or university)	-0.051	-0.036	1527.696
	(0.0352)	(0.0322)	(1505.5200)
Father(Professional training after a 4-year college or university)			
Mother(Health:poor)	-0.177**	-0.208**	-2556.101
	(0.0775)	(0.0974)	(1672.9768)
Mother(Health:fair)	-0.176***	-0.068	-3487.113**
	(0.0402)	(0.0476)	(1112.6796)
Mother(Health:good)	-0.137***	-0.016	-1608.784
	(0.0285)	(0.0319)	(984.5371)
Mother(Health:very good)	-0.082**	-0.022	-1699.702
	(0.0268)	(0.0288)	(1076.4205)
Mother(Health:excellent)	0.000	0.000	0.000
	(.)	(.)	(.)
Father(Health:poor)	-0.068	-0.058	-1006.147
	(0.0643)	(0.0823)	(1676.7700)
Father(Health:fair)	-0.141***	-0.049	-625.434
	(0.0405)	(0.0457)	(1126.4070)
Father(Health:good) 3.0000	-0.075**	-0.023	721.257
	(0.0295)	(0.0329)	(958.5063)
Father(Health:very good)	-0.025	0.024	1541.435
	(0.0278)	(0.0301)	(1126.7463)
Father(Health:excellent)			
Father's employment status	0.088**	0.040	-596.039
	(0.0385)	(0.0462)	(1520.0425)
Mother's employment status	-0.004	0.030	146.680
	(0.0242)	(0.0284)	(674.9429)
Single parent Indicator	-0.018	-0.153**	-2144.786**
	(0.0391)	(0.0468)	(862.9280)
Young adult(Hispanic)	-0.031	0.052	3732.282**
	(0.0358)	(0.0415)	(1377.9292)
Young adult(Non-Hispanic White)	0.098*	-0.132**	-3769.178**
	(0.0556)	(0.0671)	(1469.6796)
Young adult(African)	-0.012	-0.138*	-4739.302**
	(0.0599)	(0.0707)	(1562.2095)
Young adult(Native)	-0.005	-0.174**	-6081.773***
	(0.0482)	(0.0592)	(1019.1279)
Young adult(Asian)	-0.016	-0.002	-303.109
	(0.0602)	(0.0722)	(1975.7422)
Female young adult	-0.077***	0.203***	-7637.895***
	(0.0187)	(0.0216)	(711.8053)
Age of young adult	0.010*	0.072***	1559.602***
	(0.0054)	(0.0064)	(234.1839)
In Wave 4	-0.375***	0.154**	13052.352***

	(0.0405)	(0.0471)	(1707.9062)
Smoking	-0.176***		
	(0.0111)		
Currently in school		0.732***	
		(0.0195)	
Average Working Experience			9810.637***
			(1859.0322)
Constant	4.248***	2.183***	-32464.333**
	(0.3051)	(0.3455)	(11178.0760)
Observations	11390	13091	11844

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 36. OLS Regression – Effects of Health Insurance of Adolescents on Future Outcomes (Original Dataset Excluding Father's Background)

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	0.006	0.202***	1462.324**
	(0.0281)	(0.0343)	(655.5656)
Household income of adolescents	0.001***	0.002***	23.993**
	(0.0002)	(0.0002)	(10.1934)
Mother's employment status	-0.016	0.065**	814.352
	(0.0198)	(0.0234)	(550.1686)
Mother(Never went to school)	-0.109		-378.211
	(0.3203)		(5547.5570)
Mother(8th grade or less)	0.025	0.056	262.650
	(0.1064)	(0.3683)	(2665.0981)
Mother(above 8th grade,not graduate from high school)	0.047	-0.090	-2797.361
	(0.1005)	(0.3665)	(2614.0818)
Mother(Business,trade or vocational school)	0.000	0.112	0.000
	(.)	(0.3809)	(.)
Mother(High school graduate)	0.148	0.368	797.843
	(0.0974)	(0.3656)	(2613.3960)
Mother(Completed a GED)	0.060	0.016	-1046.517
	(0.1062)	(0.3688)	(2710.2332)
Mother(Business,trade or vocational school after high school)	0.142	0.483	827.014
	(0.0994)	(0.3664)	(2700.7863)
Mother(College, but did not graduate)	0.194**	0.549	1707.595
	(0.0981)	(0.3657)	(2654.8131)
Mother(Graduated from a college or university)	0.218**	0.764**	1701.968
	(0.0985)	(0.3658)	(2651.0821)
Mother(Professional training after a 4-year college or university)	0.308**	0.951**	3375.968
	(0.0996)	(0.3660)	(2807.3676)
Mother(Health:poor)	-0.009	-0.112	
	(0.0595)	(0.0704)	
Mother(Health:fair)			-1096.146
			(1371.9989)
Mother(Health:good)	0.068**	0.073**	615.564
	(0.0301)	(0.0357)	(1324.5928)
Mother(Health:very good)	0.118***	0.118**	1435.374
	(0.0305)	(0.0358)	(1356.8530)
Mother(Health:excellent)	0.229***	0.146***	2340.733*
	(0.0321)	(0.0377)	(1398.4965)
Young adult(Hispanic)	-0.051*	0.000	2154.546**
	(0.0287)	(0.0334)	(1063.5994)
Young adult(Non-Hispanic White)	0.053	0.027	-1640.104

	(0.0448)	(0.0550)	(1062.7024)
Young adult(African)	-0.047	0.012	-2466.273**
	(0.0472)	(0.0569)	(1190.8628)
Young adult(Native)	-0.022	-0.122**	-3790.161***
	(0.0413)	(0.0506)	(1004.2769)
Young adult(Asian)	-0.032	0.158**	1286.852
	(0.0512)	(0.0619)	(1636.2098)
Female young adult	-0.098***	0.197***	-7202.330***
	(0.0160)	(0.0185)	(548.4508)
Age of young adult	0.004	0.070***	1305.809***
	(0.0046)	(0.0054)	(178.8551)
In Wave4	-0.341***	0.180***	13663.470***
	(0.0348)	(0.0399)	(1340.9047)
Single parent Indicator	-0.014	-0.169***	-1472.247**
	(0.0199)	(0.0235)	(616.4826)
Smoking	-0.159***		
	(0.0095)		
Currently in school		0.790***	
		(0.0170)	
Average working experience			10688.030***
			(1447.5603)
Constant	3.450***	0.982	-19662.385***
	(0.3176)	(0.6226)	(5837.5335)
Observations	15664	18085	16273

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 37. Ordered Logistic Regression – Effects of Health Insurance of Adolescents on Future Outcomes (Original Dataset Excluding Father's Background)

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	0.001	0.383***	0.019
	(0.0587)	(0.0622)	(0.0449)
Household income of adolescents	0.001**	0.004***	0.000
	(0.0004)	(0.0006)	(0.0003)
Mother's employment status	-0.038	0.107**	0.046
	(0.0419)	(0.0443)	(0.0327)
Mother(Never went to school)	-0.895	-1.921**	0.211
	(0.6642)	(0.6307)	(0.4466)
Mother(8th grade or less)	-0.617***	-1.877***	-0.018
	(0.1160)	(0.1174)	(0.0827)
Mother(above 8th grade,not graduate from high school)	-0.577***	-2.113***	-0.202**
	(0.0845)	(0.0919)	(0.0690)
Mother(Business,trade or vocational school)	-0.686**	-1.759***	-0.024
	(0.2117)	(0.2060)	(0.1598)
Mother(High school graduate)	-0.367***	-1.344***	-0.013
	(0.0649)	(0.0701)	(0.0520)
Mother(Completed a GED)	-0.532***	-1.927***	-0.050
	(0.1113)	(0.1100)	(0.0845)
Mother(Business,trade or vocational school after high school)	-0.379***	-1.105***	-0.028
	(0.0745)	(0.0817)	(0.0606)
Mother(College, but did not graduate)	-0.256***	-0.996***	-0.017
	(0.0663)	(0.0694)	(0.0539)
Mother(Graduated from a college or university)	-0.202**	-0.471***	-0.004
	(0.0681)	(0.0719)	(0.0558)
Mother(Professional training after a 4-year college or university)			
Mother(Health:poor)	-0.512***	-0.501***	-0.226**
	(0.1194)	(0.1245)	(0.0965)
Mother(Health:fair)	-0.502***	-0.286***	-0.178***
	(0.0687)	(0.0721)	(0.0516)
Mother(Health:good)	-0.358***	-0.158**	-0.064*
	(0.0477)	(0.0517)	(0.0373)
Mother(Health:very good)	-0.242***	-0.060	-0.049
	(0.0467)	(0.0498)	(0.0358)
Mother(Health:excellent)			
Young adult(Hispanic)	-0.103*	-0.010	0.143**
	(0.0612)	(0.0630)	(0.0453)
Young adult(Non-Hispanic White)	0.096	-0.008	-0.043
	(0.0945)	(0.1034)	(0.0784)

Young adult(African)	-0.125	-0.012	-0.060
	(0.1000)	(0.1071)	(0.0828)
Young adult(Native)	-0.047	-0.221**	-0.194**
	(0.0876)	(0.0919)	(0.0685)
Young adult(Asian)	-0.079	0.284**	0.094
	(0.1084)	(0.1220)	(0.0905)
Female young adult	-0.206***	0.411***	-0.464***
	(0.0342)	(0.0365)	(0.0268)
Age of young adult	0.009	0.143***	0.157***
	(0.0098)	(0.0106)	(0.0091)
Smoking	-0.344***		
	(0.0204)		
In Wave 4	-0.728***	0.331***	0.317***
	(0.0740)	(0.0778)	(0.0706)
Single parent indicator	-0.034	-0.314***	-0.075**
	(0.0425)	(0.0451)	(0.0332)
Currently in school		1.563***	
		(0.0387)	
Average working experience			0.142*
			(0.0768)
Observations	15664	18085	17412

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 38. TSLS: The Second Stage - Effects of Health Insurance of Adolescents on Future Outcomes (Original Dataset Excluding Father's Background)

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescents	0.726**	1.419***	11735.824
	(0.2401)	(0.2963)	(7703.8406)
Household income of adolescents	0.000*	0.001***	22.987*
	(0.0002)	(0.0003)	(12.0226)
Mother(Never went to school)	-0.536	0.431	10691.211
	(0.3407)	(0.5318)	(9946.7402)
Mother(8th grade or less)	-0.115	-0.601***	-1030.689
	(0.0857)	(0.1024)	(2584.5064)
Mother(above 8th grade,not graduate from high school)	-0.160**	-0.910***	-4628.892**
	(0.0527)	(0.0616)	(1775.7696)
Mother(Business,trade or vocational school)	-0.177*	-0.643***	-1697.390
	(0.1066)	(0.1285)	(3330.8485)
Mother(High school graduate)	-0.127***	-0.525***	-2014.213
	(0.0331)	(0.0335)	(1374.8642)
Mother(Completed a GED)	-0.121*	-0.786***	-3012.473*
	(0.0656)	(0.0742)	(1816.6678)
Mother(Business,trade or vocational school after high school)	-0.127***	-0.429***	-2460.307*
	(0.0387)	(0.0412)	(1474.1389)
Mother(College, but did not graduate)	-0.096**	-0.383***	-1336.529
	(0.0321)	(0.0311)	(1347.3423)
Mother(Graduated from a college or university)	-0.077**	-0.171***	-1681.713
	(0.0329)	(0.0304)	(1286.3508)
Mother(Professional training after a 4-year college or university)			
Mother(Health:poor)	-0.220***	-0.224**	-2397.070*
	(0.0667)	(0.0847)	(1369.2410)
Mother(Health:fair)	-0.207***	-0.106**	-2827.350**
	(0.0357)	(0.0434)	(910.9860)
Mother(Health:good)	-0.157***	-0.039	-1349.329*
	(0.0237)	(0.0281)	(767.4936)
Mother(Health:very good)	-0.118***	-0.029	-947.192
	(0.0226)	(0.0258)	(813.7653)
Mother(Health:excellent)			
Mother's employment status	-0.030	0.040	620.693
	(0.0221)	(0.0272)	(579.4319)
Single parent indicator	0.020	-0.140***	-1116.929*
	(0.0232)	(0.0275)	(647.2328)
Young adult(Hispanic)	-0.017	0.100**	3111.961**

	(0.0335)	(0.0415)	(1243.5785)
Young adult(Non-Hispanic White)	0.071	0.038	-1754.368
	(0.0480)	(0.0611)	(1104.7721)
Young adult(African)	-0.056	0.004	-2894.029**
	(0.0506)	(0.0634)	(1185.5925)
Young adult(Native)	-0.025	-0.140**	-4684.327***
	(0.0437)	(0.0568)	(858.2046)
Young adult(Asian)	-0.015	0.162**	1512.241
	(0.0554)	(0.0691)	(1719.6884)
Female young adult	-0.089***	0.210***	-7154.933***
	(0.0171)	(0.0206)	(585.0468)
Age of young adult	0.010*	0.077***	1420.270***
	(0.0051)	(0.0063)	(201.8350)
Smoking	-0.159***		
	(0.0101)		
In Wave 4	-0.378***	0.122**	12958.722***
	(0.0384)	(0.0462)	(1491.6282)
Currently in school		0.768***	
		(0.0186)	
Average working experience			10261.740***
			(1556.2227)
Constant	3.514***	1.252***	-33133.941***
	(0.2898)	(0.3431)	(9347.5626)
Observations	14873	17179	15472

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 39. OLS regression: effects of health insurance of adolescents on future achievements

	(1) Health status of young adult	(2) Education of young adult	(3) Personal earnings of young adult
Health insurance status of adolescents	0.015	0.129***	2409.602***
	(0.0218)	(0.0284)	(609.3684)
Household income of adolescents	0.000**	0.002***	21.409**
	(0.0001)	(0.0002)	(8.2546)
Mother's employment status	-0.019	0.090***	387.884
	(0.0165)	(0.0209)	(525.8255)
Father's employment status	0.020	0.034	48.428
	(0.0250)	(0.0304)	(983.0822)
Mother's education	0.013***	0.081***	440.358***
	(0.0035)	(0.0045)	(113.1780)
Father's education	0.011**	0.052***	71.629
	(0.0034)	(0.0042)	(112.7016)
Mother's health status	0.059***	0.044***	778.630***
	(0.0075)	(0.0095)	(213.0959)
Father's health status	0.026***	0.030**	309.424
	(0.0076)	(0.0094)	(220.5746)
Young adult(Hispanic)	-0.050**	-0.019	1563.942*
	(0.0237)	(0.0288)	(870.3463)
Young adult(Non-Hispanic White)	0.039	-0.023	-1180.636
	(0.0379)	(0.0505)	(1195.7698)
Young adult(African)	-0.027	-0.047	-2267.212*
	(0.0401)	(0.0524)	(1286.8089)
Young adult(Native)	-0.091**	-0.169***	-3343.853**
	(0.0355)	(0.0471)	(1128.6786)
Young adult(Asian)	-0.058	0.131**	1943.642
	(0.0431)	(0.0553)	(1524.0963)
Female young adult	-0.135***	0.186***	-7699.135***
	(0.0139)	(0.0172)	(500.3993)
Age of young adult	0.002	0.057***	1258.262***
	(0.0040)	(0.0049)	(156.9888)
Smoking	-0.146***		
	(0.0080)		
In Wave 4	-0.390***	0.279***	13931.225***
	(0.0300)	(0.0364)	(1158.5342)
Single parent indicator	-0.036**	-0.218***	-626.466
	(0.0179)	(0.0228)	(636.7420)
Currently in school		0.801***	
		(0.0158)	
Average working experience			11239.243***
			(1288.0297)
Constant	4.311***	1.655***	-38675.900***
	(0.1201)	(0.1521)	(3980.2520)

Observations	21745	21736	20055

Standard errors in parentheses

$* p < 0.10, ** p < 0.05, *** p < 0.01$

Table 40. Ordinal Logistic regression: effects of health insurance of adolescents on future achievements (Original Dataset Excluding Father's Background)

	(1) Health status of young adult	(2) Education of young adult	(3) Personal earnings of young adults(ordinal)
Health insurance status of adolescents	0.029	0.239***	0.057
	(0.0455)	(0.0510)	(0.0357)
Household income of adolescents	0.001**	0.004***	0.000
	(0.0003)	(0.0005)	(0.0002)
Mother's employment status	-0.047	0.145***	0.027
	(0.0347)	(0.0390)	(0.0280)
Father's employment status	0.035	0.045	0.039
	(0.0531)	(0.0563)	(0.0428)
Mother's education	0.027***	0.159***	0.006
	(0.0075)	(0.0087)	(0.0059)
Father's education	0.025***	0.106***	-0.003
	(0.0071)	(0.0080)	(0.0055)
Mother's health status	0.128***	0.090***	0.048***
	(0.0157)	(0.0181)	(0.0126)
Father's health status	0.052**	0.048**	0.002
	(0.0160)	(0.0179)	(0.0128)
Young adult(Hispanic)	-0.093*	-0.011	0.073*
	(0.0501)	(0.0540)	(0.0377)
Young adult(Non-Hispanic White)	0.069	-0.102	-0.127**
	(0.0795)	(0.0927)	(0.0636)
Young adult(African)	-0.065	-0.123	-0.103
	(0.0844)	(0.0966)	(0.0679)
Young adult(Native)	-0.191**	-0.309***	-0.216*** >
	(0.0747)	(0.0841)	(0.0586)
Young adult(Asian)	-0.134	0.230**	0.022
	(0.0905)	(0.1058)	(0.0732)
Female young adult	-0.281***	0.376***	-0.447***
	(0.0295)	(0.0331)	(0.0234)
Age of young adult	0.003	0.115***	0.140***
	(0.0084)	(0.0095)	(0.0079)
Smoking	-0.310***		
	(0.0170)		
In Wave 4	-0.818***	0.507***	0.254***
	(0.0635)	(0.0701)	(0.0621)
Single parent indicator	-0.077**	-0.416***	-0.057*
	(0.0380)	(0.0428)	(0.0294)
Currently in school		1.559***	
		(0.0352)	
Average working experience			0.149**
			(0.0679)
Observations	21745	21736	21746

Standard errors in parentheses; $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$

Table 41. TSLS: The Second Stage - effects of health insurance of adolescents on future achievements (Original Dataset Excluding Father's Background)

	(1) Health status	(2) Education	(3) Personal earnings
Health insurance status of adolescent	1.029***	1.304***	14017.453**
	(0.1778)	(0.2175)	(5665.1180)
Household income of adolescents	0.000	0.001***	17.414**
	(0.0001)	(0.0002)	(8.2114)
Mother's education	-0.001	0.065***	280.840*
	(0.0046)	(0.0058)	(147.2326)
Father's education	0.002	0.043***	-18.334
	(0.0040)	(0.0049)	(118.4855)
Mother's health status	0.044***	0.027**	604.064**
	(0.0088)	(0.0110)	(230.0533)
Father's health status	0.022**	0.026**	277.987
	(0.0085)	(0.0104)	(225.8915)
Father's employment status	0.008	0.019	-157.309
	(0.0285)	(0.0342)	(989.0577)
Mother's employment status	-0.054**	0.049**	-79.514
	(0.0194)	(0.0244)	(559.7584)
Single parent indicator	0.022	-0.152***	56.408
	(0.0224)	(0.0277)	(639.3032)
Young adult(Hispanic)	0.041	0.088**	2620.535**
	(0.0306)	(0.0372)	(1053.7796)
Young adult(Non-Hispanic White	0.018	-0.048	-1439.742
	(0.0403)	(0.0549)	(1203.2492)
Young adult(African)	-0.066	-0.093	-2744.628**
	(0.0429)	(0.0575)	(1270.1074)
Young adult(Native)	-0.122**	-0.205***	-3679.282**
	(0.0381)	(0.0514)	(1136.1132)
Young adult(Asian)	-0.050	0.141**	1990.684
	(0.0462)	(0.0597)	(1543.2764)
Female young adults	-0.124***	0.199***	-7584.590***
	(0.0154)	(0.0188)	(514.6998)
Age of young adults	0.016***	0.073***	1432.450***
	(0.0050)	(0.0062)	(181.4125)
Smoking	-0.149***		
	(0.0087)		
In Wave 4	-0.495***	0.158***	12678.552***
	(0.0370)	(0.0451)	(1330.7736)
Currently in school		0.794***	
		(0.0170)	
Average working experience			10973.296***
			(1318.2178)
Constant	1.693***	0.158	-42006.382***
	(0.2199)	(0.2700)	(7002.6932)
Observations	21745	21736	20055

Standard errors in parentheses, $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$

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