ABSTRACT

Title of Dissertation: **ENVIRONMENTAL RISK FACTORS, HEALTH AND THE LABOR MARKET RESPONSE OF HOUSEHOLDS IN THE UNITED STATES**

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Many studies have shown an association between environmental exposures and certain health conditions. Estimates of the labor market impacts of these illnesses are often included in regulatory impact analyses of health and safety regulations. I estimate the magnitude of these effects using data from the Medical Expenditure Panel Survey for U.S. households from 1996 to 2002.

In the first part of the dissertation, I estimate the effect of a married adult's specific health condition on his or her own labor market decisions (labor force participation, earnings, hourly wages, and hours of work) and his or her spouse's. I focus on cancer, stroke, ischemic heart disease, emphysema, chronic bronchitis, chronic obstructive pulmonary disease (COPD) and asthma. The effects differ by

health condition and duration of the disease. With the exceptions of chronic bronchitis and COPD, all the health conditions here examined significantly reduce the probability that a married man participates in the labor force. The effect of a married woman's health condition on her labor force participation, even if statistically significant, is very small. Among married men who are working, having had emphysema for less than one year is enough to reduce the earnings of a man with college degree to those of a healthy man without high school diploma. My results also suggest that if a man has had cancer, his wife may have to compensate for the ensuing loss in household income by working more hours or entering the labor force.

In the second part of the dissertation, I focus on the effect of children's asthma on mothers' labor force participation, on fathers' and mothers' labor supply, and on their hourly wages and weekly earnings. I compare these effects to those of a set of health conditions that includes deformities, congenital anomalies, heart problems, epilepsy and cancer. I find that single mothers with chronically ill children are the most affected group in terms of hours of work lost and reduction in earnings, and that fathers with an asthmatic child less than six years old work more hours per week. Then, I explore how mothers' labor force participation and hours of work affect days missed from school of a chronically ill child. My results suggest that maternal employment is associated with a higher probability of a child missing school, and that this effect is the same for healthy children as for asthmatic children. In contrast, I find that if the mother works, then a child with deformities, congenital anomalies, heart problems, epilepsy or cancer is less likely to experience lost school days than if the mother does not work.

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By

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Dedication

To mamma Morena and papà Aldo

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Chapter 1: Introduction

Many studies have shown an association between environmental exposures and certain health conditions. For example, exposure to fine particulate matter ($PM_{2.5}$) or carbon monoxide has been associated with an increased number of hospitalizations and doctor visits due to cardiovascular problems and respiratory diseases (U.S. Environmental Protection Agency, 2000 and 1996b). Other examples include radon and lung cancer (U.S. EPA, 1999) and arsenic and cancer in several organs (Morales et al., 2000). Exposure to indoor and outdoor pollution (e.g., dust, tobacco smoke, particulate matter) has been shown to exacerbate asthma (Institute of Medicine, 2000; U.S. EPA, 1996a and 1996b). The World Health Organization (WHO) review of the health effects of air pollution on children's health concludes that there is sufficient evidence to assume a causal relationship between air pollution exposure and aggravation of asthma in children (WHO, 2005).

In addition to these studies showing a potential association between environmental pollutants exposure and health, Doll and Peto (1981) attribute two percent of all cancer deaths to pollution. Landrigan et al. (2002) estimate that 30% of childhood asthma is due to environmental exposures. They also estimate that 100% of all cases of lead poisoning is of environmental origin, at least 5-10% and less than 80-90% of childhood cancer can be attributed to toxic chemical in the environment, 10% of neurobehavioral disorders, such as dyslexia, attention-deficit hyperactivity disorder (ADHD), diminished intelligence, autism, and mental retardation are at least partly caused by toxic exposures.

A goal of many government agencies is to protect the health of the citizens from environmental pollutants through the implementation of specific regulations. Many environmental statutes and associated regulatory programs have been established to protect human health, such as the Clean Air Act of 1970, the Safe Drinking Water Act of 1974, and the Superfund program of 1980. Government agencies such as the Environmental and Protection Agency in U.S. or the Department for Environment, Food and Rural Affairs in U.K. regularly conduct cost-benefit analyses in order to investigate if proposed environmental programs justify the costs.

Cost-benefit analyses of health and safety regulations require estimates of the benefits of reducing pollution, and hence the risks of pollution-caused illnesses. One way to quantify the benefits of reducing a disease is to apply the Cost-of-Illness (COI) approach. The COI approach calculates the direct and indirect costs avoided because of health improvements. The direct costs include medical expenses, such as the costs of medication, doctor visits, hospitalization, and emergency room visits, while the indirect costs are measured in terms of lost work days and productivity losses. For less serious illnesses productivity losses may be short lived, while for serious illnesses such as heart attacks and strokes they may take the form of withdrawing from the labor force, or working fewer hours, and all of these adjustments may reduce lifetime earnings.

However, COI is likely to underestimate the benefits of reduced morbidity because it does not consider pain and suffering due to illness. In addition, the social benefits from reducing the incidence of a disease include the reduction in those costs of illness borne by the society, not just those borne by the affected individuals. For example, medical insurance spreads the costs of treatment among all policyholders, and sick leave

policies shift part of the cost of lost work days on the employer and on consumers, who pay higher prices for the employer's products (Freeman, 2003).

Despite its limitations the COI approach is used by the U.S. EPA (1997, 1999, 2005), the U.S. Department of Agriculture (Buzby et al., 1996; USDA Economic Research Service, 2007) and the Centers for Disease Control and Prevention (e.g., for workplace fatality, Briddle, 2004; for diabetes, CDC, 1999) in their benefit-cost analyses. In particular, U.S. EPA studies of the costs and benefits of the Clean Air Act (U.S. EPA, 1997 and 1999) and the Clean Air Interstate Rule (U.S. EPA, 2005) COI estimates are used to value the benefits from reducing stroke, coronary heart disease, hypertension, congestive heart failure, ischemic heart disease, chronic obstructive pulmonary disease (COPD), pneumonia, and emergency room visits for asthma. The estimates of lost earnings and productivity losses are drawn from studies (Bartel and Taubman, 1979; and Cropper and Krupnick, 1989) that use data from the 1970s. The results of Bartel and Taubman (1979) and Cropper and Krupnick (1989) may not reflect current relationships between health status and labor market decisions.

The main objective of this dissertation is two fold: first, I wish to investigate the effects of health conditions potentially caused by pollution on the labor market decisions of married individuals. Second, I wish to test if these effects accrue only to the sick individual or also to other household members, e.g., spouses and parents. The analysis is based on data from the Medical Expenditure Panel Survey (MEPS) for U.S. households from 1996 to 2002.

Few studies have examined the effects of specific environmental health conditions on an individual's labor market performance. Most of the literature that studies the effects of health on labor market decisions focuses on the effects of an individual's "health

status," "work limitation" or "disability status" and not on specific diseases. For cost-benefit analyses of specific environmental, health or safety policies, however, it is necessary to focus on specific health conditions.

In particular, in Chapter 2, I focus on married couples, and I examine the effects of health conditions potentially caused or exacerbated by environmental exposures on (i) labor force participation, (ii) earnings, (iii) wages and (iii) hours of work of the ill individual and his/her spouse. I focus on seven conditions previously linked to environmental exposures: cancer, stroke, ischemic heart disease, emphysema, chronic bronchitis, COPD and asthma.

I find that with the only exceptions of chronic bronchitis and COPD, all the health conditions here examined significantly reduce the probability that a married man participates in the labor force, although the effects differ by disease and duration of the illness. In contrast to married men, the effect of a married woman's health condition on her labor force participation, even if statistically significant, is very small. Among married men who are working, I find a reduction in earnings by 21.8% if a married man has had ischemic heart disease for less than one year, and by 51.2% if he has had emphysema for less than one year. To illustrate, having had emphysema for less than one year is enough to bring the earnings of a man with college degree down to those of a healthy man without high school diploma. If instead I consider married women I find that the only health condition that affects their earnings is stroke. A married woman that had a stroke experiences a 28.7% reduction in her earnings.

Furthermore, only emphysema and chronic bronchitis affect the number of hours of work of a married man, and only stroke negatively affects the hours of work of a married woman. If a married man has had emphysema for less than one year then he

experiences a reduction by 4.6 hours of work per week. To put things in perspective, in a month this is equivalent of one less part-time workweek. If for example, he has had chronic bronchitis for two years (median duration for chronic bronchitis) then he loses two hours per week, that is 100 hours per year. If a married woman had a stroke less than one year ago she experiences a reduction by about 9 hours of work per week, that is about a full time week per month.

Although not part of a cost-benefit analysis, it is of interest to investigate the household's vulnerability to shocks such as a sudden illness. I look at how a married woman or a married man of working age respond to the health condition of her/his spouse. My results suggest that if a man has had cancer, his wife may have to compensate for the ensuing loss in household income by working more hours or entering the labor force. In contrast, if a married woman is sick her husband's hours of work per week are not significantly affected, with the exception of the case when the disease is emphysema. If a married man has had a wife with emphysema for less than one year he works 3.12 hours per week less, that in a year corresponds to almost a month of work less. In addition, the hourly wage of a white married man with some college education and a wife who has had emphysema is equivalent to that of a non-white married man without a high school degree and with a healthy wife.

In Chapter 3 I focus on the effect of a child's asthma, a serious chronic disease in children in the U.S., on (i) mothers' participation in the labor force; (ii) the number of work hours of mothers and fathers, (iii) mothers' and fathers' wages and earnings. I also examine how mothers' labor force participation and hours of work in turn affect the health of an asthmatic child. I use as a measure of child's health the number of lost school days. I consider single mothers, and mothers and fathers with partners. I compare the

effects of asthma to the effects of a set of health conditions that includes deformities, congenital anomalies, heart problems, epilepsy, and cancer.

My results suggest that single mothers are the most affected group. To illustrate, the effect of having an asthmatic child less than six years old on the hours of work of a single mother is equivalent to having one more child without asthma less than six years old. I also find that while asthmatic children do not affect the productivity of mothers and their labor force participation, single mothers with a child with deformities, congenital anomalies, heart problems, epilepsy or cancer and less than six years old earn about 24.8% and 29.8% less than single mothers and mothers with partners without a child with any of these health conditions, respectively.

I do not find any significant effect of having a child with asthma on a mother's labor force participation for both single mothers and mothers with partners. However, I find that if the mother participates in the labor market, a child is more likely to lose days of school than if the mother does not participate. This effect holds equally for asthmatic children and for children without a serious chronic health condition. The effect is larger for children whose mother has a college degree than a high school degree, and for children with a single mother.

In contrast, I find that single mothers with a child with deformities, congenital anomalies, heart problems, epilepsy or cancer and of school age (age group 6-11) are more likely to work or to be looking for a job. However, my results suggest that if the mother works, then a child with deformities, congenital anomalies, heart problems, epilepsy or cancer is less likely to experience lost school days than if the mother does not work. These results should not be interpreted to imply that the family is better off if the

mother participates in the labor force neither that the impacts on lost school days are the only relevant welfare effect.

Finally, I find that fathers living with a partner and with an asthmatic child work more hours per year, and experience a decrease in their hourly wages. To illustrate, the hourly wage of a white father with an asthmatic child is equivalent to that of a non-white father with a healthy child. Chapter 4 concludes.

Chapter 2: Chronic Health Conditions and the Labor Market Response of Couples in the United States

2.1 Introduction

Many studies have shown an association between environmental exposures and certain health conditions (Abbey et al., 1991, 1994 and 1995; Schwartz, 1993; Ponka and Virtanen, 1994; Dockery, 2001; Peters et al., 2001; Pope et al., 2002; Chen et al., 2005; Sullivan et al., 2005; and Miller et al., 2007). For example, exposure to fine particulate matter ($PM_{2.5}$) or carbon monoxide has been associated with an increased number of hospitalizations and doctor visits due to cardiovascular problems and respiratory diseases (U.S. Environmental Protection Agency, 1996b and 2000). Exposure to indoor and outdoor pollution (e.g., dust, tobacco smoke, particulate matter) has been shown to exacerbate asthma (Institute of Medicine, 2000; U.S. EPA, 1996a and 1996b). Other examples include radon and lung cancer (U.S. EPA, 1999) and arsenic and cancer in several organs (Morales et al., 2000). Some subclinical effects on health (e.g., eyes irritation) are short-term and reversible; other health conditions such as emphysema, stroke, ischemic heart disease and cancer are more serious and they may have permanent effects. In addition, Doll and Peto (1981) attribute two percent of all cancer deaths to pollution.

This chapter examines the effects of adults' health conditions potentially caused or exacerbated by environmental exposures on (i) labor force participation, (ii) earnings and (iii) hours of work of the ill individual and his/her spouse. Few studies have

examined the effects of specific environmental health conditions on an individual's labor market performance, and even fewer have estimated the impacts on the labor market outcomes of family members. I focus on the impact of cancer, stroke, ischemic heart disease, emphysema, chronic bronchitis, chronic obstructive pulmonary disease (COPD) and asthma on the labor market decisions of married men and women of working age (under the age of 65) and their spouses. These illnesses were selected based on their possible association with environmental pollutants and on the anticipated future need of government agencies for cost data.

The analysis is based on data from the Medical Expenditure Panel Survey (MEPS) for U.S. households from 1996 to 2002. This dataset is unique for its overlapping panel design and for the detailed economic and health information it contains. It reports detailed data for each household member on demographic characteristics, income, employment and health conditions. Each household is interviewed five times over a period of two years. I use matching techniques to control for observed differences between ill and healthy individuals following Angrist (1998).

In regulatory impact analyses of health and safety regulations it is often necessary to monetize the benefits of reducing cases of heart disease, respiratory illness and cancer. This occurs, for example, in U.S. EPA analyses of air pollution regulations, which reduce heart and lung diseases (U.S. EPA, 1997, 1999 and 2005), and drinking water regulations, which often affect cancers (U.S. EPA, 1999). In the U.K. the Department for Environment, Food and Rural Affairs (DEFRA) is interested in the valuation of the costs and benefits to health and environment of food-born pathogens (Bennet et al., 2003), waste management options (Enviros and EFTEC, 2004), reduction in air pollution (EFTEC, 2004), and water quality policies (EFTEC, 2002). Hurley et al. (2005) quantify

the health effects of air pollution as part of the cost-benefit analyses effort for the Clean Air for Europe program.

Estimates of the labor market impacts of diseases related to environmental exposures constitute an important component of monetized benefits. More generally, policy makers are concerned about the consequences of serious illnesses and chronic conditions that may prevent people from working or reduce their earnings if they do work. Estimates of the magnitude of these effects are important in designing social programs such as the Old Age, Survivors and Disability Insurance program (OASDI) in the United States.

One way to quantify the benefits of reducing a disease is to apply the Cost-of-Illness (COI) approach. The COI approach calculates the direct and indirect costs avoided because of health improvements. The direct costs include medical expenses, such as medication, doctor visits, hospitalization, emergency room visits, while the indirect costs are measured in terms of productivity losses. For serious illnesses such as heart attacks and strokes, productivity losses may take the form of withdrawing from the labor force, working fewer hours, or changing occupations. All of these adjustments may reduce lifetime earnings. For less serious illnesses productivity losses may be short lived.

However, COI is likely to underestimate the benefits of reduced morbidity because it does not consider pain and suffering due to illness. In addition, the social benefits from reducing the incidence of a disease include the reduction in those costs of illness borne by the society, not just those borne by the affected individuals. For example, medical insurance spreads the costs of treatment among all policyholders, and sick leave policies shift part of the cost of lost work days on the employer and on consumers, who pay higher prices for the employer's products (Freeman, 2003).

Despite its limitations the COI approach is used by the U.S. EPA (1997, 1999, 2005), the U.S. Department of Agriculture (Buzby et al., 1996; USDA Economic Research Service, 2007) and the Centers for Disease Control and Prevention (e.g., for workplace fatality, Briddle, 2004; for diabetes, CDC, 1999) in their benefit-cost analyses. In particular, U.S. EPA studies of the costs and benefits of the Clean Air Act (U.S. EPA, 1997 and 1999) and the Clean Air Interstate Rule (U.S. EPA, 2005) COI estimates are used to value the benefits from reducing stroke, coronary heart disease, hypertension, congestive heart failure, ischemic heart disease, chronic obstructive pulmonary disease (COPD), pneumonia, and emergency room visits for asthma. The estimates of lost earnings and productivity losses are drawn from studies (Bartel and Taubman, 1979; and Cropper and Krupnick, 1989) that use data from the 1970s. The results of Bartel and Taubman (1979) and Cropper and Krupnick (1989) may not reflect current relationships between health status and labor market decisions.

Most of the literature that studies the effects of health on labor market decisions focuses on the effects of an individual's "health status," "work limitation" or "disability status" and not on specific diseases.[1] For cost-benefit analyses of specific environmental, health or safety policies, however, it is necessary to focus on particular health conditions.

In addition, although not part of a cost-benefit analysis, it is of interest to investigate the vulnerability of the household to shocks such as a sudden disease. I study the impact of certain health conditions on the spouse's labor force participation and earnings. The few studies that do examine the labor market impacts of specific diseases rarely examine the impact of an individual's disease on the labor market decisions and

[1] For example, Luft, 1975; Parsons, 1977; Lee, 1984; Berger, 1983; Chirikos and Nestel, 1981; 1984, 1985; Anderson and Burkhauser, 1984; Berger and Fleisher, 1984; Berkovec and Stern, 1991; Baldwin and Johnson, 1994; Baldwin et al., 1994; Haveman et al., 1994; Loprest et al., 1995; Wolfe and Hill, 1995; Stern, 1996; Berger and Pelwoski, 2004.

performance of family members, with the exception of Bartel and Taubman (1986) and Roberts (1999) for mental illness. I fill these gaps by studying the labor market response of a married individual to the spouse's health conditions and, as mentioned, by using recent data.

I find that all the examined health conditions reduce a married man's participation in the labor force, with the exception of chronic bronchitis and COPD. Stroke and emphysema have the largest negative effects. Having had a stroke reduces the probability of participating in the labor force by an average of 29 percentage points, while emphysema by an average of 23 percentage points. I also find that the relationship between the duration of a married man's health condition and the probability of being in the labor force is *U*-shaped. This might be due to the fact that for the people that survived the illness could have become chronic and they adjusted to it.

All the examined health conditions also significantly affect the probability of a married woman to be part of the labor force, but the effect is comparatively small: -5.8% if she had ischemic heart disease, -5.1% if she has had a stroke; -3.5% if she has had emphysema and -1.6% if she has had a severe cancer. In addition, in contrast with the results for married men, the duration of the health condition does not affect a married woman's labor force participation.

My results also suggest that if I control for how long a married man has had the health condition I find a reduction in earnings of 21.8% if a married man has had ischemic heart disease for less than one year and of 51.2% if he has had emphysema for less than one year. To illustrate, having had emphysema for less than one year is enough to reduce the earnings of a man with college degree to those of a healthy man without high school diploma. If instead I consider married women I find that the only health

condition that affects their earnings is stroke. A married woman that had a stroke experiences a 28.7% reduction in her earnings.

In order to analyze the effect of the health conditions examined on married men and women's productivity, I also consider the effect on hourly wages. I find that a married man with emphysema experiences a reduction in hourly wages of 18.5% and of about 13% if the worker has had asthma for less than one year. Similarly to married men, married women experience a reduction in their hourly wages only for two health conditions: emphysema (-43.1%) and stroke (-22.6%). Furthermore, if I control for the duration of the health condition only emphysema and chronic bronchitis affect the number of hours of work of a married man, and only stroke negatively affects the hours of work of a married woman. If a married man has had emphysema for less than one year then he experiences a reduction by 4.6 hours of work per week. To put things in perspective, in a month this is equivalent of one less part-time workweek. If for example, he has had chronic bronchitis for two years (median duration for chronic bronchitis) then he loses two hours per week, that is 100 hours per year. If a married woman had a stroke less than one year ago she experiences a reduction by about 9 hours of work per week, that is about a full time week per month.

Finally, I look at how a married woman or a married man of working age respond to the health condition of her/his spouse. I find that only if a married man has had cancer, chronic bronchitis, emphysema or COPD then the wife decision of being in the labor force is affected. Cancer has a positive small effect (2.1%) while the respiratory conditions have a negative effect. The largest effect is associated with having a husband with emphysema for less than one year (-18.7%). On the other hand, if a wife has had one of the health conditions examined her husband's probability of being a labor force

participant is not affected, with the exception of cancer. If for example, she has had severe cancer for two years her husband's probability of being in the labor force increases by about 9%. However, I find that for each additional year of illness the marginal effect of the cancer's duration is decreasing.

By exploring how the spouse's productivity is affected by the health condition of the other spouse I find that a married woman with a husband that has had cancer experiences minimum wages (-17.7%) when the husband has had the health condition for about eight years.[2] To grasp the magnitude of the effects of having cancer on wages, the effect on hourly wages of a married woman with a high school degree and a husband with cancer is equivalent to that of a married woman without a high school degree with a healthy husband.

If instead I explore the effect of a married woman's health condition on her husband's wages, then all the health conditions examined with the exception of stroke have a significant negative effect. The largest effect are associated with emphysema (-31.4% if the wife has had the condition for less than one year) and -15% if the wife has had ischemic heart disease. For comparison, the hourly wage of a white married man with some college education and a wife who has had emphysema is equivalent to that of a non-white married man without a high school degree and with a healthy wife. In addition, the wage of a non-Hispanic married man with a wife who has had ischemic heart disease is equivalent to that of a Hispanic married man with a healthy wife.

In addition, the only two health conditions that affect wives' labor supply are cancer and stroke, and their effect on the weekly number of hours of work is positive. For example, if a married man had a stroke less than a year ago then his wife works about 8

[2] Thirteen percent of men with cancer has had cancer for eight years in my sample.

hours more per month. Since women with a husband with cancer are also more likely to participate in the labor force, my results suggest that wives may have to compensate for the ensuing loss in household income by working more hours or entering the labor force. In contrast, if a married woman is sick her husband's hours of work per week are not significantly affected, with the exception of the case when the disease is emphysema. If a married man has had a wife with emphysema for less than one year he works 3.12 hours per week less, that in a year corresponds to almost a month of work less.

The reminder of this chapter is organized as follows. Section 2.2 presents an overview of the literature on the effect of health on an individual's labor market decisions and on the effect of health on the labor market decisions of other family members. It also provides a review of the policy use of the Cost-of-Illness approach. Section 2.3 describes the data and the sample selection. Section 2.4 develops the empirical models. Section 2.5 presents the results, and Section 2.6 concludes.

2.2 Literature Review

2.2.1 The Effect of Own Health on an Individual's Labor Market Decisions

A number of studies have examined the effects of health on labor market decisions (see Currie and Madrian, 1999 and Chirikos, 1993 for a review of the literature).[3] In his pioneering work Grossman (1972) treats health as a capital stock that evolves over time. It depends on past investments in health and on the rate of depreciation of health capital. Wilson (2001) emphasizes that this model does not take

[3] For example studies that address the effect of health on labor outcomes are by Grossman (1972), Berkowitz and Kingston (1974), Scheffler and Iden (1974), Luft (1975), Parsons (1977), Chirikos and Nestel (1985), Bartel and Taubman (1986), Stern (1989), Berkovec and Stern (1991), Haveman et al. (1994), Bound et al. (1995), Kreider (1996), Stern (1996), and Berger and Perlwoski (2004).

into account the fact that a disease can strike the individual suddenly and it can have permanent effects. Health conditions like asthma and diabetes can be treated but do not disappear. Currie and Madrian (1999) point out that treating health as exogenous "may not be an unreasonable assumption given that current health depends on past decisions and on habits that may be very difficult to break (e.g., smoking, or a preference for a high fat diet), and the fact that individuals often have highly imperfect information about the health production function at the time these decisions are made."

Wilson (2001) also notices that the effects of a disease vary not only in terms of severity but also in how they can alter physical functions and affect behaviour. Therefore, labor market decisions depend on the specific disease individuals contract. Since Grossman's model, as typically formulated, cannot capture these aspects of health, Wilson argues that this could explain why much of the literature ignores the "multi-dimensional, uncertain and permanent aspects of poor health" and it focuses on a general measure such as "Is your health excellent, good, fair or poor?" or on a work limitations measure such as "Does your health limit the amount or type of work you can do?"[4]

Estimates of the effects of health on labor market activity can be very sensitive to the measure of health used, and to the way in which the estimation procedure takes into account potential measurement error (Currie and Madrian, 1999). Bound (1991) shows that measurement error in self-reported health biases the coefficient on health-downwards, while the endogeneity of self-reported health may bias the estimated effect upwards. Chirikos and Nestel (1984) find that both physical impairment and low wages

[4] Example of studies that use these measures are authored by Luft, 1975; Parsons, 1977; Lee, 1984; Berger, 1983; Chirikos and Nestel, 1981; 1984, 1985; Anderson and Burkhauser, 1984; Berger and Fleisher, 1984; Berkovec and Stern, 1991; Baldwin and Johnson, 1994; Baldwin et al., 1994; Haveman et al., 1994; Loprest et al. 1995; Wolfe and Hill, 1995; Stern, 1996; Berger and Pelwoski, 2004.

are significantly positively related to the probability of reporting a work-limiting health problem.

Pelwosky and Berger (2004) emphasize that there is no consensus yet on the magnitude of the effect of health on labor outcomes, and that using health measures such as "Does health limit work" or "in the last 12 months did health limit the amount or type of work…" does not allow one to discriminate between temporary and permanent illnesses, which is important if policymakers are concerned about the long-term consequences of illness. In their study, Pelwosky and Berger address this issue by building two categories of health conditions: temporary and permanent health conditions. Using data from the Health and Retirement Study, they find that permanent illnesses have a significant negative effect on average hourly wages and in annual hours of work for both men and women, while temporary health conditions have little impact on wages and hours of work.

However, like most of the literature, this study fails to account for the effect of specific health conditions. Among the studies that have examined the effects of specific diseases, most have focused on mental health problems and alcoholism (see Benham and Benham, 1982; Ettner et al., 1997; Grzywacz and Ettner, 2000; Mullahy and Sindelar, 1991, 1993, 1994, and 1995).[5] Few studies have considered the effects of potentially environmentally-related health conditions such as respiratory and circulatory diseases. To the best of my knowledge, the only studies of the labor market effects of chronic

[5] Mitchell and Burkhauser (1990) estimate the effect of arthritis on labor market outcomes, and find that arthritis has a negative significant effect on wages and hours worked.

respiratory and circulatory diseases are by Bartel and Taubman (1979), Cropper and Krupnick (1989), Wilson (2001) and Narayan et al. (2005).[6]

Bartel and Taubman (1979) recognize that while previous research made important contributions in quantifying the losses from poor health, the health measures used were inadequate because they measured health status based on the individual's self-evaluation. They also emphasize that the other commonly used health measure, namely "number of weeks lost due to illness," may be subject to measurement error and/or recall bias since the individual has to identify the weeks lost because of illness only. Bartel and Taubman circumvent these problems by studying the effects of specific physician-diagnosed diseases on an individual's labor force participation, wage rates and hours worked using data from the National Academy of Science-National Research Council sample of white, veteran, male twins for the years 1967 and 1973.[7]

In several ways, Cropper and Krupnick (1989) advance the analysis of the effects of respiratory and circulatory health conditions on labor market decisions. They study the effect on labor market decisions of allergies, asthma, chronic bronchitis, emphysema, other chronic lung disease, arteriosclerosis, heart attack, hypertension, other chronic heart disease and stroke. They distinguish the effects of specific diseases without aggregating

[6] For completeness, it should be mentioned that there are other studies that control for specific diseases in explaining labor force participation, but it is beyond their scope to look at the effects of the specific conditions on labor force participation. Their main purpose is to test for different measures of work disability. For example, Stern (1989) presents no discussion of the effects of specific diseases on the probability of participation in the labor market, and he considers aggregate categories such as "breathing" and "heart and circulation." This reflects the main goals of the paper that are to estimate the effect of disability on labor force participation by using specific disease variables as instruments and to test for endogeneity of disability status. Similarly, Kreider (1996) uses physician-diagnosed health conditions as instruments for disability. He considers fifteen conditions including cancer, heart disease, stroke, lung and asthma. However, the main purpose of the study is to assess the degrees to which various groups of nonworkers may overreport limitation, and how reporting bias may affect inferences about the effect of disability on participation decisions.

[7] They identify eight disease categories: psychoses/neuroses, arthritis, ulcers, diseases of nerves, diseases of liver/gall-bladder/pancreas, bone diseases, chronic bronchitis/emphysema/asthma, and heart disease/hypertension.

chronic bronchitis, emphysema and asthma into one category, and heart disease and hypertension into another category as Bartel and Taubman (1979) do. They use data from the 1978 Social Security Survey of Disabled and Non-Disabled Adults to examine the effects of chronic illness on labor force participation and on earnings of men age 18-65. They also examine how the effect of each disease varies with age of onset and with duration. Furthermore, they compute the labor market costs of chronic respiratory and circulatory diseases and they compare these with medical costs, estimated using the National Medical Care Expenditure Survey.

Most recently Wilson (2001) emphasizes that "the more is learnt about the role played by specific health conditions upon behavior, the better prepared society will be to allocate public investment in the prevention and treatment of the disease." He uses data from the 1991 New Jersey Demographics of Disability Survey to study the effect of specific chronic health conditions on labor force participation, and the role of comorbidity on the probability of employment. Unlike Cropper and Krupnick (1989), Wilson studies the effects of various heart conditions as a broad category; he includes chronic bronchitis in the category "other respiratory conditions" together with tuberculosis, and does not control for duration or age of the individual at onset of the diseases. He restricts attention on labor force participation. He distinguishes between men and women, and he studies the effect of cancer on labor force participation.

The most recent study about the effects of respiratory and circulatory diseases on labor market decisions was authored by Narayan et al. (2005). They examine the effects of chronic illnesses on an individual's labor force participation, occupational choice and hours worked, utilizing cross-sectional data from the 1998-2000 California Work and Health Survey for people aged 18-65. They examine specific health conditions but, as in

Wilson (2001), do not distinguish between specific heart and respiratory diseases such as stroke, ischemic heart disease, emphysema and chronic bronchitis. The diseases studied include heart problems, hypertension, lung disease, asthma, cancer, kidney disease, ulcer, back trouble and migraines. Unfortunately, due to data limitations, Narayan et al. (2005) cannot measure the impact of disease on earnings, nor can they control for duration or onset of the disease.

2.2.2 The Effect of Health on the Labor Market Decisions of Other Family Members

Most of the literature that studies the effect of an adult's health on labor market decisions has focused on the effects of an individual's health on his own participation and earnings. Fewer papers have looked at the effect of a person's health on the labor market decisions of other family members.[8] Most of these studies consider the effect of a common health aggregator variable, such as "health status," "work limitation" or "disability status," on other family members.

For example, Parsons (1977) studies the effect of wives' health, measured in terms of activity limitation, on married men's hours of work using the 1966 cohort of males aged 45-59 from the National Longitudinal Survey (NLS). He finds that husbands work an average of about 100 fewer hours a year than they would have if the wife had been healthy. He also uses time budget data from the 1965 Productive Americans Survey for married men aged 45-64 and married women aged 40-64. In contrast with the previous result, he finds that wife's work-limiting condition induces a modest and statistically insignificant increase in the husband's hours of work (of about 30 hours a year). A husband's work-limiting health condition has a positive and slightly significant

[8] See Currie and Madrian (1999) for a summary of the literature.

effect on the wife's hours of work totaling about 140 additional hours. The same author recognizes that the variable "work-limiting health condition" should be considered with caution in a labor supply study because for the NLS sample "many with a work-limiting condition, however, felt themselves in good and even excellent health."

Berger (1983) explores the effect of death, illness and disability of one spouse on the labor supply of the other spouse using the 1978 March Current Population Survey of individuals aged 35-64. He defines as ill those spouses who worked at least one week but cited poor health as the major reason for not working the entire year. He defines as "disabled" those spouses who did not work at all during the year of interview and gave poor health as the main reason. The author recognizes that these health variables are not without problems since only those who worked less than the full year can be classified as having health problems. Thus, an individual with a handicap working full time is not considered disabled.[9]

Some recent studies have explored labor force transitions of married individuals in response to changes in the health of family members in the U.S. using the Health Retirement Study (for example, Johnson and Favreault, 2001; Pienta, 2003; and, Berger and Pelkowsky, 2004), while Boaz and Muller (1992), Ettner (1995a, b), and Wolf and Soldo (1994) have looked at the effect of elderly parents on the labor market decisions of their adult children.

None of these studies has looked at the effect of specific adults' health conditions on the labor market decision of other family members. To the best of my knowledge, the few studies that explore this effect focus on mental illness. For example, Bartel and

[9] He finds that the wife works more and she is more likely to participate in the labor market if the husband dies or if he is in poor health, while a husband reduces both labor force participation and hours of work when his wife dies or when she is in poor health. Similar results are found by Berger and Fleisher (1984) using the National Longitudinal Survey.

Taubman (1986) examine the effect of mental illness on wives' labor force participation, while Roberts (1999) investigates the effect of the presence of mental illness in the family on the labor force participation and labor supply of both women and men. Furthermore, there are no studies that have estimated the costs of ill health on the labor market outcomes of the other family members.

The studies above reviewed restrict attention to the relationship between an adult's health and his or her-or another *adult*'s-labor market decisions. There is also growing evidence that *children*'s poor health can affect parents' labor market outcomes. Having a child in poor health generates additional time and budget constraints which affect parents' labor supply and labor force participation. Powers (2003) provides a summary of the literature on the effects of a child in poor health on the labor market decisions of mothers. Most of the studies she reviews found that the presence of a disabled child in the household reduces mothers' labor force participation (for example, Salkever, 1990; Wolfe and Hill, 1995; Lukemeyer et al, 2000; Kuhthau and Perrin, 2001; and Powers, 2001). However, Breslau et al. (1982) find a negative effect only for poor or black married mothers, and Salkever (1982), Kimmel (1997 and 1998), Acs and Loprest (1998) report insignificant effect on the labor force participation of single mothers. There is also no consensus on the effect of a child health on parents' labor supply. Salkever (1982 and 1990) finds no evidence of an association between a child's health and mothers' hours of work, while Powers (2003) finds a negative significant effect. Gould (2004) finds that single mothers work fewer hours if the child has a health condition whose treatment is very time consuming, while married mothers work fewer hours if their child has a health condition that requires care at unpredictable times of the day.

Most recently, Corman et al. (2005a, b) find that (i) mothers' labor force participation decision is negatively related with having a child in poor health, and that mothers of children in poor health work about four hours a week less than the others; (ii) having a young child in poor health reduces fathers' probability of participating in the labor force by eight percentage points and it reduces their hours of work by over five hours per week. However, Corman et al. (2005a, b) focus on the low end of the socioeconomic spectrum. The sample used for this analysis is the Fragile Families and Child Wellbeing Study, and attention is restricted to extreme conditions, which are experienced by only six percent of the children.[10]

Two possible reasons for the discrepancies in the literature can be the small number of ill individuals and the use of different definitions of disability across studies (Powers, 2003).

2.2.3 Policy Use of the Cost-of-Illness Approach

Cost-of-Illness (COI) studies measure the direct and indirect costs resulting from an illness. Direct costs are those relate to the use of medical care, such as expenditures for hospitalization, doctor visits, drugs, or nursing home care.[11] Indirect costs include the value of time lost from work, lost earnings and productivity (Segel, 2006). COI studies provide a monetary estimate for the economic impact of diseases, which can be used to inform policy decisions makers. However, COI estimates do not capture some intangible costs such as pain and suffering, emotional and psychological impacts on families, friends, and co-workers.

[10] They consider a child to have poor health if at least one of the following criteria is met: the child weighed less than 4 pounds at birth, the mother reported at follow-up that the child had a disability, or the child was neither walking nor crawling by the time of the follow-up interview 12 to 18 months.

[11] For an exhaustive presentation of the direct medical costs resulting from illnesses that are associated with exposure to pollutants see "The Cost of Illness Handbook" (U.S. EPA, 2007).

For example, in response to a request from the U.S. Congress, the National Institutes of Health (NIH) released a 2000 report on the updated costs of illness for numerous diseases (Kirschstein, 2000).[12] Most of the COI estimates are estimated by using the prevalence-based approach, which provides an estimate of the direct and indirect cost incurred by all cases that existed during a specified period of time (year). Some inconsistencies are observed, in that the COI estimates for some diseases include only treatment costs while others also include the value of lost productivity.

The COI approach has been used in many contexts in order to answer questions such as "Which health problems should be address first and what intervention should be used in order to alleviate them?" "Are the benefits of a government program worth its costs?" COI estimates can also show the financial impact a disease has on public programs, such as Medicare and Medicaid. For example, Finkelstein et al. (2003) show that the annual medical expenses related to overweight and obesity in U.S. adults is about $93 billion and that half of this cost is financed by Medicare and Medicaid.[13] Smoking Cost-of-Illness estimates by Bartlett et al. (1994) were used in state lawsuits against the tobacco industry in U.S. to recover Medicaid losses (Warner et al., 1999). These estimates include only direct costs attributable to smoking, such as prescription drugs, hospitalizations, physician care, home-health care, and nursing-home care.[14,15]

[12] The diseases examined include the top 15 causes of mortality as defined by the Centers for Disease Control and Prevention (CDC), 46 other diseases for which NIH Institutes and Centers have presented cost estimates in testimony, official reports, or speeches; and health conditions for which cost estimate was available and important components of NIH's research portfolio.

[13] The study examined a representative sample of 9,867 adults ages 19 and older, with data from the 1998 Medical Expenditure Panel Survey and the 1996 and 1997 National Health Interview Surveys.

[14] The estimates are based on the 1987 National Medical Expenditures Survey (NMES-2) and the Health Care Financing Administration (HCFA).

[15] Total medical-care expenditures attributable to smoking are $21.9 billion. Public funding (i.e., Medicare, Medicaid, and other federal and state sources) are 43.3% of the total medical-care expenditures. "For each of the approximately 24 billion packages of cigarettes sold in 1993, approximately $2.06 was spent on medical care attributable to smoking. Of the $2.06, approximately $0.89 was paid through public sources" Bartlett et al. (1994).

Another example of policy use of COI is represented by a study of the cost of injuries by Rice et al. (1989).[16] This study has been used to motivate the U.S. Centers for Disease Control and Prevention (CDC) requests for proposals for injury centers. The lifetime economic cost include the direct cost for medical treatment and rehabilitation of patients injured in 1985, and the indirect costs associated with loss of earnings due to short and long-term disability and premature death.[17]

In environmental policy COI estimates are cited in cost-benefits studies, such as the retrospective studies of the U.S. EPA on the costs and benefits of the Clean Air Act (U.S. EPA, 1997 and 1999) and of the Clean Air Interstate Rule (U.S. EPA, 2005). In these reports the COI approach is used in the case of hospital admissions avoided because of lack of information regarding the willingness to pay to avoid illnesses that require hospital admissions, namely stroke, coronary heart disease, hypertension, congestive heart failure, ischemic heart disease, COPD, pneumonia events, and emergency room visits for asthma. In the case of stroke direct and indirect costs of the illness are considered, including the present discounted value of the medical expenditures and lost earnings and productivity related to the illness. In all the other cases COI estimates do not

[16] The examined injuries are from motor vehicles, falls, firearms, fires and burns, drawings, poisonings and from all other causes.

[17] Direct personal medical and nonmedical costs of care for injured persons are $44.8 billion. $24.5 billion (55%) of the total direct costs are for hospital care, including rehabilitation and the cost of professional services provided to hospitalized patients. Physician visits outside of hospitals ($6.5 billion) and nursing-home care ($2.5 billion) are the second and third highest direct cost expenditures. In 1985, morbidity losses included 5.1 million productive life years or 9 life years lost per 100 injured persons. (Productive life years are derived from the number of years lost from work by employed persons and from performance of housekeeping services by those who perform them as their major activity). These losses represented a cost of $64.9 billion, or $1145 per injured person. Injury fatalities resulted in losses of 5.3 million life years and $47.9 billion. Private sources (e.g., private health insurance, workers' compensation, uninsured care) paid approximately 72% of the direct cost; public sources (federal, state, and local governments) accounted for 28%. Medicare and other public sources paid 72% of the direct costs for injured persons aged greater than or equal to 65 years. For injured persons aged less than 65 years, however, private health insurance and other private funds paid 85% of the direct costs.

include lost productivity, they include the medical costs and the opportunity cost of time lost from work.

The USDA Economic Research Service provides a COI calculator that estimates the costs of illness and premature death for foodborne illnesses, which can be used in cost-benefits analyses (USDA Economic Research Service, 2007). The COI approach was used in the cost-benefit analysis for the Clean Air for Europe program to assess the hospital health care costs and the costs to business of absenteeism (Hurley et al., 2005). The total cost of absence per employee is based on the salary costs of absent workers, replacement costs (e.g., employment of temporary staff), lost service or production time and indirect costs such as lower customer satisfaction and poorer quality of products or services leading to a future loss of business. In the U.K. the Department for Environment, Food and Rural Affairs (DEFRA) commissioned a study to assess the external costs and benefits to health and environment of different waste management options (Enviros and EFTEC, 2004). COI estimates were used to assess the costs of cancer and cardiovascular hospital admissions inclusive of foregone earnings and cost of hospitalisation.

2.3 Data Description

To estimate the effect of a married man's illness on his and his wife's labor force participation, earnings, and hours of work, I looked for a large dataset with detailed information on employment and demographic characteristics of both spouses, plus detailed data on the health condition of the husband. I use the Medical Expenditure Panel Survey (MEPS) to estimate these effects. The Agency for Healthcare Research and Quality (AHRQ) and the National Center for Health Statistics (NCHS) sponsor the Medical Expenditure Panel Survey. MEPS began in 1996 and included a sample of 9,000

households and 21,571 individuals. In 1997, the MEPS sample increased to 13,000 households and 32,626 individuals and in 2001 the sample size was increased 35% over the previous year's survey to improve the precision of survey estimates.

MEPS is characterized by an overlapping panel design: each year a new panel of households is introduced into the survey. There are five rounds of data collection over the course of a two-year period of time. The MEPS sample is drawn from a nationally representative subsample of households who participated in the National Health Interview Survey (NHIS) in the previous year. However, each panel oversamples Hispanics and African Americans, and persons in low-income households have been oversampled in panel 2 and starting with panel 7.

Data are collected at the individual and household levels. All data are reported in person by a single respondent for the household in the course of a personal interview. MEPS is unique for its detailed economic and health information. It includes detailed data for each household member and for the household on demographic characteristics (such as age, race/ethnicity, sex, marital status, and family relationships), income, employment information (such as employment status, hours worked per week, hourly wages, occupation, and industry), health conditions, health status, use of medical care services, charges and payments, access to and usage of medical care, satisfaction with care, and health insurance coverage.

Health conditions are identified by International Classification of Diseases (ICD9) codes. An individual in the sample is considered to have a condition if (i) during the interview it has been reported that he/she has the condition; (ii) if the individual's disability days (e.g., missing days of work, spending days in bed) are related to the condition; or (iii) if the individual had an event associated with the condition, such as a

hospital inpatient stay, an emergency room visit, an outpatient visit, an office-based provider visit, prescription medicine purchases, or other medical expenses.

Health care providers (doctors, hospitals and home health agencies) are contacted by telephone to supplement or replace household-reported information that household respondents cannot accurately provide (such as dates of visit, diagnosis and procedure codes, charges and payments). Certain conditions were a priori coded as "priority conditions," due to their prevalence, expense, or relevance to policy, using a list provided by the sponsor agency AHRQ (Agency for Healthcare Research and Quality). Some of the "priority conditions" are long-term life-threatening conditions, such as cancer, diabetes, emphysema, high cholesterol, HIV/AIDS, hypertension, ischemic heart disease, and stroke. Others are chronic manageable conditions, including arthritis, emphysema, chronic bronchitis, COPD, asthma, gall bladder disease, stomach ulcers, and back problems. The list of "priority conditions" also includes mental illnesses. For each of these conditions the date when the condition began is provided. This allows me to infer how long the individual has had the condition.

Finally, to fully account for all factors affecting participation in the labor force and work hours, I have merged MEPS data with community socioeconomic variables measured at the county level, such as the unemployment rate in the household's county of residence, and annual average weekly wage in the household's county of residence. This information is drawn from the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) program and Local Area Unemployment Statistics (LAUS) program (BLS 2007a, 2007b). All dollar values were converted to 2002 dollars using the annual average Consumer Price Index (BLS, 2007c).

2.3.1 Sample Selection and Data Matching

My analysis is based on years 1996-2002. The initial sample size is of 203,817 observations. Since one of the objectives of my research is to study how specific health conditions affect the earnings of married couples I exclude the panels with oversampling of low-income households (that is panels 2, 7, 8 and 9; 87,719 observations deleted and sample size of 116,098).[18]

Since part of the purpose of this research is also to study whether being married to a person with a chronic health condition influences the labor market decisions of the spouse, single persons are excluded. I select only married couples with both husband and wife present in the household (10,674 observations deleted and sample size of 105,424). I also exclude couples (i) where both partners are disabled (1,934 observations deleted and sample size of 103,490 observations) or (ii) retired (19,284 observations deleted and sample size of 84,206 observations), (iii) at least one of the spouses is a student (1,622 observations deleted and sample size of 82,584 observations) or (iv) at least one of the spouses is less than 18 years old (166 observations deleted and sample size of 82,418 observations).[19,20] I further drop the observations where education or income of at least one of the spouses is missing (10,216 observations deleted and sample size of 72,202 observations). In order to estimate the effect of an individual health condition on own and the spouse's labor market decisions, I build two samples. The first sample includes only men of working age (less than 65 years old) married with a woman older than 18, and it has 58,029 observations (13,355 individuals). The second sample includes only women

[18] However, Tables A14 and A15 in Appendix A present the results by using all the panels (years 1996-2004).
[19] I define as disabled the individual who declared that the main reason why he/she is not working is because he/she is unable to work because ill or "disabled."
[20] Note that "observations" refers to the number of people in the sample multiplied by the number of times each is interviewed.

of working age (less than 65 years old) married with a man older than 18, and it has 60,216 observations (13,873 individuals).

For the purpose of this study, I have selected cancer, stroke, ischemic heart disease, emphysema, chronic bronchitis, COPD, and asthma because these conditions are relevant to environmental policy (they have been linked with exposure to certain pollutants). An individual is defined as ill if he/she has at least one of these conditions, while he/she is defined as healthy if he/she does not have any of these health conditions. Table A1 in Appendix A provides a definition of each health condition. The variable "cancer" includes non-melanoma skin cancers. However, in order to examine the effect of the most serious types of cancers I create the variable "severe cancer," which excludes non-melanoma skin cancers (ICD9 codes 173 and 233).

Table 1 presents the percentage of married men and women in the two samples with each condition. The most common conditions are cancer, COPD, chronic bronchitis and asthma both for married men and married women of working age. For example, 3.32% of the sample of married men of working age have or have had cancer, 4.46% COPD, 4.09% chronic bronchitis and 2.41% asthma. About 33% of ill married men (501 married men) and about 39% of ill married women (834 married women) have or have had more than one of the health conditions examined. Tables 2 and 3 show the distribution of the health conditions by round of interview. About 54% of the men with cancer are diagnosed to have this illness during the MEPS study period. About 46% of the men with cancer report having this illness already during their first MEPS interview, 18% developed cancer between the first and the second round of interview, 15% between the second and the third round of interview, 12% between the third and the fourth round of interview, and 8% between the fourth and fifth round of interview. Fifty-four percent

of married men that had a stroke had a stroke after the first round of interview (48 individuals); 24% of married men who have had emphysema developed emphysema after the first round of interview; 36% of married men who have had ischemic developed ischemic hearth disease after the first round of interview; 72% of married men who have had COPD developed COPD after the first round of interview (368 individuals), and 24% of married men who has had asthma developed asthma after the first round of interview.

Table 1 – Husbands' and Wives' Health Conditions

Sample of Married Men 18-64 with a Wife Older than 18

	Husband's Health Condition						**Wife's Health Condition**					
	Total		Health Condition's Duration				Total		Health Condition's Duration			
	Freq.	%	Mean	Median	Min	Max	Freq.	%	Mean	Median	Min	Max
Cancer	444	3.32	3.03	1	0	41	615	4.61	3.29	2	0	24
Sever cancer	326	2.44	2.94	1	0	22	526	3.94	3.31	2	0	23
Stroke	88	0.66	2.76	1	0	23	54	0.40	2.44	1	0	21
Ischemic Heart Disease	225	1.68	4.00	2	0	30	92	0.69	2.96	1	0	28
Emphysema	58	0.43	6.49	4	0	29	30	0.22	4.33	3	0	16
Chronic Bronchitis	546	4.09	4.28	2	0	42	916	6.86	4.07	1	0	54
COPD	595	4.46	5.05	2	0	42	932	6.98	4.15	1	0	54
Asthma	322	2.41	16.98	14	0	63	554	4.15	14.37	9	0	60
Total number of individuals	13,355						13,355					

Sample of Married Women 18-64 with a Husband Older than 18

	Husband's Health Condition						**Wife's Health Condition**					
	Total		Health Condition's Duration				Total		Health Condition's Duration			
	Freq.	%	Mean	Median	Min	Max	Freq.	%	Mean	Median	Min	Max
Cancer	540	3.89	3.19	1	0	41	657	4.74	3.24	2	0	24
Sever cancer	403	2.90	3.02	1	0	22	558	4.02	3.22	2	0	23
Stroke	108	0.78	2.68	1	0	15	62	0.45	2.25	1	0	29
Ischemic Heart Disease	267	1.92	4.83	3	0	34	95	0.68	3.15	1	0	21
Emphysema	86	0.62	6.76	5	0	35	32	0.23	3.87	3	0	12
Chronic Bronchitis	585	4.22	4.23	2	0	42	964	6.95	4.24	1	0	55
COPD	657	4.74	5.15	1	0	42	981	7.07	4.22	1	0	55
Asthma	337	2.43	17.28	15	0	72	589	4.25	14.49	9	0	63
Total number of individuals	13,873						13,873					

Notes: The two samples refer to the 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old. The first sample also excludes married men older than 64, while the second sample excludes married women older than 64. Table A1 in Appendix A presents the definition of each condition.

Table 2 – Married Men's Health Conditions by Round of Interview

Sample of Married Men 18-64 with a Wife Older than 18											
	Round of Interview										
Husband's Health Condition	1		2		3		4		5		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	**Total**
Cancer	205	46.22	79	17.85	68	15.33	54	12.13	38	8.47	444
Severe Cancer	149	45.77	59	18.18	51	15.67	37	11.29	30	9.09	326
Stroke	40	45.98	17	19.54	14	16.09	11	12.64	5	5.75	88
Ischemic Heart Disease	145	64.25	15	6.79	21	9.50	25	11.31	18	8.14	225
Emphysema	44	76.67	7	11.67	2	3.33	2	3.33	3	5.00	58
Chronic Bronchitis	185	33.96	100	18.30	145	26.60	66	12.08	49	9.06	546
COPD	227	38.21	105	17.73	143	24.10	68	11.36	51	8.61	595
Asthma	246	76.27	24	7.46	25	7.80	16	5.08	11	3.39	322

Notes: The sample refers to the 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old, and (v) married men older than 64. Table A1 in Appendix A presents the definition of each condition.

The percentages of married women in working age who developed a health condition after the first round of interview are, respectively, 53% cancer, 52% severe cancer, 55% stroke, 40% ischemic heart disease, 28% emphysema, 66% chronic bronchitis, 65% COPD, and 21% asthma.

Table 3 – Married Women's Health Conditions by Round of Interview

Sample of Married Women 18-64 with a Husband Older than 18											
	Round of Interview										
Wife's Health Condition	1		2		3		4		5		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	**Total**
Cancer	310	47.14	102	15.55	95	14.40	98	14.89	53	8.02	657
Severe Cancer	268	48.08	85	15.19	85	15.19	76	13.65	44	7.88	558
Stroke	28	45.76	14	22.03	7	11.86	9	15.25	3	5.08	62
Ischemic Heart Disease	57	59.55	15	15.73	16	16.85	5	5.62	2	2.25	95
Emphysema	23	71.88	3	9.38	0	0.00	3	9.38	3	9.38	32
Chronic Bronchitis	325	33.66	169	17.55	244	25.28	116	12.03	111	11.48	964
COPD	343	34.96	170	17.32	241	24.57	117	11.90	110	11.26	981
Asthma	464	78.82	44	7.55	42	7.18	21	3.50	17	2.95	589

Notes: The sample refers to the 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old, and (v) married women older than 64. Table A1 in Appendix A presents the definition of each condition.

Tables 4 and 5 present the descriptive statistics of the sample of married men in working age with a wife older than 18 and the sample of married women with a husband older than 18. In my samples the average man is 43 years old, he has a high-school degree, he is white, Hispanic, he leaves in a metropolitan statistical area, and he is married with a younger woman (41 years old) of the same education level, race and ethnicity. Furthermore, seven percent of healthy married men in working age versus 5% of ill married men in working age changed their current main job and had a new current main job at least once during the interview period. Seven percent of married men in working age with a healthy wife versus 5.5% of married men with an ill wife changed their current main job at least one during the interview period.

If I consider the sample of married women in working age 4.8% of healthy married women versus 4.2% of ill married women changed their current main job and had a new current main job at least one during the interview period. On the other hand, the percentage of married women in working age who changed their current main job at least once during the interview period and have an ill husband (4.4%) is not statistically different from the percentage of married women who changed their current main job at least once during the interview period and have a healthy husband (4.8%).[21]

[21] The z-statistic for the test of equality of proportions is 1.42.

Table 4 – Descriptive Statistics: Sample of Married Men 18-64 with a Wife older than 18

	Total Sample		Healthy Married Men		ill Married Men	
Variables	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Dependent Variables						
Husband participating	0.931	0.254	0.936	0.244	0.818	0.386
Husband's Weekly Earnings	861.575	593.531	860.589	595.660	885.141	539.694
Husband's Hourly Wage	19.129	12.088	19.095	12.138	19.942	10.792
Husband's Weekly Hours of Work	44.419	9.895	44.447	9.884	43.754	10.153
Husband's Characteristics						
Age	43.232	10.631	43.003	10.574	47.956	10.726
Age 25-34	0.214	0.410	0.218	0.413	0.127	0.333
Age 35-44	0.313	0.464	0.317	0.465	0.223	0.416
Age 45-54	0.271	0.444	0.269	0.444	0.303	0.460
Age 55-64	0.177	0.382	0.170	0.376	0.334	0.472
Years of education	12.779	3.187	12.763	3.196	13.104	2.985
High-school degree	0.334	0.472	0.334	0.472	0.328	0.469
Some college	0.198	0.398	0.198	0.398	0.199	0.399
College	0.268	0.443	0.266	0.442	0.302	0.459
Non-white	0.138	0.345	0.139	0.346	0.104	0.305
Hispanic	0.220	0.414	0.225	0.418	0.111	0.314
Served in the military	0.208	0.406	0.203	0.402	0.299	0.458
Wife's Characteristics						
Age	41.082	10.494	40.879	10.446	45.278	10.600
Age 25-34	0.245	0.430	0.249	0.432	0.163	0.370
Age 35-44	0.327	0.469	0.331	0.470	0.258	0.438
Age 45-54	0.260	0.439	0.256	0.436	0.337	0.473
Age 55-64	0.112	0.315	0.107	0.309	0.205	0.404
Age 65+	0.006	0.080	0.006	0.078	0.013	0.114
Years of education	12.745	3.043	12.736	3.058	12.933	2.687
High-school degree	0.339	0.473	0.337	0.473	0.362	0.481
Some college	0.231	0.422	0.230	0.421	0.250	0.433
College	0.242	0.428	0.242	0.428	0.231	0.421
Non-white	0.137	0.344	0.139	0.346	0.103	0.304
Hispanic	0.222	0.416	0.227	0.419	0.119	0.323
Served in the military	0.011	0.104	0.011	0.104	0.012	0.109
Household's Characteristics						
Number of children age05	0.399	0.701	0.405	0.705	0.283	0.614
Number of children age611	0.430	0.729	0.435	0.731	0.339	0.664
Number of children age1217	0.401	0.712	0.406	0.716	0.310	0.620
Transfer income/1000	1.190	4.525	1.134	4.417	2.339	6.261
Non-transfer income/1000	1.296	4.763	1.283	4.746	1.562	5.108
Area Characteristics						
Non-MSA	0.224	0.417	0.223	0.416	0.257	0.437
Unemployment rate by county	5.106	2.825	5.113	2.840	4.962	2.487
Average weekly wage by county/100	6.056	1.587	6.061	1.590	5.939	1.519
Total Observations	58,029		52,680		5,349	

Notes: The sample refers to the 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old; and (v) married men older than 64. A married man is defined as "ill" if he has at least one of the following conditions: cancer, stroke, ischemic heart disease, asthma, chronic bronchitis or COPD. A married man is healthy if he does not have any of these health conditions. Tables A1 and A2 in Appendix A respectively present the definition of each condition and of the variables.

Table 5 – Descriptive Statistics: Sample of Women Aged 18-64 with a Husband over 18

	Total Sample		Healthy Married Women		ill Married Women	
Variables	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Dependent Variables						
Wife participating	0.743	0.437	0.745	0.436	0.723	0.447
Wife's Weekly Earnings	577.016	406.399	575.779	405.634	596.138	417.634
Wife's Hourly Wage	14.858	8.697	14.828	8.690	15.332	8.792
Wife's Weekly Hours of Work	37.850	11.015	37.852	11.009	37.809	11.106
Husband's Characteristics						
Age	44.207	11.583	44.002	11.565	47.341	11.413
Age 25-34	0.206	0.404	0.211	0.408	0.133	0.339
Age 35-44	0.302	0.459	0.304	0.460	0.265	0.441
Age 45-54	0.260	0.439	0.258	0.437	0.300	0.458
Age 55-64	0.166	0.372	0.161	0.368	0.232	0.422
Age 65+	0.043	0.202	0.041	0.199	0.060	0.237
Years of education	12.739	3.224	12.734	3.234	12.812	3.073
High-school degree	0.332	0.471	0.331	0.471	0.351	0.477
Some college	0.195	0.396	0.195	0.396	0.197	0.398
College	0.267	0.442	0.267	0.442	0.263	0.440
Non-white	0.139	0.346	0.142	0.349	0.106	0.307
Hispanic	0.217	0.412	0.222	0.415	0.138	0.345
Served in the military	0.223	0.416	0.219	0.414	0.282	0.450
Wife's Characteristics						
Age	41.671	10.763	41.459	10.742	44.901	10.561
Age 25-34	0.236	0.425	0.241	0.428	0.163	0.370
Age 35-44	0.316	0.465	0.318	0.466	0.289	0.453
Age 45-54	0.256	0.437	0.253	0.435	0.308	0.462
Age 55-64	0.143	0.350	0.138	0.345	0.216	0.412
Years of education	12.714	3.060	12.708	3.072	12.811	2.866
High-school degree	0.339	0.473	0.339	0.473	0.341	0.474
Some college	0.229	0.420	0.229	0.420	0.241	0.428
College	0.239	0.426	0.240	0.427	0.232	0.422
Non-white	0.138	0.345	0.140	0.348	0.107	0.309
Hispanic	0.219	0.413	0.224	0.417	0.136	0.343
Served in the military	0.011	0.102	0.010	0.102	0.012	0.107
Household's Characteristics						
Number of children age05	0.386	0.693	0.393	0.698	0.265	0.593
Number of children age611	0.416	0.720	0.421	0.722	0.337	0.683
Number of children age1217	0.390	0.704	0.392	0.705	0.355	0.684
Transfer income/1000	1.484	5.118	1.443	5.051	2.108	6.020
Non-transfer income/1000	1.343	4.854	1.334	4.825	1.472	5.273
Area Characteristics						
Non-MSA	0.225	0.418	0.224	0.417	0.238	0.426
Unemployment rate by county	5.104	2.807	5.112	2.829	4.982	2.446
Average weekly wage by county/100	6.056	1.593	6.060	1.597	5.995	1.528
Total observations	60,216		52,809		7,408	

Notes: The sample refers to the 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old; and (v) married women older than 64. A married woman is defined as ill if she has at least one of the following conditions: cancer, stroke, ischemic heart disease, asthma, chronic bronchitis or COPD. A married woman is healthy if she does not have any of these health conditions. Tables A1 and A2 in Appendix A respectively present the definition of each condition and of the variables.

Tables 4 and 5 show that the sample of ill individuals is characterized by a significant (at 1% significant level) higher proportion of white and non-Hispanic individuals than the healthy sample.[22] In addition, an ill married person is significantly older (at 1% statistical level) and more educated than a healthy person.[23] Ninety (eighty-nine) percent of ill married men (women) is white versus 86% of healthy married men (women). Eighty-nine (eighty-six) percent of ill married men (women) is Hispanic versus 77.5% of healthy married men (women). An ill married man (woman) is on average 47 (45) years old and has 13 years of education while a healthy married man (woman) is 43 (41) years old and has 12.7 years of education.

Following Angrist (1998) and Angrist and Krueger (1999), let's denote with Y_{i0} what someone would for example earn if he/she healthy and with Y_{i1} the earnings of an ill individual. Since I never observe both potential outcomes, Y_{i0} and Y_{i1} for any one person, it makes sense to focus on expectations. One possibility is the "average treatment effect," $E[Y_{i1} - Y_{i0}]$, but this is not the best choice since people that are ill tend to have personal characteristics that differ, on average, from those of people who are "healthy." Simply comparing the earnings of ill and healthy individuals is unlikely to provide a good estimate of the effect of the health condition on the earnings of the individual. The comparison by health status is

$$E[Y_{1i} \mid D_i = 1] - E[Y_{oi} \mid D_i = 0] =$$
$$E[Y_{1i} - Y_{oi} \mid D_i = 1] + \{E[Y_{oi} \mid D_i = 1] - E[Y_{oi} \mid D_i = 0]\}.$$

[22] The z-statistics for the test of equality of proportions are -7.5101 for white and -20.2114 for non-Hispanic in the sample of married men with a wife older than 18, and -8.3887 for white and -18.3805 for non-Hispanic in the sample of married women with a husband older than 18.

[23] t-test statistics are -33.4376 for age and -7.6312 for education in the married men sample, and -26.7435 for age and -2.8168 for education in the married women sample. Ill individuals are older than the healthy ones because among the health conditions that define a married person as ill I included diseases that are more likely to affect people when they become older (e.g., emphysema and stroke).

where D_i is equal to 1 if the individual is ill and 0 if he/she is "healthy." This equation is the average causal effect of the health status, $E[Y_{1i} - Y_{oi} \mid D_i = 1]$, plus a bias term attributable to the fact that the earnings of healthy individuals are not necessarily representative of what ill individuals would have earned if they had not been "ill."

Ideally, to examine the effect of illness on labor market outcomes, one would like to randomly assign the illnesses here studied to individuals, and to compare pre- and post-illness labor market outcomes for those persons who received an illness and those who did not. It is clear that this is not possible, so I sample retrospectively from the cases (ill individuals) and controls (healthy individuals). I implement a matched case-control study by using a data matching algorithm (Cook and Campbell, 1979) that matches the ill individuals to the healthy individuals by age, education, race and ethnicity. The data matching algorithm consists of the following steps:

1. Define as ill every married man in the sample with at least one of the following conditions: cancer, severe cancer, stroke, ischemic heart disease, emphysema, chronic bronchitis, COPD or asthma. Define as healthy an individual who does not have any of these conditions.
2. Sort the sub-samples of ill individuals and of healthy individuals by exogenous characteristics of the individual, specifically by age group (age 18-24, age 25-34, age 35-44, age 45-54, age 55-64, age 65 plus), education category (no high school degree, high school degree, some college, college degree), race (white, non-white) and ethnicity (Hispanic, non-Hispanic).
3. Match the ill sub-sample with the healthy sub-sample by age, education, race and ethnicity: in other words, randomly select from each stratum of the

healthy sub-sample created in step 2 observations equal to the number of observations of the corresponding stratum of the ill sub-sample.

This data matching algorithm results in the same number of ill and healthy individuals for each combination of age, education, race and ethnicity. In order to study the effect of a person's health condition on own labor market decisions I build two samples: in the first sample ill married men match healthy married men by age, education, race and ethnicity; in the second sample ill married women match healthy married women by age, education, race and ethnicity. The first sample consists of a total of 3,016 married men (1,508 ill and 1,508 healthy) and 13,347 observations. The second sample consists of a total of 4,246 married women (2,123 ill and 2,123 healthy) and 18,615 observations.

Table 6 presents the descriptive statistics for these two matched samples and Part I of Tables 7 and 8 the percentage of married men and women by each health condition. For example, 14.72% of the sample of husbands have cancer, 18.10% have chronic bronchitis, 19.73% have COPD, and 10.68% have asthma. As Tables 5 and 6 show, the rates of cancer, stroke, ischemic heart disease and stroke increase sharply with age, but the rates of chronic bronchitis, COPD and asthma decrease with age.[24] As expected, very few cases of stroke, ischemic heart disease and emphysema appear in men less than 35 years old.

It is possible to apply the matching algorithm to look at the effects of an ill spouse on the other spouse's labor market decisions. To do so, I build two samples

[24] The fact that the rates of chronic bronchitis and COPD decrease by age might be related to smoking cessation and asthma reduction. The Centers for Disease Control and Prevention (CDC) cites tobacco smoking and asthma as key factors in the development and progression of COPD and chronic bronchitis (CDC, 2003).

where I respectively match married women (men) of working age with an ill husband (wife) with married women (men) with a healthy husband (wife) by age, education, race and ethnicity. The first matched sample consists of 3,400 married women (1,700 with an ill husband and 1,700 with a healthy husband), which correspond to 14,825 observations. The second matched sample consists of 4,010 married men (2,005 with an ill wife and 2,005 with a healthy wife), which correspond to 17,718 observations. Tables 6, 7 and 8 present the descriptive statistics. For example, 15.34% of the husbands have a wife with cancer, 23.24% with COPD, 22.84% chronic bronchitis and 13.82% with asthma.

For the estimation of the effect of a specific health condition on a married man (or woman)'s earnings, hourly wages and hours of work I use the matched samples just described. I drop self-employed individuals[25] and I select married men (or married women) who participate in the labor market, have a positive number of hours worked per week and positive hourly wages.

[25] Implicit in this exclusion is the assumption that self-employed individuals would be just like a regular employee if I could observe their wages.

Table 6 – Descriptive Statistics of the Matched Samples

	Married Men Aged 18-64 with a Wife older than 18		Married Women Aged 18-64 with a Husband older than 18	
Variables	Mean	Std. Dev.	Mean	Std. Dev.
Dependent Variables				
Individual participating	0.881	0.324	0.746	0.435
Weekly Earnings	921.797	699.389	574.527	391.109
Hourly Wage	20.572	14.991	14.916	8.432
Weekly Hours of Work	44.119	10.123	37.503	10.972
Husband's Characteristics				
Age	47.312	10.494	46.798	11.389
Age 25-34	0.132	0.338	0.143	0.350
Age 35-44	0.234	0.423	0.278	0.448
Age 45-54	0.311	0.463	0.290	0.454
Age 55-64	0.311	0.463	0.222	0.416
Age 65+	-	-	0.054	0.226
Years of education	13.123	3.063	12.866	3.089
High-school degree	0.327	0.469	0.343	0.475
Some college	0.203	0.402	0.201	0.401
College	0.304	0.460	0.270	0.444
Non-white	0.099	0.299	0.109	0.311
Hispanic	0.112	0.316	0.141	0.348
Served in the military	0.287	0.452	0.265	0.441
Wife's Characteristics				
Age	44.749	10.486	44.372	10.462
Age 25-34	0.165	0.371	0.171	0.377
Age 35-44	0.272	0.445	0.298	0.457
Age 45-54	0.338	0.473	0.303	0.460
Age 55-64	0.187	0.390	0.203	0.402
Age 65+	0.011	0.103	-	-
Years of education	12.960	2.847	12.830	2.874
High-school degree	0.345	0.475	0.347	0.476
Some college	0.250	0.433	0.242	0.429
College	0.247	0.431	0.231	0.421
Non-white	0.101	0.301	0.105	0.306
Hispanic	0.131	0.337	0.138	0.345
Served in the military	0.011	0.106	0.009	0.096
Household's Characteristics				
Number of children age05	0.294	0.629	0.288	0.618
Number of children age611	0.334	0.667	0.362	0.693
Number of children age1217	0.322	0.647	0.366	0.680
Transfer income/1000	1.753	5.333	1.833	5.596
Non-transfer income/1000	1.543	5.045	1.498	5.253
Area Characteristics				
Non-MSA	0.250	0.433	0.253	0.435
Unemployment rate by county	4.892	2.406	4.986	2.478
Average weekly wage by county/100	5.988	1.545	5.968	1.532
Total Observations	13,347		18,615	

Notes: The matched samples are the result of the application of the data matching algorithm described in this section to the original sample. The original sample refers to the 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old. Table A1 in Appendix A presents the definition of the variables.

Table 7 – Married Men and Women by Health Condition and Age Group: Matched Sample of Married Men Aged 18-64 with a Wife older than 18

Part I - Husband's Health Conditions by Age Group

	Age 18-24		Age 25-34		Age 35-44		Age 45-54		Age 55-64		Age 65+		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Cancer	2	5.56	21	5.74	60	8.96	148	16.44	213	20.40	-	-	444	14.72
Severe Cancer	2	5.56	20	5.46	44	6.57	103	11.44	157	15.04	-	-	326	10.81
Stroke	0	0.00	1	0.27	6	0.90	24	2.67	57	5.46	-	-	88	2.92
Ischemic Heart Disease	0	0.00	6	1.64	28	4.18	78	8.67	113	10.82	-	-	225	7.46
Emphysema	0	0.00	1	0.27	4	0.60	13	1.44	40	3.83	-	-	58	1.92
Chronic Bronchitis	12	33.33	103	28.14	167	24.93	137	15.22	127	12.16	-	-	546	18.10
COPD	12	33.33	104	28.42	170	25.37	147	16.33	162	15.52	-	-	595	19.73
Asthma	7	19.44	58	15.85	90	13.43	105	11.67	62	5.94	-	-	322	10.68
Number of Husbands	36		366		670		900		1,044		-	-	3,016	

Part II - Wife's Health Conditions by Age Group

	Age 18-24		Age 25-34		Age 35-44		Age 45-54		Age 55-64		Age 65+		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Cancer	10	10.10	85	12.39	166	13.74	209	16.51	139	19.80	6	12.24	615	15.34
Severe Cancer	10	10.10	83	12.10	152	12.58	167	13.19	110	15.67	4	8.16	526	13.12
Stroke	0	0.00	1	0.15	7	0.58	22	1.74	21	2.99	3	6.12	54	1.35
Ischemic Heart Disease	0	0.00	3	0.44	11	0.91	34	2.69	35	4.99	9	18.37	92	2.29
Emphysema	0	0.00	0	0.00	4	0.33	9	0.71	14	1.99	3	6.12	30	0.75
Chronic Bronchitis	26	26.26	179	26.09	323	26.74	240	18.96	145	20.66	3	6.12	916	22.84
COPD	26	26.26	179	26.09	326	26.99	242	19.12	153	21.79	6	12.24	932	23.24
Asthma	15	15.15	104	15.16	163	13.49	181	14.30	85	12.11	6	12.24	554	13.82
Number of Wives	99		686		1,208		1,266		702		49		4,010	

Notes: The matched samples are the result of the application of the data matching algorithm described in this section to the original sample. The original sample refers to the 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old, and (v) married men older than 64. Part I of the table refers to the sample of ill married men matched with healthy married men by age, education, race and ethnicity. The second part of the table refers to the sample of married men with an ill wife matched with married men with a healthy wife by age, education, race and ethnicity. An individual is defined as ill if he/she has at least one of the following conditions: cancer, stroke, ischemic heart disease, asthma, chronic bronchitis or COPD. An individual is defined as healthy if he/she does not have any of these conditions. Table A1 in Appendix A presents a definition of each condition.

Table 8 – Married Men and Women by Health Condition and Age Group: Matched Sample of Married Women Aged 18-64 with a Husband older than 18

Part I - Husband's Health Conditions by Age Group

	Age 18-24		Age 25-34		Age 35-44		Age 45-54		Age 55-64		Age 65+		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Cancer	2	5.71	21	5.38	60	8.46	146	15.89	204	20.73	107	29.48	540	15.88
Severe Cancer	2	5.71	20	5.13	44	6.21	102	11.10	149	15.14	86	23.69	403	11.85
Stroke	0	0.00	1	0.26	6	0.85	24	2.61	49	4.98	28	7.71	108	3.18
Ischemic Heart Disease	0	0.00	6	1.54	28	3.95	78	8.49	109	11.08	46	12.67	267	7.85
Emphysema	0	0.00	1	0.26	4	0.56	12	1.31	38	3.86	31	8.54	86	2.53
Chronic Bronchitis	12	34.29	103	26.41	167	23.55	137	14.91	126	12.80	40	11.02	585	17.21
COPD	12	34.29	104	26.67	170	23.98	146	15.89	159	16.16	66	18.18	657	19.32
Asthma	7	20.00	58	14.87	90	12.69	104	11.32	60	6.10	18	4.96	337	9.91
Number of Husbands	35		390		709		919		984		363		3,400	

Part II - Wife's Health Conditions by Age Group

	Age 18-24		Age 25-34		Age 35-44		Age 45-54		Age 55-64		Age 65+		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Cancer	10	10.42	85	12.65	166	13.62	217	17.09	179	18.10	-	-	657	15.47
Severe Cancer	10	10.42	83	12.35	152	12.47	173	13.62	140	14.16	-	-	558	13.14
Stroke	0	0.00	1	0.15	7	0.57	24	1.89	30	3.03	-	-	62	1.46
Ischemic Heart Disease	0	0.00	3	0.45	11	0.90	35	2.76	46	4.65	-	-	95	2.24
Emphysema	0	0.00	0	0.00	4	0.33	9	0.71	19	1.92	-	-	32	0.75
Chronic Bronchitis	26	27.08	179	26.64	324	26.58	248	19.53	187	18.91	-	-	964	22.70
COPD	26	27.08	179	26.64	327	26.83	250	19.69	199	20.12	-	-	981	23.10
Asthma	15	15.63	104	15.48	163	13.37	187	14.72	120	12.13	-	-	589	13.87
Number of Wives	96		672		1,219		1,270		989		-		4,246	

Notes: The matched samples are the result of the application of the data matching algorithm described in Section 2.3.1 to the original sample. The original sample refers to the 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old, and (v) married women older than 64. Part I of the table refers to the sample of ill married women matched with healthy married women by age, education, race and ethnicity. The second part of the table refers to the sample of married women with an ill husband matched with married women with a healthy husband by age, education, race and ethnicity. An individual is defined as ill if he/she has at least one of the following conditions: cancer, stroke, ischemic heart disease, asthma, chronic bronchitis or COPD. An individual is defined as healthy if he/she does not have any of these conditions. Table A1 in Appendix A presents a definition of each condition.

Table 9 – Descriptive Statistics of the Matched Samples for Analyzing the Effect of a Spouse's Health Condition on the Labor Market Decisions of the Other Spouse

	Married Men 18-64 with a Wife older than 18		Married Women 18-64 with a Husband older than 18	
Variables	Mean	Std. Dev.	Mean	Std. Dev.
Dependent Variables				
Individual participating	0.916	0.277	0.731	0.443
Weekly Earnings	899.761	603.738	571.035	394.028
Hourly Wage	19.933	12.775	14.830	8.519
Weekly Hours of Work	44.530	10.055	37.497	11.073
Husband's Characteristics				
Age	45.688	10.318	48.909	11.811
Age 25-34	0.149	0.356	0.123	0.329
Age 35-44	0.287	0.452	0.228	0.419
Age 45-54	0.311	0.463	0.277	0.447
Age 55-64	0.240	0.427	0.280	0.449
Age 65+	-		0.082	0.274
Years of education	12.840	3.055	12.930	3.071
High-school degree	0.353	0.478	0.338	0.473
Some college	0.199	0.399	0.196	0.397
College	0.264	0.441	0.281	0.450
Non-white	0.104	0.305	0.105	0.306
Hispanic	0.143	0.350	0.118	0.323
Served in the military	0.012	0.110	0.309	0.462
Wife's Characteristics				
Age	43.622	10.312	45.959	10.684
Age 25-34	0.184	0.388	0.154	0.361
Age 35-44	0.310	0.462	0.244	0.430
Age 45-54	0.315	0.465	0.319	0.466
Age 55-64	0.155	0.362	0.262	0.440
Age 65+	0.009	0.097	-	-
Years of education	12.803	2.910	12.831	2.801
High-school degree	0.344	0.475	0.357	0.479
Some college	0.247	0.432	0.251	0.434
College	0.231	0.422	0.224	0.417
Non-white	0.109	0.312	0.102	0.303
Hispanic	0.147	0.354	0.119	0.324
Served in the military	0.255	0.436	0.010	0.100
Household's Characteristics				
Number of children age05	0.301	0.628	0.264	0.598
Number of children age611	0.371	0.699	0.313	0.642
Number of children age1217	0.389	0.708	0.320	0.646
Transfer income/1000	1.520	4.943	2.614	6.712
Non-transfer income/1000	1.449	5.243	1.676	5.592
Area Characteristics				
Non-MSA	0.244	0.430	0.262	0.440
Unemployment rate by county	4.956	2.422	4.958	2.561
Average weekly wage by county/100	5.970	1.543	5.911	1.534
Total Observations	17,718		14,825	

See Notes Table 6.

2.4 Overview of the Empirical Models and Estimation Methods

2.4.1 Labor Force Participation

The first goal of this research is to investigate how the health conditions of married people affect their labor force participation. I estimate a random effects probit where labor force participation (*P*) is the dependent variable. I define an individual as being in the labor force if he/she identifies himself as currently working, unemployed or looking for a job, or temporarily laid off or on leave. All other individuals are classified as not in the labor force.

I assume that participation is driven by the latent variable *P**:

$$(1) \qquad P_{it}^{*} = \alpha_0 + \mathbf{C_{j,it}}\boldsymbol{\alpha_1} + \mathbf{X_{m,it}}\boldsymbol{\alpha_2} + \mathbf{X_{f,it}}\boldsymbol{\alpha_3} + \mathbf{X_{h,it}}\boldsymbol{\alpha_4} + \mathbf{Z_{it}}\boldsymbol{\alpha_5} + \mathbf{T_{it}}\boldsymbol{\alpha_6} + \varepsilon_{1,it}$$

where *t* represents the interview round (*t = 1, … ,T,* with T = 5); *m* denotes the husband and *f* the wife. P_{it}^{*}, which is not observed, represents the propensity of individual *i* (*i = m* if husband and *f* if wife) to participate in the labor market in round *t*. The vector $\mathbf{C_{j,it}}$ includes dummy variables equal to 1 if individual *i* has condition *j* in round *t*; 0 otherwise. Specifications that also include continuous variables for the duration of individual *i*' s health condition *j*, plus companion dummy variables equal to 1 if the duration of condition *j* is missing, 0 otherwise, and quadratic variables of the duration of the health condition *j* are also implemented.[26] The vector $\mathbf{C_{j,it}}$ also includes dummy variables for the presence of mental illness, back problems and arthritis because a significant percentage of individuals have at least one of these

[26] Duration refers to the number of years that the individual has had condition *j*.

conditions, and because previous literature found these illnesses to be important.[27] $\mathbf{X_{m,it}}$ and $\mathbf{X_{f,it}}$ denote two vectors of husband and wife's demographics, respectively, such as age, age squared and education dummies, whether the individual served in the military, ethnicity and race. $\mathbf{X_h}$ represents the household characteristics, such as number of children in age group 0-5, 6-11 or 12-17; transfer income and non-transfer income in thousands of dollars.[28][29] **Z** is a vector of local labor markets variables, such as the unemployment rate in the county and the annual average weekly wage in the county in hundreds of dollars; it also includes information on the area of residence of the respondent (i.e., if the couple lives in a rural area or small town or in a statistical metropolitan area), **T** is a vector of dummies for the year and month of interview.

As mentioned, P_{it}^{*} is not observed. What I do observe is whether the individual participates in the labor force. The mapping from the latent propensity to participate in the labor force, P_{it}^{*}, to the observable P_{it} is

$$P_{it} = \begin{cases} 1 \; if \; P_{it}^{*} > 0 \\ 0 \; if \; P_{it}^{*} \le 0 \end{cases}.$$

where P_{it} is equal to 1 if individual *i* participates in the labor market in round *t* and 0 otherwise. On assuming that the error term, $\varepsilon_{1,it}$, is normally distributed, this results in a probit equation. I further assume that the error term is comprised of two components, both of which are normally distributed:

[27] I do not control for the duration of mental illness, back problems and arthritis because they are not of primary interest in this research and because there is no particular reason to believe that they should be related to exposure to common pollutants.
[28] Transfer income includes person's Social Security Income, alimony income, child support, public assistance, Supplemental Security Income (SSI), Individual Retirement Account (IRA) income, pension income, veteran's income, and other regular cash contributions.
[29] Non-transfer income includes person's interest income, dividend income, sales income, trust/rent income, and refund income.

$\varepsilon_{1,it} = \nu_1 + \eta_{1,it}$ and $\varepsilon_{1,it} \sim N(0, \mathbf{V})$.

The term ν_1 is an individual-specific error component that remains unchanged within an individual over time and is independent across individuals; $\eta_{1,it}$ is an i.i.d. error across and within individuals. This means that $\varepsilon_{1,it}$ is a T-variate normal vector with zero means and variance-covariance matrix **V**, where $\mathbf{V}= \begin{bmatrix} 1 & \cdots & \rho \\ \vdots & \ddots & \vdots \\ \rho & \cdots & 1 \end{bmatrix}$. The time-varying and time-invariant independent variables are assumed exogenous with respect to the error term. The resulting model is a random-effects probit. The contribution to the likelihood by each individual is the probability of observing the exact sequence of labor force participation decisions reported by the individual for each of the T survey rounds. This probability is an integral of order *T* of the joint normal density of the errors.[30]

2.4.2 Weekly Earnings Equation

The second goal of this research is to estimate the effect of a married person's health condition on their own weekly earnings. The equation for weekly earning is defined as follows

(2) $$\ln earn^{*}_{it} = \beta_0 + \mathbf{C_{j,it}}\boldsymbol{\beta}_1 + \mathbf{X_{it}}\boldsymbol{\beta}_2 + \mathbf{X_{h,it}}\boldsymbol{\beta_3} + \beta_4 annww_{it} + \mathbf{T_t}\boldsymbol{\beta_5} + \varepsilon_{2,it}.$$

[30] The individual's *i* contribution to the likelihood is

$$l_i = \Pr(P_{m1} = p_{m1}, P_{m2} = p_{m2}, ..., P_{mT} = p_{mT}) = \int_{-\infty}^{\mathbf{X}_1\boldsymbol{\beta}} \int_{-\infty}^{\mathbf{X}_2\boldsymbol{\beta}} ... \int_{-\infty}^{\mathbf{X}_T\boldsymbol{\beta}} \phi(\varepsilon_1, \varepsilon_2, ..., \varepsilon_T) d\varepsilon_T ... d\varepsilon_2 d\varepsilon_1$$

where **X** denotes all the vectors of independent variables included in the participation equation (10) at time 1, 2, … , T.

Because earnings are observed only if the individual works, I specify the following mapping to the observables:

$\ln earn_{it} = \ln earn_{it}^{*}$ *if* $P_{it} = 1$, that is $P_{it}^{*} > 0$.

The dependent variable in equation (2) is the logarithm of the individual *i*'s weekly earnings at round *t*. I construct weekly earnings as the product of the weekly number of hours worked and the hourly wage. Among the independent variables I include the annual average weekly wages by county ($annww_t$), and the vectors $\mathbf{C_{j,it}}$, $\mathbf{X_{it}}$, $\mathbf{X_{h,it}}$, $\mathbf{T_t}$, which are the same vectors that appear in labor force participation equation (1). Experience is approximated by age and education and I do not control for occupation or industry, as these variables are endogenous.

In order to estimate consistent estimates, I account for sample selection by using Heckman's two-step estimation procedure following Wooldridge (1995, 2002 p. 583). For each period *t*, I estimate a cross-sectional probit model of labor force participation with the same explanatory variables of the model described in the previous section, and dependent variable $P_{i,t}$, which is equal to 1 if individual *i* participates in the labor market in round *t* and 0 otherwise. Then, I compute the value of the inverse Mills ratio $\hat{\lambda}_{it} = \dfrac{\varphi\left(\mathbf{R_i}\widehat{\boldsymbol{\alpha}_i}\right)}{\Phi\left(\mathbf{R_i}\widehat{\boldsymbol{\alpha}_i}\right)}$, all *i* and *t*, where $\mathbf{R_i}$ summarizes all the independent variables of equation (1) and $\widehat{\boldsymbol{\alpha}_i}$ is the vector of probit coefficients.

Finally, I estimate the following equation by running a pooled OLS regression:

(3) $\ln earn_{it} = b_0 + b_1\hat{\lambda}_{i1} + \ldots + b_T\hat{\lambda}_{iT} + \mathbf{C_{j,it}b_{T+1}} + \mathbf{X_{it}b_{T+2}} + \mathbf{X_{h,it}b_{T+3}} + b_{T+4}annww_{it} + \mathbf{T_i b_{T+5}} + e_{1,it}$

where $\hat{\lambda}_{i1}$ represents the inverse Mills ratio computed at period 1, and $\hat{\lambda}_{iT}$ at period T.

Entering the estimated inverse Mills ratio in the right-hand side of equation (3), however, introduces heteroskedasticity. Because, in addition, the error terms are correlated, I use White's heteroskedastic-consistent covariance matrix modified to obtain a cluster-correlated robust variance-covariance matrix of the coefficients. Wooldridge (2002) warns that although in principle the first-step probit and the second-step linear regression can contain exactly the same regressors, to ensure identification it is best to include some regressors in the first-step probit that are not part of the vector of regressors in the second-step equation (3). I follow his advice by excluding from earnings equation (3) the metropolitan statistical area dummy, the county's unemployment rate, if the spouses have served in the military, and the demographic characteristics of the spouse of individual *i*.

2.4.3 Hourly Wages Equation

The third goal of this study is to estimate the effect of a married person's health condition on their own hourly wages. Because of the health condition the individual may choose a less demanding job that offers lower wages. The structural equation for hourly wages is

(4) $$w_{it}^{*} = \gamma_0 + \gamma_1 l_{it} + \mathbf{C_{j,it}\gamma_2} + \mathbf{X_{it}\gamma_3} + \gamma_4 annww_{it} + \mathbf{T_t\gamma}_5 + \varepsilon_{3,it}.$$

Because wages w_{it} are observed only when one works,

$w_{it} = w_{it}^{*}$ *if* $P_{it} = 1$, that is $P_{it}^{*} > 0$.

The dependent variable is the logarithm of individual *i*'s hourly wages at round *t*. The variable l_{it} represents the number of hours worked by individual *i* per

week, which I regard as endogenous. As before, I must first estimate the participation equation, which allows me to create the inverse Mills ratios that controls for sample selection. I must also account for the endogeneity of the hours worked. To do so, I apply two-stage least squares (2SLS). I estimate an equation explaining the number of hours worked by individual *i* ($\hat{l}_{it}$) as a function of instruments:

(5) $$l_{it} = \theta_0 + \theta_1\hat{\lambda}_{i1} + ... + \theta_T\hat{\lambda}_{iT} + \mathbf{C_{j,it}\theta_{T+1}} + \mathbf{X_{it}\theta_{T+2}} + \mathbf{X_{h,it}\theta_{T+3}} + \theta_{T+4}annww_{it} + \mathbf{T_t\theta_{T+5}} + \zeta_{1,it}$$

Then, in the second stage, I include the predicted number of hours of work ($\hat{l}_{i,t}$) and the inverse Mills ratios for sample selection in wage equation (4). I finally run OLS on the equation

(6) $$w_{it} = c_0 + c_1\hat{\lambda}_{i1} + ... + c_T\hat{\lambda}_{iT} + c_{T+1}\hat{l}_{it} + \mathbf{C_{j,it}c_{T+2}} + \mathbf{X_{it}c_{T+3}} + c_{T+4}annww_{it} + \mathbf{T_tc_{T+5}} + e_{2,it}.$$

I use White's heteroskedastic-consistent covariance matrix modified to obtain cluster-correlated robust estimate of variance. To ensure identification, I exclude from wage equation (6) the metropolitan statistical area dummy, the county's unemployment rate, whether the spouses have served in the military, household variables $\mathbf{X_h}$, and the spouse's demographic characteristics. Experience is approximated by age and education and I do not control for occupation or industry, as these variables are endogenous.

2.4.4 Labor Supply Equation

The forth goal of this research is to estimate the effect of a married person's health condition on their own weekly hours of work. Hours of work are observed only if individual *i* participates in the labor force and is employed. They are function of the hourly wage (w_{it}), of the own health condition *j* ($\mathbf{C_{j,it}}$), of the demographic and

household characteristics ($\mathbf{X_i}$, $\mathbf{X_h}$). All variables are defined as in the previous sections with the exception of $\mathbf{X_i}$, which in this case does not include the education of individual *i*.

The structural equation for weekly hours of work is

(7) $$l_{it}^{*} = \delta_0 + \delta_1 w_{it} + \mathbf{C_{j,it}}\boldsymbol{\delta}_2 + \mathbf{X_{it}}\boldsymbol{\delta}_3 + \mathbf{X_{h,it}}\boldsymbol{\delta}_4 + \mathbf{T_t}\boldsymbol{\delta}_5 + \varepsilon_{4,it}$$

with $l_{it} = l_{it}^{*}\ if\ P_{it} = 1$, that is $P_{it}^{*} > 0$, i.e., I observe work hours only if individual *i* participates in the labor market and is employed. The dependent variable is individual *i*'s weekly hours of work at round *t*. Once again, I assume that the error term contains individual-specific effects that are uncorrelated with the independent variables. As before, following Wooldridge (1995, 2002 p. 583), Heckman's two-step estimation procedure is deployed to account for sample selection, and 2SLS to deal with the endogeneity of wages.

The first stage of the 2SLS procedure regresses log husband wages on a set of instruments and sample selection correction terms for all *i* and *t*:

(8) $$w_{it} = \mu_0 + \mu_1 \hat{\lambda}_{i1} + ... + \mu_T \hat{\lambda}_{iT} + \mathbf{C_{j,t}}\boldsymbol{\mu}_{\mathbf{T+1}} + \mathbf{X_{it}}\boldsymbol{\mu}_{\mathbf{T+2}} + \mathbf{X_{h,it}}\boldsymbol{\mu}_{\mathbf{T+3}} + \mu_{T+4} annww_{it} + \mathbf{T_t}\boldsymbol{\mu}_{\mathbf{T+5}} + \zeta_{2,it}.$$

The estimated coefficients can be used to form a prediction, $\hat{w}_{it}$. In the second stage I estimate the following hours worked equation, which accounts for sample selection through the inverse Mill ratios:

(9) $$l_{it} = d_0 + d_1 \hat{\lambda}_{i1} + ... + d_T \hat{\lambda}_{iT} + d_{T+1}\hat{w}_{it} + \mathbf{C_{j,it}}\mathbf{d}_{\mathbf{T+2}} + \mathbf{X_{it}}\mathbf{d}_{\mathbf{T+3}} + \mathbf{X_{h,it}}\mathbf{d}_{\mathbf{T+4}} + \mathbf{T_t}\mathbf{d}_{\mathbf{T+5}} + e_{3,it}$$

As before, I use White's heteroskedastic-consistent covariance matrix modified to obtain cluster-correlated robust estimate of variance. For identification, I exclude from the hours of work equation, equation (9), the metropolitan statistical area

dummy, the unemployment rate, if the spouses have served in the military, the education level of individual *i*, and the spouse's demographic characteristics.

In order to estimate the effect of a spouse health's condition on the labor force participation, earnings, wages and hours of work of the other spouse, I use the same equations just specified where, however, $\mathbf{C_{j,t}}$ is a vector of variables referring to the health condition of the spouse of individual *i*.

2.5 Results[31]

2.5.1 Effect of a Married Man and Married Woman's Health Condition on their Labor Market Decisions and Productivity

Labor Force Participation

Tables 10 and 11 present the results of the random-effects probit of a married man and a married woman's labor force participation for the health conditions examined and their duration.[32] I analyze three models. Model 1 includes dummy variables denoting the presence or absence of each of the health conditions examined in this dissertation. Model 2 includes all of the abovementioned dummy variables, plus the health condition's duration, which is the number of years each conditions was experienced for. Model 3 includes the health condition's duration and duration

[31] In this section I present the results using the matched samples described in Section 3.1. However, Tables A12 and A13 in Appendix A present also the coefficients estimated using the original 1996-2002 MEPS data without implementing the matching procedure described in Section 3.1.

[32] The coefficients of the other control variables are presented in Tables A3, A4, A16 and A17 in Appendix A. Among the control variables, I include arthritis, mental illness and back problems. It is interesting to note that their coefficients are robust and significant across regressions: arthritis, mental illness and back problems decrease the likelihood that the husband participates in the labor force at the 1% statistical level. The largest effect is associated with having mental illness.

squared. Marginal effects were calculated for a married man or woman 47 years old, white, non-Hispanic, and with a high school degree.

Model 1 of Table 10 shows that all the examined health conditions, (cancer, stroke, ischemic heart disease, emphysema, and asthma) reduce a married man's participation in the labor force, with the exception of chronic bronchitis and COPD. As expected, the most severe cancer category (i.e., the category that among the skin cancers considers only melanomas) has a greater negative effect than the cancer category that includes the non-melanoma types of skin-cancers - the effect is a 15 percentage points reduction versus 4.6. Stroke and emphysema have the largest negative effects. Having had a stroke reduces the probability of participating in the labor force by an average of 29 percentage points, while emphysema by an average of 23 percentage points. Smaller effects are associated with asthma (-6.9%) and ischemic heart disease (-9.8%).

Model 2 of Table 10 suggests that the longer a married man has had the health condition the stronger is the negative effect on his labor force participation. However, Model 3 indicates that the relationship between the duration of a health condition and the probability of being in the labor force is U-shaped.

Table 10 –Effects of a Married Man's Health Condition on his Labor Force Participation

Husband's Health Condition	Model 1		Model 2		Model 3	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Cancer	-0.7947***	-0.0457	-0.3162***	-0.0421	-0.6641	-0.0326
	(0.2527)		(0.0812)		(0.4240)	
Duration			-0.0115	-0.0106	-0.3679***	-0.0183
			(0.0092)		(0.0987)	
Severe Cancer	-0.8791***	-0.1520	-1.0172**	-0.0665	-0.6132***	-0.1038
	(0.1488)		(0.4586)		(0.2332)	
Duration			-0.3224***	-0.0196	-0.1662	-0.0263
			(0.0764)		(0.1125)	
Stroke	-4.2336***	-0.2888	-1.0010***	-0.2179	-3.2431**	-0.1910
	(0.6883)		(0.1724)		(1.2993)	
Duration			-0.0924***	-0.0577	-1.4877***	-0.0819
			(0.0289)		(0.3471)	
Ischemic Heart Disease	-1.6172***	-0.0981	-0.4329***	-0.0593	-1.3956	-0.0726
	(0.4069)		(0.1635)		(1.3752)	
Duration			-0.0569***	-0.0239	-0.3817**	-0.0241
			(0.0118)		(0.1855)	

Notes: Each model has been estimated by random effects probit. Marginal effects for the health condition are for discrete change of the dummy variable from 0 to 1, and they have been calculated for the average husband in the sample (i.e., 47 years old, white, non-Hispanic, and with a high school degree). Each model includes all the health conditions at the same time with the exception of COPD. Separate equations that include COPD and the other health conditions with the exception of emphysema and chronic bronchitis have been also estimated. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include husband's and wife's characteristics, household and area characteristics, dummy variables for the year and month of interview, dummy variables for husband's arthritis, back problems and mental illness as listed in Table A3 in Appendix A. The sample is the matched sample of married men aged 18-64 with wives older than 18 described in Section 2.3.1, Table 6. Robust standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table 10 – (Continued)

Husband's Health Condition	Model 1		Model 2		Model 3	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Emphysema	-3.4529***	-0.2295	-0.2297	-0.1092	-1.6568	-0.0880
	(1.0994)		(0.6747)		(2.2814)	
Duration			-0.0415***	-0.0151	-0.3571	-0.0213
			(0.0146)		(0.3257)	
Chronic Bronchitis	0.1675	0.0089	0.0696	0.0148	0.2603	0.0118
	(0.2451)		(0.0643)		(0.2769)	
Duration			-0.0430***	-0.0053	0.0460	0.0005
			(0.0103)		(0.2211)	
COPD	-0.0726	-0.0018	0.0650	0.0044	0.1957	0.0088
	(0.1974)		(0.0649)		(0.2689)	
Duration			-0.0375	-0.0031	-0.4088***	-0.0200
			(0.0081)		(0.1491)	
Asthma	-1.1672***	-0.0688	-0.3472***	-0.1171	-1.5388*	-0.0830
	(0.4360)		(0.1065)		(0.8791)	
Duration			0.0142***	0.0040	0.0824	0.0029
			(0.0044)		(0.0851)	

Notes: Each model has been estimated by random effects probit. Marginal effects for the health condition are for discrete change of the dummy variable from 0 to 1, and they have been calculated for the average husband in the sample (i.e., 47 years old, white, non-Hispanic, and with a high school degree). Each model includes all the health conditions at the same time with the exception of COPD. Separate equations that include COPD and the other health conditions with the exception of emphysema and chronic bronchitis have been also estimated. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include husband's and wife's characteristics, household and area characteristics, dummy variables for the year and month of interview, dummy variables for husband's arthritis, back problems and mental illness as listed in Table A3 in Appendix A. The sample is the matched sample of married men aged 18-64 with wives older than 18 described in Section 2.3.1, Table 6. Robust standard errors clustered on husbands are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table 11 – Effects of a Married Woman's Health Condition on her Labor Force Participation

Wife's Health Condition	Model 1		Model 2		Model 3	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Cancer	-0.1456	-0.0024	-0.1797	-0.0027	-0.2076	-0.0046
	(0.1321)		(0.1747)		(0.1468)	
Duration			-0.0108	-0.0002	-0.0931	-0.0013
			(0.0548)		(0.0857)	
Severe Cancer	-0.1932*	-0.0156	-0.1634	-0.0067	-0.2231*	-0.0198
	(0.1004)		(0.1624)		(0.1327)	
Duration			0.0416	0.0017	0.0844	0.0053
			(0.0431)		(0.0918)	
Stroke	-2.1340**	-0.0510	-2.3169	-0.0528	-1.9639**	-0.0599
	(0.9136)		(2.2121)		(0.8708)	
Duration			-0.3753*	-0.0130	-0.6644*	-0.0350
			(0.1998)		(0.4029)	
Ischemic Heart Disease	-2.3446***	-0.0583	-2.1782***	-0.0483	-1.7574***	-0.0518
	(0.5143)		(0.7433)		(0.6727)	
Duration			-0.2226*	-0.0072	-0.0785	-0.0069
			(0.1301)		(0.3648)	

Notes: Each model has been estimated by random effects probit. Marginal effects for the health condition are for discrete change of the dummy variable from 0 to 1. They have been calculated for the average wife in the sample (i.e., 47 years old, white, non-Hispanic, and with a high school degree). Each model includes all the health conditions at the same time with the exception of COPD. Separate equations that include COPD and the other health conditions with the exception of emphysema and chronic bronchitis have been also estimated. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include husband's and wife's characteristics, household and area characteristics, dummy variables for the year and month of interview, dummy variables for husband's arthritis, back problems and mental illness as listed in Table A4 in Appendix A. The sample is the matched sample of married women aged 18-64 with husbands older than 18 described in Section 2.3.1, Table 6. Robust standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table 11 – (Continued)

Wife's Health Condition	Model 1		Model 2		Model 3	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Emphysema	-1.6035**	-0.0347	17.1759	0.0294	11.4713	0.0459
	(0.7947)		(259.4793)		(685.4792)	
Duration			0.1384	0.0000	0.7588	0.000004
			(0.2526)		(0.4614)	
Chronic Bronchitis	0.1902*	0.0029	0.2191*	0.0030	0.2173**	0.0045
	(0.1083)		(0.1170)		(0.1002)	
Duration			-0.0136	-0.0002	0.0297	0.0003
			(0.0478)		(0.0635)	
COPD	0.1566*	0.0032	0.2049*	0.0030	0.2085**	0.0043
	(0.0921)		(0.1163)		(0.1003)	
Duration			-0.0136	-0.0002	0.0172	0.0001
			(0.0442)		(0.0566)	
Asthma	-0.3048**	-0.0051	-0.2035	-0.0031	-0.1840	-0.0041
	(0.1526)		(0.2632)		(0.2120)	
Duration			0.0044	0.0008	0.0325	0.0003
			(0.0119)		(0.0282)	

Notes: Each model has been estimated by random effects probit. Marginal effects for the health condition are for discrete change of the dummy variable from 0 to 1. They have been calculated for the average wife in the sample (i.e., 47 years old, white, non-Hispanic, and with a high school degree). Each model includes all the health conditions at the same time with the exception of COPD. Separate equations that include COPD and the other health conditions with the exception of emphysema and chronic bronchitis have been also estimated. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include husband's and wife's characteristics, household and area characteristics, dummy variables for the year and month of interview, dummy variables for husband's arthritis, back problems and mental illness as listed in Table A4 in Appendix A. The sample is the matched sample of married women aged 18-64 with husbands older than 18 described in Section 2.3.1, Table 6. Robust standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

For example, I find that married men who have had non-severe cancer for less than one year are just about as likely to work as married men without cancer. All else the same, minimum participation occurs at 18 years with the disease. This might be due to the fact that for the people that survived the illness could have become chronic and they adjusted to it.

In contrast with the results for married men, all the health conditions examined significantly affect the probability of a married woman to be part of the labor force, but the effect is comparatively small (Table 11). If a married woman has had a severe cancer then the likelihood that she is in the labor force is reduced by 1.6 percentage points, while if she had ischemic heart disease, a stroke or emphysema the percentage reductions are 5.8, 5.1 and 3.5, respectively. In addition, in contrast with the results for married men, the duration of the health condition does not affect her labor force participation (Table 11, Models 2 and 3).

The negative effects tied to labor force participation of stroke, ischemic heart disease, and emphysema are consistent with the results of previous literature, with the exception of Bartel and Taubman (1979). Bartel and Taubman (1979) do not find any significant effects of these conditions on labor force participation of veteran white men, whereas Cropper and Krupnick (1989) find that emphysema, heart attack, stroke and other chronic heart disease significantly decrease the probability of participating in the labor force of men. Wilson (2001) finds that heart disease negatively impacts the labor force participation of men in New Jersey and cancer does that of women. Emphysema and asthma do not affect men's and women's labor force participation. Finally, Narayan et al. (2005) finds that heart and lung diseases reduce the probability

of being in the labor force but fail to distinguish among conditions and between men and women.

In contrast with earlier studies I find a negative effect of asthma on married men's labor force participation. This could be a consequence of the fact that I am also the first to have a relative large percentage of asthmatics in the sample (322 men and 589 women, i.e., about 11% and 24% of the total samples used in the estimation, respectively). In addition, while Wilson (2001) and Narayan et al. (2005) find that cancer does not affect labor force participation, in my case cancer significantly and negatively affects husbands and wives' labor force participation. I conjecture that their results may have been driven by the small sample size of people with cancer in their sample, or by the fact that Narayan et al. (2001) do not distinguish between men and women.[33,34]

[33] In Wilson (2001) 2.1% of the men have cancer; in Narayan et al., 2001 is not clear what the total percentage is, but it ranges between 2% and 6%. For comparison, in my sample 15% of the males and 16% of the female have cancer.

[34] Generally, demographic and household's characteristics affect married men and women's labor force participation in the expected directions. For example, the more highly educated the husband is, the more likely he is to participate in the labor force (at 1% significant level); if he has children in the age group 0-5, he is less likely to work (at 10% significant level), while if he has children in the age group 6-11 or 12-17 he is more likely to participate than a husband without children, all else the same. Having served in the military does not have any effect on his labor force participation. Unlike the existing studies on the effect of own health on individual's labor market decisions, I also control for the spouse's characteristics, such as age, education, race and ethnicity. Or example, I find that the wife's age and ethnicity do not affect the husband's labor force participation while her education and race significantly affect the decision to work or not to work, all else the same. In particular, the more highly educated the wife is, the more likely her husband is to participate (at 1% significant level), while if the wife is non-white then the husband is less likely to participate in the labor market (at 10% significant level) than if she is white, all else the same.

Labor Productivity

Do health conditions linked with environmental exposures affect the productivity of married men and women? If so, how large is this effect? I answer these questions by estimating weekly earnings equation (3) as described in Section 2.4.2.[35]

Tables 12 and 13 present the marginal effects of each health condition and of the health condition's duration on a married man's and married woman's earnings. I analyze three models. Model 1 includes dummy variables denoting the presence or absence of each of the health conditions examined in this dissertation. Model 2 includes all of the abovementioned dummy variables, plus the health condition's duration, which is the number of years each conditions was experienced for. Model 3 includes the health condition's duration and duration squared. Marginal effects were calculated for a married man or woman 47 years old, white, non-Hispanic, and with a high school degree.

Model 1 of Table 12 indicates that if I do not control for the duration of the health conditions, none of the examined conditions affect married men's earnings. In contrast, if I control for how long a married man has had the health condition (Model 3), I find a 21.8% reduction in earnings if a married man has had ischemic heart disease for less than one year, and a 51.2% reduction in earnings if he has had emphysema for less than one year. To illustrate, having had emphysema for less than one year is enough to bring the earnings of a man with college degree down to those of a healthy man without high school diploma.

[35] The coefficients of the non-health variables are in Tables A5, A6, A7, A8 in Appendix A.

In addition, I find that while in the short term (i.e., less than one year) chronic bronchitis and COPD do not affect a married man's earnings, after one year of illness his earnings decrease. This means, for example, that experiencing chronic bronchitis for two years (i.e., the median duration) reduces earnings by 14.51% and experiences COPD for two years reduces earnings by 9.82%. Model 3 implies that earnings decline with the duration of the diseases until they reach a minimum after about 20 years with the illness; they increase with duration for more than 20 years with the disease.[36] For comparison, Cropper and Krupnick (1989) find that only emphysema and heart attack significantly reduce men's earnings.

If instead I consider married women, as Model 1 of Table 13 shows, I find that all the health conditions examined do not affect their earnings with the exception of stroke, which is slightly significant at the 10% level. A married woman that had a stroke experiences a 28.7% reduction in her earnings.

In order to analyze the effect of the health conditions examined on married men and women's productivity, I also consider the effect on hourly wages and I estimate equation (6) in Section 2.4.3. Marginal effects were calculated for a married man or woman 47 years old, white, non-Hispanic, and with a high school degree.

[36] Among the other regressors, only mental illness has a negative and significant effect on earnings (about 3%), while back problems and arthritis do not seem to affect earnings. In addition, non-whites and Hispanic men tend to earn less (-16% if non-white; -20% if Hispanic). As expected, the more highly educated a married man is, the higher his earnings (22% higher if he has a high school degree; 84% higher if he has a college degree).

Table 12 – Marginal Effects of a Married Man's Health Condition on his Labor Market Decisions

Husband's Health Condition	*Dependent Variables (Y)*								
	Husband's Log Weekly Earnings[a]			**Husband's Weekly Hours of Work[b]**			**Husband's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cancer	-0.0541	-0.0465	-0.0454	-0.2413	0.1487	0.1700	-0.0383	-0.0634	-0.0644
	(0.0380)	(0.0560)	(0.0560)	(0.6490)	(0.9637)	(0.9628)	(0.0325)	(0.0483)	(0.0484)
Duration		0.0106	0.0021		0.0136	0.0716		0.0073	-0.0058
		(0.0087)	(0.0164)		(0.1399)	(0.2591)		(0.0083)	(0.0150)
Severe Cancer	-0.0110	0.0247	0.0252	0.2503	0.3716	0.3890	-0.0491	-0.0201	-0.0213
	(0.0456)	(0.0588)	(0.0587)	(0.7808)	(1.0171)	(1.0170)	(0.0412)	(0.0554)	(0.0556)
Duration		0.0093	0.0077		0.3013	0.2039		-0.0148	-0.0110
		(0.0176)	(0.0282)		(0.3258)	(0.4743)		(0.0177)	(0.0220)
Stroke	-0.0914	-0.0226	-0.0204	-1.4481	-2.4062	-2.2729	-0.0300	0.1217	0.1067
	(0.1359)	(0.1671)	(0.1680)	(1.7155)	(2.2471)	(2.2820)	(0.1329)	(0.1648)	(0.1644)
Duration		0.0132	-0.0575		-0.8679***	-1.0286		0.0823***	-0.0125
		(0.0203)	(0.0698)		(0.2020)	(1.3439)		(0.0257)	(0.0636)
Ischemic Heart Disease	-0.0260	-0.2209*	-0.2460**	-0.6318	-1.2283	-0.9530	0.0028	-0.1116	-0.1637
	(0.0583)	(0.1236)	(0.1254)	(0.8784)	(1.2075)	(1.1980)	(0.0465)	(0.1150)	(0.1145)
Duration		-0.0230	0.0098		-0.4094*	-0.3673		0.0171	0.0271
		(0.0157)	(0.0232)		(0.2300)	(0.3476)		(0.0139)	(0.0189)
Emphysema	0.0184	-0.6661***	-0.6685***	2.0363	-4.6351**	-4.6529**	-0.2051*	-0.1688	-0.1771
	(0.0967)	(0.2363)	(0.2370)	(2.6094)	(2.3020)	(2.3234)	(0.1054)	(0.2112)	(0.2134)
Duration		-0.0123	-0.0264		0.6644**	0.5618		-0.0748***	-0.0865***
		(0.0132)	(0.0303)		(0.2602)	(0.8370)		(0.0150)	(0.0253)

Table 12 – (Continued)

Husband's Health Condition	*Dependent Variables*								
	Husband's Log Weekly Earnings[a]			**Husband's Weekly Hours of Work[b]**			**Husband's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Chronic Bronchitis	-0.0055	0.0101	0.0092	0.0171	-0.2463	-0.2370	-0.0159	0.0215	0.0195
	(0.0296)	(0.0309)	(0.0309)	(0.5323)	(0.5250)	(0.5256)	(0.0247)	(0.0261)	(0.0262)
Duration		-0.0108	-0.0696***		-0.2165*	-0.7727**		0.0088	0.0085
		(0.0116)	(0.0181)		(0.1256)	(0.3077)		(0.0103)	(0.0222)
COPD	0.0020	0.0087	0.0083	0.1972	-0.2508	-0.2340	-0.0285	0.0183	0.0157
	(0.0284)	(0.0309)	(0.0310)	(0.5327)	(0.5246)	(0.5252)	(0.0243)	(0.0261)	(0.0261)
Duration		-0.0095	-0.0466***		-0.0379	-0.0808		-0.0074	-0.0401
		(0.0094)	(0.0166)		(0.1397)	(0.4039)		(0.0092)	(0.0111)
Asthma	-0.0453	-0.0336	-0.0302	0.0460	1.1384	1.1573	-0.0414	-0.1412***	-0.1387***
	(0.0380)	(0.0642)	(0.0645)	(0.7485)	(1.3682)	(1.3653)	(0.0318)	(0.0521)	(0.0530)
Duration		0.0012	-0.0006		0.0014	0.0393		0.0010	-0.0025
		(0.0024)	(0.0032)		(0.0475)	(0.0597)		(0.0019)	(0.0027)

Notes: The estimated coefficients are presented in Table A16 in Appendix A. Each model includes all the health conditions at the same time with the exception of COPD. Separate equations have been estimated for COPD, which include all the health conditions at the same time with the exception of emphysema and chronic bronchitis. "Duration" refers to the number of years that the individual has had a health condition. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition linearly; and Model 3 also includes a quadratic term of the duration of the health condition. Each model accounts for sample selection by including inverse Mills ratio for each round of interview *t*. Each model also includes dummy variables for the year and month of interview and dummy variables for husband's arthritis, back problems and mental illness. The sample is the matched sample of married men aged 18-64 with wives older than 18 described in Section 2.3.1, Table 6. Robust standard errors clustered on husbands are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Other covariates include husband's and household characteristics; average weekly wages by county as listed in Table A5 in Appendix A.
[b] Other covariates include husband's and household characteristics and husband's predicted hourly wages as listed in Table A7 in Appendix A.
[c] Other covariates include husband's characteristics, average weekly wages by county and husband's predicted number of hours of work as listed in Table A9.

Table 13 – Marginal Effects of a Married Woman's Health Condition on her Labor Market Decisions

Wife's Health Condition	*Dependent Variables*								
	Wife's Log Weekly Earnings[a]			**Wife's Weekly Hours of Work[b]**			**Wife's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cancer	0.0026	0.0241	0.0272	-0.5402	-0.2999	-0.2877	0.0290	0.0222	0.0244
	(0.0403)	(0.0466)	(0.0465)	(0.6173)	(0.7574)	(0.7563)	(0.0265)	(0.0350)	(0.0351)
Duration		-0.0067	0.0156		-0.1537	-0.1748		0.0004	0.0153
		(0.0125)	(0.0238)		(0.2114)	(0.3587)		(0.0079)	(0.0141)
Severe Cancer	0.0308	0.0257	0.0270	-0.1745	0.0355	0.0173	0.0354	0.0149	0.0175
	(0.0393)	(0.0478)	(0.0476)	(0.6527)	(0.7952)	(0.7935)	(0.0266)	(0.0357)	(0.0356)
Duration		-0.0030	0.0002		-0.1219	-0.4932		0.0036	0.0240
		(0.0120)	(0.0247)		(0.2225)	(0.3818)		(0.0088)	(0.0159)
Stroke	-0.3383*	-0.6823	-0.6747	-0.1896	-9.2690*	-9.1870*	-0.2560**	0.0263	0.0278
	(0.1941)	(0.4546)	(0.4549)	(2.6017)	(4.8819)	(4.8966)	(0.1305)	(0.1909)	(0.1914)
Duration		-0.0078	0.1097		0.0954	0.5975		0.0001	0.1053
		(0.0950)	(0.1356)		(1.4374)	(2.5870)		(0.0566)	(0.0705)
Ischemic Heart Disease	-0.1026	0.0162	0.0159	-1.6329	-3.5429	-3.5429	-0.0550	0.1099**	0.1087**
	(0.0942)	(0.1045)	(0.1042)	(1.9406)	(2.8815)	(2.8815)	(0.0537)	(0.0524)	(0.0529)
Duration		0.0402**	-0.0173		0.6543	0.9171		-0.0144	-0.0624
		(0.0159)	(0.0661)		(1.6476)	(1.1560)		(0.0143)	(0.0385)
Emphysema	-0.0326	-0.2062	-0.2184	1.9439	9.4654***	9.3434***	-0.0587	-0.5609***	-0.5637***
	(0.1717)	(0.2023)	(0.1975)	(4.9032)	(3.0434)	(3.0384)	(0.1064)	(0.1917)	(0.1889)
Duration		-0.0372	-0.0116		-0.4813	-1.3254		-0.0291*	0.0329
		(0.0247)	(0.0902)		(0.8521)	(3.0266)		(0.0161)	(0.0364)

Table 13 – (Continued)

Wife's Health Condition	*Dependent Variables*								
	Wife's Log Weekly Earnings[a]			**Wife's Weekly Hours of Work[b]**			**Wife's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Chronic Bronchitis	0.0331	0.0460	0.0478	0.5854	1.0034*	0.9457*	0.0149	0.0092	0.0101
	(0.0305)	(0.0330)	(0.0328)	(0.5018)	(0.5179)	(0.5200)	(0.0219)	(0.0243)	(0.0242)
Duration		0.0052	0.0036		0.0258	0.0209		0.0013	0.0005
		(0.0050)	(0.0156)		(0.1161)	(0.3217)		(0.0050)	(0.0115)
COPD	0.0342	0.0471	0.0491	0.4066	0.9138*	1.0324**	0.0097	0.0062	0.0073
	(0.0304)	(0.0329)	(0.0327)	(0.4928)	(0.5216)	(0.5166)	(0.0219)	(0.0244)	(0.0243)
Duration		0.0036	-0.0034		0.0635	0.0082		0.0010	-0.0062
		(0.0050)	(0.0152)		(0.1148)	(0.2939)		(0.0050)	(0.0111)
Asthma	-0.0172	0.0659	0.0679	0.2707	0.2677	0.2630	-0.0320	0.0155	0.0171
	(0.0388)	(0.0573)	(0.0573)	(0.6218)	(1.0726)	(1.0741)	(0.0248)	(0.0395)	(0.0396)
Duration		-0.0038	0.0025		-0.0358	0.0440		-0.0015	0.0013
		(0.0033)	(0.0042)		(0.0456)	(0.0700)		(0.0022)	(0.0026)

Notes: The estimated coefficients are presented in Table A17 in Appendix A. Each model includes all the health conditions at the same time with the exception of COPD. Separate equations have been estimated for COPD, which include all the health conditions at the same time with the exception of emphysema and chronic bronchitis. "Duration" refers to the number of years that the individual has had a health condition. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition linearly; and Model 3 also includes a quadratic term of the duration of the health condition. Each model accounts for sample selection by including inverse Mills ratio for each round of interview *t*. Each model also includes dummy variables for the year and month of interview and dummy variables for wife's arthritis, back problems and mental illness. The sample is the matched sample of married women aged 18-64 with husbands older than 18 described in Section 2.3.1, Table 6. Robust standard errors clustered on wives are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Other covariates include wife's and household characteristics; average weekly wages by county as listed in Table A4 in Appendix A.

[b] Other covariates include wife's and household characteristics and wife's predicted hourly wages as listed in Table A10 in Appendix A.

[c] Other covariates include wife's characteristics, average weekly wages by county and wife's predicted number of hours of work as listed in Table A8.

As shown by Model 1 in Table 12, I find that emphysema and asthma are the only health conditions affecting married men's wages. A married man with emphysema experiences a reduction in hourly wages of 18.5%. However, if I consider the duration of the illness (Model 2 and 3) I find that emphysema reduces wages only after one year of illness. If a married man has had emphysema for four years, (i.e., the median duration) hourly wages decrease by 52.62%. Among the other conditions, only asthma has a negative effect on wages in the short (within the first year) and long term (after one year). Wages decrease by 13% if the worker has had asthma for less than one year, and by 26.81% if he has had asthma for 14 years (i.e. the median). Minimum wages can be calculated using the coefficient estimates of Model 3 in Table A16 of Appendix A. A married man with asthma experiences minimum wages if he has had the health condition for 24 years.

Similarly to married men, married women experience a reduction in their hourly wages only for two health conditions: emphysema and stroke. Stroke reduces the hourly wages of a married woman by 22.6%, while emphysema affects wages depending on the duration of the illness. A married woman that has had emphysema for less than one year experiences a reduction in her wages by 43.1%.[37]

In summary, similarly to Bartel and Taubman (1979), I find that the respiratory and circulatory conditions negatively affect hourly wages for men but it is not possible to make a comparison by specific disease and for women because Bartel and Taubman (1979) aggregated conditions to the heart disease group and the

[37] The coefficients of the other controls variables have the expected signs and magnitudes: better educated workers have higher wages; the hourly wages for non-whites and Hispanics are lower than those of white-Caucasians.

respiratory group, they study only men, and they are the only one in the existing literature to have studied the effect on hourly wages.

Labor Supply

As shown by Model 1 in Tables 12 and 13, the conditions studied here do not affect the number of hours a married man or married woman work. (Marginal effects were calculated for a married man or married woman 47 years old, white, non-Hispanic, and with a high school degree). This result may well be driven by the fact that married workers' with the most severe conditions have already dropped out from the labor force. If I control for the duration of the health condition (Model 3) only emphysema and chronic bronchitis affect the number of hours of work of a married man, and only stroke negatively affects the hours of work of a married woman.[38]

If a married man has had emphysema for less than one year then he experiences a reduction by 4.6 hours of work per week. To put things in perspective, in a month this is equivalent of one less part-time workweek. If for example, he has had chronic bronchitis for two years (i.e., the median duration) then he loses two hours per week, that is 100 hours per year.[39] A married man with chronic bronchitis works the least number of hours if he has had chronic bronchitis for 23 years.[40] If a married woman had a stroke less than one year ago she experiences a reduction by about 9 hours of work per week, that is about a full time week per month. Narayan et

[38] Emphysema seems to increase the number of hours of work of a married woman (about 9 hours per week), however, the number of married women with emphysema is very small (32). These results may drive also the positive effect of COPD on married women's hours of work.
[39] Among the other control variables, Table A9 and A10 in Appendix A, mental illness and transfer income decrease the number of hours of work; the dummies for the number of children by age group indicate that husbands with older children work more hours than husbands with younger children. As expected, the husbands' hourly wages positively and significantly affect their labor supply.
[40] Minimum work hours can be calculated using the coefficient estimates of Model 3 in Table A16 of Appendix A.

al. (2000) find that heart disease negatively affects the hours worked by males who are employed in professional jobs but it does not affect the hours of work of men and women employed in other occupational categories including primary sector occupations, services, managerial, and administrative.[41]

2.5.2 Effect of a Spouse's Health Conditions on the Labor Market Decisions and Productivity of the Other Spouse

Labor Force Participation

How does a married woman or a married man of working age respond to the health condition of her/his spouse? Tables 14 and 15 provide estimates of married women's and men's labor force participation decision equations. I find that only married men with cancer, chronic bronchitis, emphysema or COPD affect wives' labor force participation. In particular, cancer has a positive small effect on her likelihood to work (2.1%) if her husband has had cancer less than one year ago. However, if a married man has had a respiratory condition then his wife is less likely to work. The largest effect is associated with having a husband with emphysema for less than one year (-18.7%). In the other cases the effect, even if statistically significant, is very small. The positive effect of cancer on wife's labor force participation is consistent with the results in Berger (1983) and Berger and Fleisher (1984), who find that the wife is more likely to participate if the husband is in poor health.[42]

[41] The primary sector occupations category includes farming, forestry, fishing, precision production, craft, repairs, operators, fabricators and laborers.

[42] Regarding the other conditions that are included as controls (Table A3 and A4 in Appendix A), only a married man's back problems have a slightly significant positive effect on his wife's labor force participation; mental illness and arthritis do not influence her labor force participation. The effect of mental illness is consistent with the finding by Roberts (1999), who does not find any effect of mental illness on the female's labor market participation. In contrast with what I found for the husband, if the wife is Hispanic she is less likely to participate and if her husband served in the military, she is more

Table 14 – Effects of a Married Man's Health Condition on his Wife's Labor Force Participation

Husband's Health Condition	Model 1		Model 2		Model 3	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Cancer	0.4314** (0.1679)	0.0019	0.9122*** (0.2711)	0.0049	0.9498*** (0.2709)	0.0038
Duration			0.0436 (0.0460)	0.0009	0.0023 (0.0984)	0.00002
Severe Cancer	0.1078 (0.1255)	0.0056	0.7066 (0.2926)	0.0057	0.4520** (0.1961)	0.0206
Duration			0.0228 (0.0884)	-0.0008	-0.0194 (0.1012)	-0.0002
Stroke	-0.2179 (0.3412)	-0.0011	1.4512 (0.9644)	0.0071	1.5681 (1.0254)	0.0055
Duration			-0.0912 (0.1612)	0.0006	-0.5819 (0.4109)	-0.0011
Ischemic Heart Disease	0.2357 (0.2393)	0.0011	0.5039 (0.6082)	0.0030	0.5047 (0.6280)	0.0022
Duration			-0.0172 (0.0563)	0.0003	-0.1305 (0.1146)	-0.0002

likely to work. As expected, if there are children in the household then it is less likely that the wife is part of the labor force, though this effect is smaller and less significant as the children become older.

Table 14 – (continued)

Husband's Health Condition	Model 1		Model 2		Model 3	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Emphysema	-0.6245	-0.0035	-7.8456***	-0.2183	-8.0651***	-0.1866
	(0.5596)		(3.0001)		(2.7720)	
Duration			-0.1249**	-0.0114	0.1370	-0.0010
			(0.0634)		(0.2262)	
Chronic Bronchitis	-0.3763***	-0.0020	-0.3352**	-0.0024	-0.3584**	-0.0019
	(0.1383)		(0.1503)		(0.1542)	
Duration			0.0378	0.0000	0.1033	0.0004
			(0.0500)		(0.1778)	
COPD	-0.3686***	-0.0023	-0.3973***	-0.0022	-0.2317*	-0.0020
	(0.1335)		(0.1514)		(0.1279)	
Duration			-0.0826	-0.0002	0.0915	-0.0004
			(0.0599)		(0.0893)	
Asthma	-0.2138	-0.0011	-0.3922	-0.0028	-0.3807	-0.0046
	(0.1907)		(0.3036)		(0.3066)	
Duration			0.0159	0.0003	0.0042	0.00004
			(0.0153)		(0.0431)	

Notes: Each model has been estimated by random effects probit. Marginal effects for the health condition are for discrete change of the dummy variable from 0 to 1. Marginal effects were calculated for the average wife in the sample, who is 46 years old, white, non-Hispanic, and with a high school degree. Each model includes all the health conditions at the same time with the exception of COPD. Separate equations that include COPD and the other health conditions with the exception of emphysema and chronic bronchitis have also been estimated. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include husband's and wife's characteristics, household and area characteristics, dummy variables for the year and month of interview, dummy variables for husbands' arthritis, back problems and mental illness as listed in Table A4 in Appendix A. The sample is the matched sample of married women aged 18-64 with husbands older than 18 described in Section 2.3.1, Table 9. Robust standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table 15 – Effects of a Married Woman's Health Condition on his Husband's Labor Force Participation

Wife's Health Condition	Model 1		Model 2		Model 3	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Cancer	-0.0827	-0.0054	0.2652	0.0080	-0.0464	-0.0051
	(0.1692)		(0.2914)		(0.1759)	
Duration			0.1119**	0.0032	0.2595***	0.0233
			(0.0541)		(0.0989)	
Severe Cancer	-0.0170	-0.0027	0.3894	0.0298	0.0301	0.0044
	(0.1348)		(0.3387)		(0.1850)	
Duration			0.1714	0.0128	0.3560***	0.0424
			(0.1049)		(0.1139)	
					(0.0064)	
Stroke	-0.7474	-0.0538	-1.5430*	-0.0598	-1.0740	-0.1474
	(0.4613)		(0.9102)		(0.7906)	
Duration			-0.2636	-0.0126	-0.0001	-0.0012
			(0.2202)		(0.3885)	
Ischemic Heart Disease	0.1302	0.0083	-0.1532	-0.0049	-0.2315	-0.0265
	(0.3671)		(0.7605)		(0.5170)	
Duration			0.0534	0.0017	-0.0282	-0.0022
			(0.0977)		(0.1901)	

Table 15 – (continued)

Wife's Health Condition	Model 1		Model 2		Model 3	
	Coeff.	Marginal Effect	Coeff.	Marginal Effect	Coeff.	Marginal Effect
Emphysema	-0.0743	-0.0049	9.0022	0.0815	5.3657	0.1428
	(0.6581)		(369.5102)		(108.4817)	
Duration			-0.1043	-0.00004	-0.0739	-0.00002
			(0.1128)		(0.3505)	
Chronic Bronchitis	-0.0764	-0.0050	-0.1124	-0.0036	-0.0766	-0.0084
	(0.1431)		(0.1605)		(0.1172)	
Duration			-0.1029*	-0.0034	-0.0776	-0.0089
			(0.0589)		(0.0931)	
COPD	-0.1084	-0.0188	-0.1486	-0.0077	-0.0821	-0.0092
	(0.1060)		(0.1475)		(0.1176)	
Duration			-0.0849**	-0.0046	-0.0867	-0.0101
			(0.0368)		(0.0822)	
Asthma	-0.2787	-0.0195	-0.3392	-0.0112	-0.1376	-0.0154
	(0.1844)		(0.3737)		(0.2632)	
Duration			0.0072	0.0002	-0.0197	-0.0021
			(0.0131)		(0.0313)	

Notes: Each model has been estimated by random effects probit. Marginal effects for the health condition are for discrete change of the dummy variable from 0 to 1. Marginal effects were calculated for the average husband in the sample, who is 47 years old, white, non-Hispanic, and with a high school degree. Each model includes all the health conditions at the same time with the exception of COPD. Separate equations that include COPD and the other health conditions with the exception of emphysema and chronic bronchitis have also been estimated. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include husband's and wife's characteristics, household and area characteristics, dummy variables for the year and month of interview, dummy variables for wives' arthritis, back problems and mental illness as listed in Table A3 in Appendix A. The sample is the matched sample of married men aged 18-64 with wives older than 18 described in Section 2.3.1, Table 9. Robust standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.

On the other hand, as Model 3 of Table 15 shows, if a wife has had one of the health conditions examined her husband's probability of being a labor force participant is not affected, with the exception of cancer. If his wife has had cancer for more than one year than he is more likely to participate. A man's probability of being in the labor force increases by 9% if his wife has had cancer for 2 years (2 years being the median duration of cancer among the women in my sample) over that of a husband with a healthy wife. The likelihood of participating in the labor force continues to increase with the duration of the wife's cancer until she has had cancer for 10 years, and declines thereafter.

Exact comparisons with other studies by health condition are not possible, since I am the first one to study the effects of specific chronic health conditions on the spouse's labor market decisions. Briefly, Johnson and Favreault (2001) find that a woman delays retirement when her husband reports having a health problem or when he is disabled. Similarly, Pienta (2003) finds that a married individual is less likely to be retired if the spouse reported a disability than if the spouse was not disabled. Berger and Pelkowsky (2004) use the 1992-1993 and 1994-1995 waves of the Health and Retirement Study in the U.S. to estimate the labor force participation responses of families to changes in the health of older family members. They find that if one spouse is working and the other is not and the working spouse gets ill, then it is likely that the healthy spouse will remain out of the labor force; while if the healthy spouse is working and the other spouse is not, then it is most likely that the healthy spouse will continue to work. If both spouses are working, the onset of the health problem

increases the probability that the spouse of the ill individual remains working. If neither spouses are working the healthy spouse is unlikely to return to work.

Labor Productivity

As shown in Table 16, none of the health conditions examined of a married man has a significant effect on his wife's earnings.[43] However, I find that stroke and cancer have a negative significant effect on her hourly wages if the husband has had these health conditions for more than one year (Model 3). As we will see in the next section, the omitted significant effect on earnings might be explained by the fact that hours of work of wives with a husband with stroke or cancer increase.

If for example, I consider one year of illness (i.e., the median duration) I find that the hourly wages of married women with a husband that has had cancer for one year are decreased by 1%, while if they have had a husband with the most severe kinds of cancer for one year the reduction is by 5.5%. Interestingly, the effect on hourly wages of a married woman with a high school degree and a husband with cancer is equivalent to that of a married woman without a high school degree with a healthy husband.

In particular, if the husband had a stroke more than one year ago or has had cancer for more than one year, then the relationship between his wife's wages and the duration of the health condition is *U*-shaped. Her wages are decreasing until a minimum, and then increasing. Using the coefficients of Model 3 in Table A18 in Appendix A, I find that a married woman with a husband who had a stroke experiences minimum wages (-29%) when the husband had the stroke about six years ago (that corresponds at 16% of the sample of men that had a stroke). By contrast, if

[43] The coefficients of the non-health variables are in Tables A5 and A6 in Appendix A.

the husband has had cancer or severe cancer the minimum earnings (-22% for cancer and -29% for sever cancer) are experienced when the husband has had the health condition for about eight years (that is about 13% of the sample of men with cancer or severe cancer).

If instead I explore the effect of a married woman's health condition on her husband's earnings then only emphysema and asthma have a significant negative effect. In addition, all the health conditions examined with the exception of stroke decrease his hourly wages, as displayed in Table 17. A married man with a wife with severe cancer tends to experience a 4.5% reduction in his hourly wages. A man whose wife has had ischemic heart disease has 15% lower wages than of a similar man whose wife is healthy, and 7.7% lower if she has had asthma. Emphysema, chronic bronchitis and COPD affect a married man's wages only if I control for the duration of the illness. Husbands whose wife has had emphysema for less than a year experience a 31.4% reduction in their hourly wages, while if she has had COPD for less than one year then the reduction is by 3.7%.

In addition, a white married man with some college education and with a wife with emphysema experiences a reduction in his hourly wages equivalent to the reduction experienced by a non-white married man without a high school degree and with a healthy wife. Finally, being non-white or Hispanic decreases wages. In particular, the hourly wages of a Hispanic husband are 15% less than the wages of a non-Hispanic man.[44] This is the same effect on hourly wages of a married man with a wife who has had ischemic heart disease.

[44] See Tables A7 and A8 in Appendix A for the coefficients associated with the non-health covariates.

Table 16 – Marginal Effects of a Married Man's Health Condition on his Wife's Labor Market Decisions

Husband's Health Condition	*Dependent Variables*								
	Wife's Log Weekly Earnings[a]			**Wife's Weekly Hours of Work[b]**			**Wife's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cancer	0.0522	0.0143	0.0157	0.3695	-0.6132	-0.6570	0.0307	0.0392	0.0428
	(0.0447)	(0.0665)	(0.0665)	(0.6755)	(1.1198)	(1.1152)	(0.0297)	(0.0470)	(0.0471)
Duration		0.0059	0.0064		0.1011	0.6558**		-0.0040	-0.0321**
		(0.0114)	(0.0231)		(0.1603)	(0.3207)		(0.0086)	(0.0162)
Severe Cancer	0.0145	-0.0685	-0.0637	0.8262	-1.0479	-1.1013	-0.0191	0.0087	0.0154
	(0.0458)	(0.0728)	(0.0725)	(0.7516)	(1.1997)	(1.1972)	(0.0345)	(0.0526)	(0.0524)
Duration		-0.0037	-0.0242		0.0196	0.4636		-0.0054	-0.0427***
		(0.0116)	(0.0212)		(0.1912)	(0.3635)		(0.0118)	(0.0170)
Stroke	0.0998	0.1603	0.1631	-0.3168	-0.0164	0.0178	0.0927	0.1151	0.1152
	(0.1038)	(0.1969)	(0.1945)	(1.4576)	(2.2165)	(2.1899)	(0.0649)	(0.1425)	(0.1426)
Duration		0.0285	0.0433		0.5918	1.9467**		-0.0009	-0.0490
		(0.0175)	(0.0501)		(0.3678)	(0.8070)		(0.0139)	(0.0327)
Ischemic Heart Disease	-0.0053	0.0433	0.0381	0.7306	0.1972	0.1375	-0.0273	0.0648	0.0624
	(0.0699)	(0.1294)	(0.1296)	(0.9643)	(2.0811)	(2.0814)	(0.0502)	(0.0688)	(0.0690)
Duration		-0.0063	-0.0085		-0.0268	-0.1515		-0.0087	-0.0064
		(0.0135)	(0.0187)		(0.1447)	(0.2311)		(0.0114)	(0.0145)
Emphysema	-0.0948	0.0000	0.0000	1.3576	0.0000	0.2015	-0.1068*	-0.0517	-0.0274
	(0.1204)	(0.0000)	(0.0000)	(1.9033)	(0.0000)	(3.2730)	(0.0635)	(0.0791)	(0.1024)
Duration		0.0034	-0.0098		0.3166	0.1681		-0.0076	-0.0106
		(0.0171)	(0.0296)		(0.3010)	(0.5148)		(0.0127)	(0.0186)

Table 16 – (Continued)

Husband's Health Condition	*Dependent Variables*								
	Wife's Log Weekly Earnings[a]			**Wife's Weekly Hours of Work[b]**			**Wife's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Chronic Bronchitis	0.0429	0.0371	0.0350	0.3030	0.2793	0.2728	0.0019	0.0032	0.0013
	(0.0328)	(0.0350)	(0.0351)	(0.5695)	(0.6282)	(0.6307)	(0.0250)	(0.0265)	(0.0266)
Duration		-0.0078**	-0.0127		0.0472	0.0958		-0.0092**	-0.0219
		(0.0038)	(0.0187)		(0.0841)	(0.2968)		(0.0036)	(0.0175)
COPD	0.0289	0.0378	0.0359	0.4066	0.2602	0.2510	-0.0056	0.0061	0.0041
	(0.0337)	(0.0352)	(0.0354)	(0.5759)	(0.6296)	(0.6324)	(0.0238)	(0.0267)	(0.0269)
Duration		-0.0051	-0.0122		0.1239	0.2435		-0.0087*	-0.0174
		(0.0055)	(0.0194)		(0.1115)	(0.3186)		(0.0045)	(0.0142)
Asthma	0.0215	-0.0262	-0.0291	-0.5770	-0.9725	-1.0011	0.0430	0.0137	0.0134
	(0.0459)	(0.0815)	(0.0816)	(0.7621)	(1.3536)	(1.3527)	(0.0322)	(0.0635)	(0.0636)
Duration		0.0042	0.0003		0.0079	-0.0487		0.0051***	0.0039
		(0.0032)	(0.0037)		(0.0558)	(0.0629)		(0.0018)	(0.0024)

Notes: The estimated coefficients are presented in Table A18 in Appendix A. Each model includes all the health conditions at the same time with the exception of COPD. Separate equations have been estimated for COPD, which include all the health conditions at the same time with the exception of emphysema and chronic bronchitis. "Duration" refers to the number of years that the individual has had a health condition. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition linearly; and Model 3 also includes a quadratic term of the duration of the health condition. Each model accounts for sample selection by including inverse Mills ratio for each round of interview *t*. Each model also includes dummy variables for the year and month of interview and dummy variables for husbands' arthritis, back problems and mental illness. The sample is the matched sample of married women aged 18-64 with husbands older than 18 described in Section 2.3.1, Table 9. Robust standard errors clustered on wives are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Other covariates include wife's and household characteristics; average weekly wages by county as listed in Table A4 in Appendix A.

[b] Other covariates include wife's and household characteristics and wife's predicted hourly wages as listed in Table A10 in Appendix A.

[c] Other covariates include wife's characteristics, average weekly wages by county and wife's predicted number of hours of work as listed in Table A8.

Table 17 – Marginal Effects of a Married Woman's Health Condition on her Husband's Labor Market Decisions

Wife's Health Condition	*Dependent Variables*								
	Husband's Log Weekly Earnings[a]			**Husband's Weekly Hours of Work[b]**			**Husband's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cancer	0.0188	0.0527	0.0513	0.6457	0.3714	0.3655	-0.0249	0.0243	0.0223
	(0.0285)	(0.0414)	(0.0414)	(0.5212)	(0.7049)	(0.7039)	(0.0256)	(0.0369)	(0.0368)
Duration		0.0016	-0.002		0.1341	-0.0315		-0.0050	0.0030
		(0.0086)	(0.0140)		(0.1932)	(0.2706)		(0.0066)	(0.0113)
Severe Cancer	-0.0123	0.0124	0.0114	0.4723	0.1785	0.1857	-0.0458*	-0.0012	-0.0036
	(0.0300)	(0.0426)	(0.0426)	(0.5589)	(0.7262)	(0.7252)	(0.0272)	(0.0383)	(0.0383)
Duration		-0.0002	-0.0034		0.0172	-0.0932		0.0025	0.0085
		(0.0095)	(0.0153)		(0.2134)	(0.3063)		(0.0068)	(0.0123)
Stroke	-0.0478	0.4650**	0.4605**	-1.7587	4.6065	4.5596	0.0613	0.1656	0.1536
	(0.0965)	(0.1834)	(0.1841)	(1.3283)	(4.6067)	(4.6011)	(0.0826)	(0.1995)	(0.2006)
Duration		-0.0245	0.0273		-0.0915	0.7626		-0.0242	-0.0392
		(0.0257)	(0.0549)		(0.4432)	(0.7852)		(0.0202)	(0.0510)
Ischemic Heart Disease	-0.1163	-0.0440	-0.0404	0.7438	1.5249	1.6230	-0.1617***	-0.1556	-0.1616
	(0.0751)	(0.1364)	(0.1371)	(1.4471)	(1.9979)	(1.9852)	(0.0590)	(0.1358)	(0.1366)
Duration		0.0166	0.0194		0.3464	-0.5760		-0.0075	0.0594
		(0.0257)	(0.0490)		(0.4603)	(0.8097)		(0.0185)	(0.0376)
Emphysema	0.1083	-0.5758***	-0.5662***	0.0040	-3.2913***	-3.1176***	0.0918	-0.3843***	-0.3772***
	(0.1149)	(0.0568)	(0.0551)	(2.0335)	(1.1393)	(1.1153)	(0.0875)	(0.0680)	(0.0656)
Duration		0.0053	0.0241		-0.1730	-0.0131		0.0146	0.0257
		(0.0175)	(0.0343)		(0.2707)	(0.6579)		(0.0144)	(0.0193)

Table 17 – (continued)

Wife's Health Condition	*Dependent Variables*								
	Husband's Log Weekly Earnings[a]			**Husband's Weekly Hours of Work[b]**			**Husband's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Chronic Bronchitis	-0.0069	0.0020	0.0020	0.4359	0.6817	0.6916	-0.0302	-0.0380	-0.0399*
	(0.0245)	(0.0254)	(0.0254)	(0.4719)	(0.5076)	(0.5070)	(0.0211)	(0.0232)	(0.0232)
Duration		-0.0137*	0.0020		-0.1501	0.0282		-0.0038	-0.0045
		(0.0072)	(0.0190)		(0.1053)	(0.3341)		(0.0059)	(0.0136)
COPD	-0.0029	0.0004	0.0002	0.4545	0.6358	0.6425	-0.0276	-0.0363	-0.0381*
	(0.0243)	(0.0255)	(0.0255)	(0.4669)	(0.5083)	(0.5078)	(0.0210)	(0.0230)	(0.0230)
Duration		-0.0096	0.0097		-0.1251	0.1120		-0.0018	0.0012
		(0.0080)	(0.0151)		(0.1086)	(0.2646)		(0.0064)	(0.0114)
Asthma	-0.0577*	-0.0853*	-0.0851*	0.4975	-0.3689	-0.3554	-0.0807***	-0.0550	-0.0544
	(0.0298)	(0.0511)	(0.0511)	(0.5695)	(1.0526)	(1.0531)	(0.0238)	(0.0399)	(0.0399)
Duration		-0.0004	-0.0012		-0.0164	0.0105		0.0002	-0.0019
		(0.0020)	(0.0031)		(0.0342)	(0.0601)		(0.0018)	(0.0026)

Notes: The estimated coefficients are presented in Table A19 in Appendix A. Each model includes all the health conditions at the same time with the exception of COPD. Separate equations have been estimated for COPD, which include all the health conditions at the same time with the exception of emphysema and chronic bronchitis. "Duration" refers to the number of years that the individual has had a health condition. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition linearly; and Model 3 also includes a quadratic term of the duration of the health condition. Each model accounts for sample selection by including inverse Mills ratio for each round of interview *t*. Each model also includes dummy variables for the year and month of interview and dummy variables for wives' arthritis, back problems and mental illness. The sample is the matched sample of married men aged 18-64 with wives older than 18 described in Section 2.3.1, Table 9. Robust standard errors clustered on husbands are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Other covariates include husband's and household characteristics; average weekly wages by county as listed in Table A3 in Appendix A.

[b] Other covariates include husband's and household characteristics and husband's predicted hourly wages as listed in Table A9 in Appendix A.

[c] Other covariates include husband's characteristics, average weekly wages by county and husband's predicted number of hours of work as listed in Table A7.

Labor Supply

In sum, a married man's health condition (and cancer and stroke in particular) significantly decreases his wife's hourly wages but not her weekly earnings. This can be explained by analyzing how the husband's health condition affects his wife hours of work per week.[45] Table 16 shows that the only two health conditions that affect wives' labor supply are cancer and stroke, and that the relationship between the duration of the husband's health condition and his wife's hours of work has an *inverted U* shape. The maximum value is found to be 2.8 weekly hours when the husband has had cancer for three years and 12.45 hours when the husband had a stroke eight years ago. After three years of cancer or eight years past a stroke the wife starts working less. This means an annual reduction by 140 and 622.5 hours for cancer and stroke respectively.

Since women with a husband with cancer are also more likely to participate in the labor force, my results suggest that wives may have to compensate for the ensuing loss in household income by working more hours or entering the labor force.

In contrast, as Table 17 shows, if a married woman is sick her husband's hours of work per week are not significantly affected, with the exception of emphysema. If a married man has had a wife with emphysema for less than one year he works 3.12 hours per week less, that is in a year a reduction by 156 hours of work, which corresponds to almost a month of work less.

The positive effect of a health conditions on the spouse's hours of work is consistent with previous research, even if I cannot make comparisons at the disease level because there are no such studies in the literature. Parsons (1977) finds that a husband's work-limiting health condition has a positive and slightly significant effect on the wife's

[45] The coefficients of the non-health variables are presented in Tables A9 and A10 in Appendix A.

hours of work. Similarly, Berger (1983) finds that the wife works about 140 hours more per year if the husband is in poor health.[46] However, Boaz and Muller (1992) find that people who are the caregivers of elderly parents reduce their hours of work from full-time to part-time. Similarly, Ettner (1995a, b) finds that women aged 19 and over work less if they are living with an elderly disabled parent. On the other hand, Wolf and Soldo (1994) do not find any effect of caregiving on hours of work of married women.

2.6 Conclusions

Protecting the health of the citizens from environmental pollutants is a major goal for many government agencies. The Cost-of-Illness approach is a common approach used to quantify the benefits from reducing the probability of contracting a disease. Lost work income along with health care costs is a measure of the indirect costs avoided because of health improvements. This chapter has explored the impact of specific health conditions previously linked with exposure to environmental pollutants on labor force participation, hours of work, weekly earnings, and hourly wages of married men and women. This is the first study to focus on specific health conditions of interest to environmental protection agencies and to examine their impact on the worker and the spouse.

I have found that all the health conditions examined (cancer, stroke, ischemic heart disease, emphysema, and asthma), with the exception of chronic bronchitis and COPD, significantly reduce the probability that a married man participates in the labor force, although the effects differ by disease and duration of the illness. Among the health conditions studied, stroke and emphysema have the largest negative effects (-29% and -

[46] Roberts (1999) shows that the presence of a mentally ill family member significantly reduces the hours of work of both females and males. My results for mental illness are consistent with Roberts (1999): if a married woman has a husband with mental illness she works about 35 hours less per year.

23%, respectively). Smaller effects are associated with severe cancer (-15%), ischemic heart disease (-9.8%), asthma (-6.9%) and cancer that includes non-melanoma skin cancers (-4.6%). I have also found that the relationship between health conditions' duration and own labor force participation is a *U*-shaped. The labor force participation decreases until a minimum and then, it starts increasing.

In contrast to married men, the effect of a married woman's health condition on her labor force participation, even if statistically significant, is very small (the largest negative effect is associated with ischemic heart disease and stroke, -5.8% and -5.1% respectively). In addition, among married people who are working, having had one of the health conditions examined does not have a strong effect on own earnings, hourly wages or hours of work, with the exception of ischemic heart disease, stroke and emphysema. This might be due to the fact that married people with the most severe conditions have already decided not to participate in the labor force.

Finally, I have also examined the effect of a spouse's health condition on the other spouse's labor market decisions. I have found that having a spouse with one of the health conditions examined does not affect the labor force participation of the other spouse with the exception of cancer and emphysema. A married man or woman with a spouse with cancer is more likely to be a labor force participant, while a married man with a wife with emphysema is less likely to participate in the labor force. However, for each additional year of illness the marginal effect of the cancer's duration is decreasing.

My findings also show that a man married to a woman with one of the health conditions examined experiences the largest impact in a reduction in his wages (-15% if his wife has had ischemic heart disease, -31.4% if she has had emphysema, -7.7% if she has had asthma). Married women whose husband has had cancer or has had a stroke

experiences a reduction in their wages and an increase in their hours of work. In addition, I have found that the relationship between the duration of the husband's health condition and his wife's hours of work has an *inverted U* shape, while the relationship between the duration of the husband's health condition and his wife's wages is *U*-shaped. My results also suggest that if a married man has one of the health conditions examined he is less likely to participate in the labor force, and his wife is more likely to participate or work more in order to compensate for the ensuing loss in family income due to the spouse's illness. These findings are of importance in informing national health policies, for which it is often necessary to examine the effects of reducing cases of heart disease, respiratory illness and cancer; and more generally, in designing social programs.

Chapter 3: Children's Chronic Health Conditions and Parents' Labor Market Decisions in the United States: The Role of Asthma

3.1 Introduction

One of the leading chronic diseases in children in the United States is asthma. In 2006, about 9.9 million children under 18 years of age (14%) had asthma diagnosed at some time in their lives; and about 6.6 million children (9%) currently have asthma (Bloom and Cohen, 2007). In 2002, it was one of the leading causes of school absenteeism: children 5-17 missed 14.7 million school days a year because of asthma (Centers for Disease Control and Prevention, 2004). In 1999 asthma was the third most important cause of hospitalization among children under 15 years of age (Popovic, 2001).

Although the causes of asthma are not yet fully understood, exposure to indoor and outdoor air pollution has been shown to exacerbate asthma (Institute of Medicine, 2000; U.S. Environmental Protection Agency, 1996a and 1996b). An individual with asthma may suffer attacks through exposure to household allergens such as dust, mites, cockroaches, molds, and pets, as well as environmental pollutants such as ozone, sulfur dioxide, particulate matter, and second-hand tobacco smoke[47] The World Health Organization (WHO) review of the health effects of air pollution on children's health concludes that there is sufficient evidence to assume a causal relationship between air pollution exposure and aggravation of asthma in children (WHO, 2005).

[47] Eskenazi et al. (1999) postulate a link between the development of asthma and exposure to certain pesticides.

Landrigan et al. (2002) estimate that 30% of childhood asthma is due to environmental exposures.[48] Because air pollution may exacerbate asthma severity, economists have had to confront the question of the economic value of reducing an asthmatic attack for measuring the benefits of an environmental policy. Economists have often valued the economic benefits of a reduction in asthma attacks in children by applying the Cost-of-Illness approach (COI). Landrigan et al. (2002) estimate that the environmentally attributable annual cost of asthma is $2.0 billion[49]

Cost-of-Illness studies that focus on children's health do not take into account the impact of children's health on the labor market decisions of parents. For example, they consider the costs for medicine and doctors visits, and the occasional costs associated with lost days of work and school, but not the fact that having a child with asthma could result in a change in the labor force participation of parents.

This chapter explores how the presence of an asthmatic child affects (i) mothers' participation in the labor force; (ii) the number of work hours of mothers and fathers, (iii) mothers' and fathers' earnings and hourly wages, and (iii) how child's health is affected by mothers' labor force participation and hours of work. I use as a measure of child's health the number of lost school days. I consider single mothers, and mothers and fathers

[48] Landrigan et al. (2002) do not include in the definition of "environmental exposure" household allergens from pets, insects, and molds, second hand tobacco smoke, and infections. They consider only "outdoor, nonbiologic pollutants from sources potentially amenable to abatement, such as vehicular exhaust and emissions from stationary sources." They also estimate that 100% of all cases of lead poisoning is of environmental origin; at least 5-10% and less than 80-90% of childhood cancer can be attributed to toxic chemical in the environment; 10% of neurobehavioral disorders, such as dyslexia, attention-deficit hyperactivity disorder (ADHD), diminished intelligence, autism, and mental retardation are at least partly caused by toxic exposures, not including alcohol, tobacco, or drug abuse.

[49] Landrigan et al. (2002) estimate that the total annual costs of environmentally attributable children diseases is $54.9 billion. Of this amount, $43.4 billion is due to lead poisoning, $2.0 billion to asthma, $0.3 billion to childhood cancer, and $9.2 billion to neurobehavioral disorders, such as dyslexia, attention-deficit hyperactivity disorder (ADHD), diminished intelligence, autism, and mental retardation.

with partners. I compare the effects of asthma to the effects of a set of health conditions that includes deformities, congenital anomalies, heart problems, epilepsy, and cancer.

The analysis is based on data from the Medical Expenditure Panel Survey (MEPS) for U.S. households with children 0-17 years old from 1996 to 2002. This dataset has the advantage of providing detailed information on labor supply, labor force participation, wages and demographic characteristics of each parent in the household, in addition to the number of lost school days and demographic characteristics of each child in the household.

Asthma management activities generate an additional demand on parents' time, however, they also allow a child to achieve a normal quality of life (WHO, 2007). Asthmatic children that miss flu shots, do not receive check-ups regularly, live in a household with allergens, do not receive a peak flow meter or do not receive a refill for their asthma medications are at a high risk of an asthma attack (Smith et al., 2002).

Parents' employment may undermine the health care and supervision of their children. Smith et al. (2002) emphasize that a "substantial proportion" of their sample of parents with chronically ill children said that their children missed medical appointments because they could not take time away from work. However, Case et al. (2002) show that children's health is positively related to household income and the difference between poor and non-poor children is more pronounced as children age. In addition, Currie and Stabile (2003) provide evidence that "the relationship between health, family income and age mostly arises because low-income children are more likely to be subject to health shocks."

Most of the literature on children's health has focused on disability or general health status. There are only two papers I am aware of that have looked at the effect of

asthma on the labor market decisions of mothers (Feng and Reagan, 2004; and Bayder et al., 2007). None of these papers have explored how mothers' labor market decisions in turn affect the health of the asthmatic child. Neither have they investigated how the presence of an asthmatic child or of a child with deformities, congenital anomalies, heart problems, epilepsy or cancer affects mothers' productivity, and fathers' labor market decisions.

Children affect the time and budget constraints of the entire household, and although child care has traditionally been viewed as the wife's responsibility, women's role in the labor market has changed significantly in the last decades. There are only two papers I am aware of that study the effect of children's health on fathers' labor supply and wages (Case et al., 2002; and Corman et al., 2005b), and none of these studies considers asthmatic children. I find that fathers with partners and with an asthmatic child less than six years old work 59 hours more per year, and experience a decrease in their hourly wages by 4.8%. To illustrate, the hourly wage of a white father with an asthmatic child is equivalent to that of a non-white father with a healthy child.

I also find that a child with asthma does not significantly affect mothers' labor force participation for both single mothers and mothers with partners. However, I find that if the mother participates in the labor market, a child is more likely to lose days of school than if the mother does not participate. This effect holds equally for asthmatic children and for children without a serious chronic health condition such as deformities, congenital anomalies, heart problems, epilepsy or cancer. The effect is larger for children whose mother has a college degree than a high school degree, and for children with a single mother.

In addition, I find that single mothers with a child in school age 6-11 who has deformities, congenital anomalies, heart problems, epilepsy or cancer are 4.3% more likely to work or to be looking for a job. However, I also find that a child with any of the aforementioned health conditions, and whose mother has a high school degree is less likely to experience lost school days if the mother works than if she does not work. These results should not be interpreted as indicating that the family is better off if the mother participates in the labor force neither that the impacts on lost school days are the only relevant welfare effect.

My results suggest that single mothers are the most affected group. In a year, single mothers with an asthmatic child less than six years old work almost two full weeks less than mothers with a non-asthmatic child. By comparison, the effect of having an asthmatic child less than six years old on the hours of work of a single mother is equivalent to having one more child without asthma less than six years old. I also find that single mothers with a child with deformities, congenital anomalies, heart problems, epilepsy or cancer and less than six years old earn about 24.8% and 29.8% less than single mothers and mothers with partners without a child with any of these health conditions, respectively.

This chapter is organized as follows. Section 3.2 provides some background information on asthma. Section 3.3 presents an overview of the previous literature on parents' labor market decisions and children's health. Section 3.4 describes the data and the sample selection. Section 3.5 outlines the empirical specifications used. Section 3.6 presents the results, and Section 3.7 presents the conclusions.

3.2 Background on Asthma

Asthma causes recurrent and distressing episodes of wheezing, breathlessness, chest tightness, and nighttime or early morning coughing (NCEH, 2005). Asthma produces its effects through airway inflammation and airflow limitation (Holgate, 1999 and Holt et al., 1999). As Figure 1 shows when asthma is under control (diagram on the left) air flows easily in and out through the airways. When asthma is not under control, the airways in the lungs are swollen and constrict, and less air passes in and out. Mucus is produced as well, which further restrict airflow (diagram on the right) (National Center for Environmental Health, 2005).

The tendency to develop asthma can be related to a genetic component (Pearce et al., 1999) but, as U.S. EPA (2003) emphasizes, not all children with asthma have families with a history of the disease. The causes of asthma are not yet well understood but asthma attacks can be exacerbated by some environmental factors, such as tobacco smoke, dust mites, furred and feathered animals, molds and chemicals (Institute of Medicine, 2000).

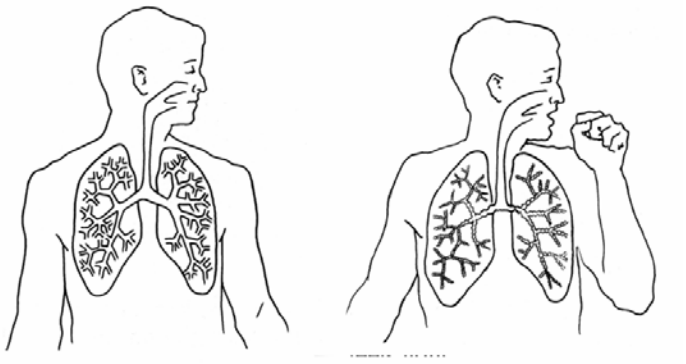

Figure 1 – Pathology of Asthma (Source: NCEH, 2005)

In diagnosing asthma, the doctor asks questions about the family's asthma and allergy history, performs a physical exam, and orders laboratory tests (e.g. spirometry, peak flow meter tests), which involve blowing into devices that can measure how well

the lungs are performing (NCEH, 2005). Control of asthma requires treatment and management of the condition. This implies access to health care, regular consultation with a physician, receiving education about self-management of asthma, and taking daily medications to control asthma (NCEH, 2005). Medication is also an important part of asthma control. According to guidelines from the National Heart, Lung, and Blood Institute (NHLBI) (2007), any person who has symptoms more than twice a week, and particularly people who experience symptoms every day, should be on one or more of the medications that are used to control asthma.

Bloom and Cohen (2007) using data from the National Health Interview Survey for year 2006 find that boys are more likely than girls to have ever been diagnosed with asthma (16% versus 11%) or to currently have asthma (11% and 8%); non-Hispanic black children were more likely to have ever been diagnosed with asthma or to currently have asthma (17% and 13%) than Hispanic children (13% and 9%) or non-Hispanic white children (13% and 9%); children in poor families were more likely to have ever been diagnosed with asthma or to currently have asthma (18% and 14%) than children in families that were not poor (13% and 8%), and finally, children in fair or poor health were 3.5 times as likely to have ever been diagnosed with asthma and 4.5 times as likely to currently have asthma (41% and 37%) as children in excellent or very good health (12% and 8%).

3.3 Literature Review

There is growing evidence that children's poor health can affect parents' labor market outcomes. Powers (2003) provides a summary of the literature on the effects of a child in poor health on the labor market decisions of mothers. Most of the studies she

reviews found that the presence of a disabled child in the household reduces mothers' labor force participation (for example, Salkever, 1990; Wolfe and Hill, 1995; Lukemeyer et al., 2000; Kuhthau and Perrin, 2001; Powers, 2001, and Corman et al., 2005a). However, Breslau et al. (1982) find a negative effect only for poor or black married mothers, Salkever (1982) finds that single mothers with disabled children are more likely to work, while Kimmel (1997 and 1998), and Acs and Loprest (1998) report insignificant effect on the labor force participation of single mothers.

There is also no consensus on the effect of a child health on parents' labor supply. For example, while Salkever (1982 and 1990) finds no evidence of an association between a child's health and mothers' hours of work, Powers (2003) and Wolfe and Hill (1995) find a negative significant effect. Most recently, Corman et al. (2005a) find that mothers of children in poor health work about four hours a week less than other mothers. However, they focus on the low end of the socioeconomic spectrum. The sample used for this analysis is the 1998-2000 Fragile Families and Child Wellbeing Study, and the attention is restricted to extreme conditions, which are experienced by only six percent of the children.[50] The discrepancies in the results between studies can be explained by the small sample sizes of children with disabilities, and the different measures of poor child health used in the different studies (Powers, 2003).[51]

Gould (2004) explores how children's health affects the decision to work and work hours of single and married mothers by distinguishing between three categories of illnesses: (i) illnesses that require little parental time but are expensive; (ii) illnesses that

[50] They consider a child to have poor health if at least one of the following criteria is met: the child weighed less than 4 pounds at birth, the mother reported at follow-up that the child had a disability, or the child was neither walking nor crawling by the time of the follow-up interview 12 to 18 months.
[51] Measures of poor child health are for example physical activity limitations in every day activities or at school, diagnoses of autism, mental retardation or use of walking aids.

are very time consuming; and (iii) illnesses that require care at unpredictable times of the day. She uses the 1997 Panel Study of Income Dynamics (PSID) Child Development Supplement (CDS) and she considers children 0-12 years old. Gould finds that single mothers are less likely to work or work fewer hours if the child has a health condition whose treatment is very time consuming, while married mothers are less likely to work or work fewer hours if their child has a health condition that requires care at unpredictable times of the day. Gould concludes that "model specifications that aggregate across illnesses are incapable of disentangling these effects and may therefore underestimate the welfare costs of having a sick child in the family."

How the presence of an asthmatic child affects parents' labor market decisions has remained largely unaddressed. To the best of my knowledge, only two studies have addressed this question. Feng and Reagan (2004) study the impact of an asthmatic child on the labor force participation and hours of work of mothers using data from the National Longitudinal Survey of Youth from 1986 to 2000. They find a negative effect of asthma on single mothers' labor force participation and their hours of work. No effect is found for married mothers. They do not investigate the effect on the earnings of mothers nor the effects on fathers' labor market decisions. They do not examine how mothers' labor decisions affect the severity of the child's illness. Bayder et al. (2007) explore the effect of having an asthmatic child on the likelihood of mothers of working part-time or full-time or of retaining a full-time job. Using data from the 1996-1999 Medical Expenditure Panel Survey they find that mothers who had a child with asthma were less likely to be employed full-time or part-time, and if single, they were less likely to retain their full-time jobs than other mothers. The employment of single mothers was affected

more than that of married mothers. They do not explore the effects on fathers' market decisions nor the effect on mothers' earnings.

Finally, there have been only few papers that study the effect of children on men's labor supply and wages. Pencavel (1986) finds that children significantly increase the number of hours of work of men in the 1980 U.S. Census, while Waldfogel (1998) uses the 1980 and 1991 National Longitudinal Surveys and finds that men have higher wages if they have two or more children. In addition, Lundberg and Rose (2002) show that sons increase men's hours of work and wage rates significantly more than daughters. In contrast, Angrist and Evans (1998) do not find any significant effect of the birth of a third child on the labor supply of men and women.

There are only two papers that explore the effect of children's health status on fathers' labor market decisions. Case et al. (2002) explore this issue using data from the 1997 Panel Survey of Income Dynamics (PSID). They consider children with low birth weight or who have been in a neonatal intensive care unit. They do not find any significant effect of having a child with these conditions on fathers' labor force participation. Corman et al. (2005b) restrict their attention to the low end of the socioeconomic spectrum and to extreme childhood conditions, which are experienced by only six percent of the children.[52] The sample used for their analysis is the Fragile Families and Child Wellbeing Study. They find that having a young child in poor health reduces fathers' probability of participating in the labor force by eight percentage points and reduces their hours of work by five to six hours per week.

[52] They consider a child to have poor health if at least one of the following criteria is met: the child weighed less than 4 pounds at birth, the mother reported at follow-up that the child had a disability, or the child was neither walking nor crawling by the time of the follow-up interview 12 to 18 months.

3.4 Data Description and Sample Selection

The data used in this chapter are from the 1996-2002 Medical Expenditure Panel Survey (MEPS) described in Section 2.3. The analysis is restricted to two-parent and one-parent (i.e., single) families of working age (under 65 years old) with children aged 17 or under. I exclude single fathers because of the very low sample size (only 2.2% of the total sample consists of singles fathers versus 16.6% for single mothers). For the same reason, I concentrate only on working fathers (only 1.04% of the fathers are not participating in the labor force). I also exclude households where at least one parent (i) reported any physical disability or is (ii) retired, (iii) a student or (iv) less than 18 years old.[53] I further drop the observations where education or income is missing. Since part of the purpose of my research is to study how children's health affects parents' earnings I also exclude the panels with oversampling of low-income households (that is panels 2, 7, 8 and 9).[54] The final sample has 73,109 observations, which correspond to 18,496 mothers and fathers, that is 7,759 mothers with partners, 3,058 single mothers, and 7,679 fathers with partners.[55]

For the purpose of this study, I generate a category of health conditions which includes deformities, congenital anomalies, epilepsy, heart problems and cancer. I define as ill a child that has asthma or any of the aforementioned health conditions. Table B2 in Appendix B provides a definition of each health condition.

Table 18A presents the percentage of mothers and fathers in the sample with at least one ill child. About 15% of the sample has an ill child. About 12% have a child with

[53] I define as disabled the individual who declared that the main reason why he/she is not working is because he/she is unable to work because ill or "disabled."
[54] However, results obtained by using all the panels (years 1996-2004) are presented in Appendix B.
[55] Mothers with partners account for 34,615 observations, single mothers for 12,446 observations, and fathers with partners for 26,048 observations. Note that "observations" refers to the number of people in the sample multiplied by the number of times each is interviewed.

asthma and 7% with deformities, congenital anomalies, heart problems, epilepsy or cancer. In addition, single mothers have a higher percentage of asthmatic children than mothers with partners (14% versus 11%), while children with deformities, congenital anomalies, heart problems, epilepsy or cancer are slightly less present in single mothers' families than in the families of mothers and fathers with partners (6.4% versus 7.4%). About 7% of mothers (120 mothers) and 6% of fathers with at least one ill child have at least one child with both asthma and one of the following conditions: deformities, congenital anomalies, heart problems, epilepsy or cancer.

Table 18B shows that 54% of mothers (696 individuals) and 53% of fathers (450 individuals) with at least one asthmatic child report having at least one asthmatic child during their first MEPS interview. This implies that the remaining 46% of mothers (588 individuals) and 47% of fathers (395 individuals) with at least one asthmatic child have a child who developed asthma for the first time after the first round of interviews. About 17% of mothers with at least one asthmatic child have a child who developed asthma for the first time between the first and the second round of interviews, 14.3% between the second round and the third round of interviews, 7.5% between the third round and the fourth round of interviews, and 6.5% between the fourth round and the fifth round of interviews. In comparison, 58.3% of mothers (438 individuals) and 56.7% of fathers (334 individuals) with at least one child with deformities, congenital anomalies, heart problems, epilepsy or cancer report having at least one child with the aforementioned health conditions during their first MEPS interview. Forty-three percent of mothers (335 individuals) and 42% of fathers (238 individuals) with at least one child with deformities, congenital anomalies, heart problems, epilepsy or cancer have a child who experienced one of these health conditions for the first time during the survey period.

Table 18A – Percentages of Mothers and Fathers with at Least One ill Child

	Sample of Single Mothers and Mothers with Partners		Sample of Mothers with Partners		Sample of Single Mothers		Sample of Fathers	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
At least one ill child								
Total	1,928	12.48	1,350	17.40	578	18.90	1,332	17.35
Child Age 0-5	666	6.16	450	5.80	216	7.06	444	5.78
Child Age 6-11	895	8.27	628	8.09	267	8.73	621	8.09
Child Age 12-17	778	7.19	547	7.05	231	7.55	538	7.01
At least one asthmatic child								
Total	1,284	11.87	859	11.07	425	13.90	845	11.00
Child Age 0-5	452	4.18	289	3.72	163	5.33	287	3.74
Child Age 6-11	624	5.77	416	5.36	208	6.80	411	5.35
Child Age 12-17	476	4.40	328	4.23	148	4.84	320	4.17
At least one child with a "severe condition"								
Total	773	7.15	577	7.44	196	6.41	572	7.45
Child Age 0-5	248	2.29	181	2.33	67	2.19	177	2.30
Child Age 6-11	319	2.95	243	3.13	76	2.49	240	3.13
Child Age 12-17	344	3.18	251	3.23	93	3.04	250	3.26
Total Number of Mothers/Fathers	10,817		7,759		3,058		7,679	

Notes: The samples refer to the 1996-2002 MEPS data where I exclude single fathers, households where at least one parent is (i) disabled or (ii) retired or (iii) a student or (iv) less than 18 years old; or (v) older than 64. A child is defined as ill if he/she has asthma, deformities, congenital anomalies, epilepsy, heart problems or cancer. A child is defined as healthy if he/she does not have any of these health conditions. A child has a "severe condition" if he has deformities, congenital anomalies, heart problems, epilepsy or cancer. Table B1 in the Appendix defines each condition.

Table 18B - Percentages of Mothers and Fathers with at Least One Ill Child Who Developed the Illness for the First Time during the Survey Period

	Round of Interview										
	1		2		3		4		5		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Total
Mothers with…											
At least one asthmatic child	696	54.18	224	17.47	184	14.30	97	7.53	84	6.52	1284
At least one with a "severe condition"	438	56.69	119	15.36	97	12.58	75	9.67	44	5.70	773
Fathers with…											
At least one asthmatic child	450	53.29	127	15.05	136	16.14	73	8.62	58	6.90	845
At least one with a "severe condition"	334	58.31	79	13.90	66	11.62	56	9.79	36	6.38	572

Notes: The samples refer to the 1996-2002 MEPS data where I exclude single fathers, households where at least one parent is (i) disabled or (ii) retired or (iii) a student or (iv) less than 18 years old; or (v) older than 64. A child is defined as ill if he/she has asthma, deformities, congenital anomalies, epilepsy, heart problems or cancer. A child is defined as healthy if he/she does not have any of these health conditions. A child has a "severe condition" if he has deformities, congenital anomalies, heart problems, epilepsy or cancer. Table B1 in the Appendix defines each condition.

Table 19 – Descriptive Statistics: Sample of Mothers Aged 18-64

	Total Sample		Mothers with a Healthy Child		Mothers with an Ill Child	
Variables	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Dependent Variables						
Mother in Labor Force	0.770	0.421	0.774	0.418	0.750	0.433
Mother's Weekly Earnings	519.8	368.9	522.1	370.8	506.8	357.6
Mother's Hourly Wage	13.58	8.211	13.59	8.210	13.53	8.219
Mother's Weekly Hours of Work	37.56	10.92	37.67	10.93	36.97	10.82
Mothers' Characteristics						
Age	35.54	7.996	35.45	8.067	36.05	7.564
Age 18-24	0.095	0.293	0.099	0.299	0.069	0.254
Age 25-34	0.354	0.478	0.357	0.479	0.338	0.473
Age 35-44	0.412	0.492	0.402	0.490	0.463	0.499
Age 45-54	0.134	0.340	0.136	0.343	0.121	0.326
Age 55-64	0.006	0.080	0.006	0.077	0.009	0.097
Years of education	12.48	3.038	12.46	3.066	12.56	2.876
No high-school degree	0.230	0.421	0.232	0.422	0.220	0.415
High-school degree	0.333	0.471	0.332	0.471	0.339	0.474
Some college	0.231	0.421	0.228	0.420	0.246	0.431
College	0.205	0.404	0.207	0.405	0.194	0.395
Non-white	0.203	0.403	0.202	0.402	0.210	0.407
Hispanic	0.277	0.448	0.281	0.450	0.253	0.435
Served in the military	0.013	0.114	0.013	0.113	0.015	0.121
Single	0.264	0.441	0.261	0.439	0.283	0.450
Household's Characteristics						
Number of children age 0-5	0.646	0.793	0.647	0.788	0.642	0.822
Number of children age 6-11	0.697	0.816	0.663	0.798	0.891	0.887
Number of children age 12-17	0.590	0.778	0.560	0.754	0.758	0.885
Transfer income/1000	1.437	4.587	1.378	4.478	1.770	5.146
Non-transfer income/1000	0.894	3.919	0.890	3.908	0.913	3.984
Area Characteristics						
Non-MSA	0.197	0.398	0.200	0.400	0.184	0.387
Unemployment rate by county	5.249	2.943	5.247	2.936	5.261	2.982
Average weekly wage by county/100	6.142	1.584	6.142	1.601	6.144	1.487
Total Observations	47,061		39,961		7,100	

Notes: The sample refers to the 1996-2002 MEPS data where I exclude single fathers, households where at least one parent is (i) disabled or (ii) retired or (iii) a student or (iv) less than 18 years old; or (v) older than 64. A child is defined as ill if he/she has asthma, deformities, congenital anomalies, epilepsy, heart problems or cancer. A child is defined as healthy if he/she does not have any of these health conditions. Tables B1 and B2 in Appendix B define each variable and each health condition, respectively.

Table 20 – Descriptive Statistics: Sample of Fathers Aged 18-64

	Total Sample		Fathers with a Healthy Child		Fathers with an Ill Child	
Variables	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Dependent Variables						
Father's Weekly Earnings	823.8	580.8	815.6	545.1	871.4	752.5
Father's Hourly Wage	18.25	11.68	18.10	10.79	19.14	15.83
Father's Weekly Hours of Work	44.56	9.616	44.48	9.537	45.04	10.04
Father's Characteristics						
Age	37.74	0.808	37.58	0.818	38.70	0.743
Age18-24	0.043	0.203	0.047	0.211	0.021	0.145
Age 25-34	0.334	0.471	0.343	0.475	0.282	0.450
Age 35-44	0.477	0.499	0.468	0.499	0.527	0.499
Age 45-54	0.219	0.413	0.215	0.411	0.239	0.426
Age 55-64	0.030	0.170	0.031	0.172	0.025	0.155
Years of education	12.55	3.181	12.52	3.207	12.72	3.024
No high-school degree	0.222	0.416	0.226	0.418	0.199	0.399
High-school degree	0.346	0.476	0.346	0.476	0.347	0.476
Some college	0.197	0.398	0.193	0.395	0.217	0.412
College	0.235	0.424	0.235	0.424	0.237	0.425
Non-white	0.152	0.359	0.151	0.358	0.156	0.363
Hispanic	0.285	0.451	0.292	0.455	0.248	0.431
Served in the military	0.128	0.334	0.127	0.333	0.133	0.340
Household's Characteristics						
Number of children age 0-5	0.697	0.801	0.702	0.798	0.668	0.814
Number of children age 6-11	0.693	0.815	0.657	0.799	0.898	0.871
Number of children age 12-17	0.578	0.773	0.547	0.752	0.752	0.863
Transfer income/1000	0.339	2.516	0.332	2.381	0.380	3.183
Non-transfer income/1000	0.861	3.579	0.843	3.309	0.964	4.850
Area Characteristics						
Non-MSA	0.198	0.399	0.199	0.399	0.192	0.394
Unemployment rate by county	5.146	2.873	5.158	2.863	5.072	2.931
Average weekly wage by county/100	6.139	1.559	6.145	1.581	6.102	1.424
Total Observations	26,048		22,194		3,854	

Notes: The samples refer to the 1996-2002 MEPS data where I exclude single fathers, households where at least one parent is (i) disabled or (ii) retired or (iii) a student or (iv) less than 18 years old; or (v) older than 64. A child is defined as ill if he/she has asthma, deformities, congenital anomalies, epilepsy, heart problems or cancer. A child is defined as healthy if he/she does not have any of these health conditions. Tables B1 and B2 in Appendix B define each variable and each health condition, respectively.

Summary statistics for the final sample are presented in Table 19 for mothers and Table 20 for fathers. As Tables 19 and 20 show, the samples of mothers and fathers with at least one ill child are characterized by a significantly (at 1% significant level) lower proportion of Hispanic individuals than the sample of parents with healthy children, while the proportion of non-white parents is statistically the same in the two groups.[56] In addition, mothers and fathers with at least one ill child are significantly older (at 1% statistical level) and more educated than mothers with healthy children.[57]

Following Angrist (1998) and Angrist and Krueger (1999), denote by Y_{i0} what a mother would earn if she did not have an ill child and by Y_{i1} the earnings of a mother with an ill child. Since I never observe both potential outcomes, Y_{i0} and Y_{i1}, for any mother, it makes sense to focus on average effects. One possibility is the "average treatment effect," $E[Y_{i1} - Y_{i0}]$. However, mothers with an ill child have personal characteristics that differ, on average, from mothers with a healthy child.

Simply comparing the earnings of a mother with an ill child and the earnings of a mother with a healthy child is unlikely to provide a good estimate of the effect of the presence of an ill child on the earnings of the mother. The comparison by child health status is

$$E[Y_{1i} \mid D_i = 1] - E[Y_{oi} \mid D_i = 0] =$$
$$E[Y_{1i} - Y_{oi} \mid D_i = 1] + \{E[Y_{oi} \mid D_i = 1] - E[Y_{oi} \mid D_i = 0]\}.$$

where D_i is equal to 1 if the mother has a child that is ill and 0 if she does not. This equation represents the average effect of the presence of an ill child on mothers,

[56] The z-statistics for the test of equality of proportions are -1.4586 for non-white mothers, 4.8351 for Hispanic mothers, -0.9107 for non-white fathers and 5.5557 for Hispanic fathers.
[57] t-test statistics are -5.8628 and -2.5983 for mothers' age and education, respectively; and -7.9922 and -3.7653 for fathers' age and education.

$E[Y_{1i} - Y_{oi} \mid D_i = 1]$, plus a bias term attributable to the fact that the earnings of mothers with healthy children are not necessarily representative of what mothers with an ill child would have earned if they had not had the ill child. The same argument holds if I consider fathers instead of mothers.

Ideally, to examine the effect of the presence of an ill child on parents' labor market outcomes, one would like to randomly assign illnesses to children, and to compare pre- and post-illness labor market outcomes for those parents whose child received the illness and those parents whose child did not. It is clear that this is not possible, so I sample retrospectively from the cases (parents with ill children) and controls (parents with healthy children). I implement a matched case-control study by using a data matching algorithm (Cook and Campbell, 1979) that matches mothers/fathers with an ill child to mothers/fathers with a healthy child by age, education, race and ethnicity. The data matching algorithm consists of the following steps:

1. Define as ill a child who has at least one of the following conditions: asthma, deformities, congenital anomalies, epilepsy, heart problems and cancer. Define as healthy a child who does not have any of these conditions.
2. Sort the sub-sample of mothers with at least one ill child and the sub-sample of mothers with a healthy child by exogenous characteristics of the mother, specifically by age group (age 18-24, age 25-34, age 35-44, age 45-54, age 55-64), education category (no high school degree, high school degree, some college, college degree), race (white, non-white) and ethnicity (Hispanic, non-Hispanic).

3. Match the sub-sample of mothers with an ill child with the sub-sample of mothers with a healthy child by age, education, race and ethnicity: in other words, randomly select from each stratum of the sub-sample of mothers with a healthy child created in step 2 observations equal to the number of observations of the corresponding stratum of the sub-sample of mothers with an ill child.

This data matching algorithm results in the same number of mothers with an ill and healthy child for each combination of age, education, race and ethnicity. In order to study the effect of the presence of an ill child on the labor market decisions of fathers, I implement the same algorithm. As Table 21 and Table 22 show, the sample of mothers consists of a total of 3,856 mothers (1,928 with an ill child and 1,928 with a healthy child) and 16,985 observations. The sample of fathers consists of a total of 2,664 fathers (1,332 with an ill child and 1,332 with a healthy child) and 9,214 observations. Thirty-three percent of the sample of mothers has a child with asthma and 20% of mothers have a child with deformities, congenital anomalies, heart problems, epilepsy or cancer. Similar proportions occur in the sample of fathers (32% and 21%).

For the estimation of the effect of the presence of an ill child on mothers' and fathers' earnings, hourly wages and hours of work I use the matched samples just described. I drop self-employed individuals[58] and I include mothers and fathers who participate in the labor market, and have a positive number of hours worked per week and positive hourly wages.

[58] Implicit in this exclusion is the assumption that self-employed individuals would behave the same as a regular employee if I could observe their wages.

Table 21 – Descriptive Statistics of the Matched Samples

	Single Mothers and Mothers with Partners		Fathers with Partners	
Variables	Mean	Std. Dev.	Mean	Std. Dev.
Dependent Variables				
Individual in Labor Force	0.769	0.431	1.000	0.000
Weekly Earnings	516.2	374.4	851.8	634.1
Hourly Wage	13.65	8.331	18.82	12.99
Weekly Hours of Work	37.19	11.10	44.74	9.729
Mother's Characteristics				
Age	35.93	7.632	-	-
Age 18-24	0.075	0.264	-	-
Age 25-34	0.336	0.472	-	-
Age 35-44	0.459	0.498	-	-
Age 45-54	0.121	0.326	-	-
Age 55-64	0.008	0.091	-	-
Years of education	12.54	2.931	-	-
No high-school degree	0.223	0.417	-	-
High-school degree	0.340	0.474	-	-
Some college	0.237	0.425	-	-
College	0.199	0.399	-	-
Non-white	0.209	0.407	-	-
Hispanic	0.255	0.436	-	-
Served in the military	0.014	0.119	-	-
Father's Characteristics				
Age	-	-	3.837	0.766
Age 18-24	-	-	0.026	0.158
Age 25-34	-	-	0.288	0.440
Age 35-44	-	-	0.468	0.499
Age 45-54	-	-	0.193	0.395
Age 55-64	-	-	0.025	0.154
Years of education	-	-	12.73	3.070
No high-school degree	-	-	0.197	0.398
High-school degree	-	-	0.354	0.478
Some college	-	-	0.203	0.403
College	-	-	0.245	0.430
Non-white	-	-	0.153	0.360
Hispanic	-	-	0.259	0.438
Served in the military	0.089	0.284	0.131	0.338
Household's Characteristics				
Number of children age 0-5	0.643	0.808	0.678	0.806
Number of children age 6-11	0.787	0.854	0.777	0.843
Number of children age 12-17	0.663	0.817	0.659	0.819
Transfer income/1000	1.253	4.457	0.762	3.514
Non-transfer income/1000	0.881	4.006	0.890	3.603
Area Characteristics				
Non-MSA	0.184	0.387	0.188	0.391
Unemployment rate by county	5.206	2.902	5.100	2.932
Average weekly wage by county/100	6.166	1.557	6.103	1.510
Total Observations	16,985		9,214	

Table 22 – Percentages of Mothers and Fathers with at Least One Ill Child in the Matched Samples of Mothers and Fathers

	Matched Sample of Single Mothers and Mothers with Partners		Matched Sample of Mothers with Partners		Matched Sample of Single Mothers		Matched Sample of Fathers	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
At least one ill child								
Total	1,928	50.03	1,350	50.04	578	50.00	1,332	50.00
Child Age 0-5	666	17.28	450	16.68	216	18.69	444	16.67
Child Age 6-11	895	23.22	628	23.28	267	23.10	621	23.31
Child Age 12-17	778	20.19	547	20.27	231	19.98	538	20.20
At least one asthmatic Child								
Total	1284	33.32	859	31.84	425	36.76	845	31.72
Child Age 0-5	452	11.73	289	10.71	163	14.10	287	10.77
Child Age 6-11	624	16.19	416	15.42	208	17.99	411	15.43
Child Age 12-17	476	12.35	328	12.16	148	12.80	320	12.01
At least one child with "severe conditions"								
Total	773	20.06	577	21.39	196	16.96	572	21.47
Child Age 0-5	248	6.43	181	6.71	67	5.80	177	6.64
Child Age 6-11	319	8.28	243	9.01	76	6.57	240	9.01
Child Age 12-17	344	8.93	251	9.30	93	8.04	250	9.38
Total Number of Mothers/Fathers	3,854		2,698		1,156		2,664	

Notes: The matched samples are the result of the application of the data matching algorithm described in this section to the original sample. The original sample refers to the 1996-2002 MEPS data where I exclude single fathers, households where at least one parent is (i) disabled or (ii) retired or (iii) a student or (iv) less than 18 years old; or (v) older than 64. A child is defined as ill if he/she has asthma, deformities, congenital anomalies, epilepsy, heart problems or cancer. A child is defined as healthy if he/she does not have any of these health conditions. A child has a "severe condition" if he has deformities, congenital anomalies, heart problems, epilepsy or cancer. Table B1 in the Appendix defines each condition.

The last goal of this chapter is to investigate the effect of mothers' labor force participation and hours of work on the severity of their children's illness, measured by lost school days. In order to accomplish this goal, I select children in the age group 6-17, who have a mother in the matched sample of mothers just described. The total sample consists of 24,605 observations. Table 23 shows that 35% of the children have experienced lost school days; 14.6% have asthma and 8.8% have deformities, congenital anomalies, heart problems, epilepsy or cancer. More than half of the children are in the age group 6-11, and are white and non-Hispanic. About 86% have siblings and 37% are first born.

Table 23 – Descriptive Statistics of the Sample of Children

		Children of Single Mothers and Mothers with Partners		Children of Mothers with Partners		Children of Single Mothers	
Variable	Definition	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Lost school days	Dummy = 1 if the child has lost days school; 0 otherwise	0.351	0.477	0.356	0.479	0.340	0.474
asthma_c	Dummy = 1 if the child has asthma; 0 otherwise	0.146	0.353	0.137	0.344	0.170	0.375
severcond_c	Dummy = 1 if the child has deformities, congenital anomalies, heart problems, epilepsy or cancer; 0 otherwise	0.088	0.283	0.091	0.287	0.079	0.269
age 6-11	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.543	0.498	0.542	0.498	0.544	0.498
nonwhite_c	Dummy = 1 if the child is non-white; 0 otherwise	0.221	0.415	0.158	0.364	0.401	0.490
hispanic_c	Dummy = 1 if the child is non-Hispanic; 0 otherwise	0.281	0.450	0.269	0.444	0.314	0.464
firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.373	0.484	0.353	0.478	0.429	0.495
sibling	Dummy = 1 if the child has siblings; 0 otherwise	0.859	0.348	0.880	0.325	0.800	0.400
Number of Observations		24,605		18,162		6,443	

Notes: Sample of children aged 6-17 and with mothers of working age 18-64. The mothers have been selected from the matched sample of mothers described in Table 21.

3.5 Overview of the Empirical Models and Estimation Methods

In order to investigate how the health conditions of a child affect mothers' labor force participation, fathers' and mothers' earnings, hourly wages and weekly hours of work, I estimate four models that are specified as described in Section 2.4 of Chapter 2 with the following differences: (i) in this chapter individual *i* is the mother or the father; (ii) *m* indicates the father and *f* the mother; (iii) the vector of the mother's demographic characteristics $\mathbf{X_{f,t}}$ includes also a dummy variable (*single*) equal to 1 if the mother is single, 0 otherwise; (iii) the vector of health conditions $\mathbf{C_{j,t}}$ includes a dummy variable equal to 1 if there is at least one child in the household with asthma, 0 otherwise, and a dummy variable equal to 1 if there is at least one child with either deformities, congenital anomalies, heart problems, epilepsy or cancer. I also include the interactions terms between *single* and the health conditions vector $\mathbf{C_{j,t}}$ in order to identify the effect of the presence of an ill child on single mothers. I also estimate models that control for the presence of a child with asthma or with deformities, congenital anomalies, heart problems, epilepsy or cancer by age groups 0-5, 6-11, 12-17.

As in Chapter 2, the model of labor force participation is estimated by a random effects probit. The models of labor supply, earnings and wages are estimated taking into account sample selection by using Heckman's two-step estimation procedure (following Wooldridge, 1995 and 2002 p. 583), and allowing for the endogeneity of wages and hours of work by applying two-stage least squares. I use White's heteroskedastic-consistent covariance matrix modified to obtain robust estimates of variance clustered on parents.

3.5.1 Child Health Model

The last goal of this chapter is to investigate the effect of mothers' labor force participation and hours of work on their children's health. I use as a measure of health the number of lost school days. In order to accomplish this goal I estimate an equation for child's health defined as

(10)

$$S_{it} = \phi_0 + \mathbf{C_{j,it}}\boldsymbol{\varphi_1} + \mathbf{X_{c,it}}\boldsymbol{\varphi_2} + \hat{L}_{it}\phi_3 + \hat{L}_{it}\cdot\mathbf{C_{j,it}}\boldsymbol{\varphi_4} + \hat{L}_{it}\cdot \text{single}_{\mathbf{it}}\phi_5 + \hat{L}_{it}\cdot\mathbf{edu_{f,it}}\boldsymbol{\varphi_6} + \mathbf{X_{f,it}}\boldsymbol{\varphi_7} + \mathbf{X_{h,it}}\boldsymbol{\varphi_8} + \mathbf{T}\boldsymbol{\varphi_9} + \varepsilon_{it}$$

where S_{it} is a dummy variable equal to 1 if the number of lost school days by the child is greater than zero; 0 otherwise. $\mathbf{C_{j,it}}$ is a vector of two dummies equal to 1 if the child has asthma or any of the following health conditions: deformities, congenital anomalies, heart problems, epilepsy and cancer. The two dummies enter together in the equation. $\mathbf{X_{c,it}}$ is a vector of child's socio-demographic characteristics. It includes dummy variables equal to 1 if the child is in the age group 6-11, if the child is non-white, if the child is Hispanic, if the child is firstborn, and if the child has siblings, plus an interaction term between being in the age group 6-11 and being the child of a single mother.

Mothers' labor market decisions are represented by the variable $\hat{L}_{it}$. When I investigate the effect of mothers' labor force participation on the probability that a child loses days of school, $\hat{L}_{it}$ represents a mother's predicted probability of being in the labor force. I obtain $\hat{L}_{it}$ by estimating in a first step mothers' labor force participation equation. I follow the model described in Section 2.4.1 of Chapter 2 with the differences just listed above. However, when I investigate the effect of mothers' labor supply on the probability of losing days of school, then $\hat{L}_{it}$ is the predicted number of hours of work of the mother.

In this case, I obtain $\hat{L}_{it}$ by estimating in a first step the mother's labor supply equation defined as in Section 2.4.4 of Chapter 2 with the differences listed in Section 3.5.

The vector $\mathbf{X_{f,it}}$ represents the mother's socio-demographic characteristics, including education dummies ($\mathbf{edu_{f,it}}$), and whether the mother is single; $\mathbf{X_h}$ is a vector of household characteristics, such as whether the household lives in a metropolitan statistical area, and the percentage of household income from transfers and non-transfers.[59,60] Finally, the vector of dummies for the year and month of interview (**T**) also includes the recall period of the number of lost school days.

I estimate equation (10) by a random effects probit. However, I also estimate equation (10) by random effects negative binomial and random effects Poisson models, where S_{it} is the number of days of school the child has lost since the last interview round. I also test for overdispersion. The mean of the negative binomial distribution is $E(s_{it}) = \exp(\mathbf{z_{it}\beta})$ where $\mathbf{z_{it}}$ summarizes all the independent variables of equation (10) and $\boldsymbol{\beta}$ is a coefficient vector. The variance of the dependent variable is $V(s_{it}) = \exp(\mathbf{z_{it}\beta})[1+\alpha\exp(\mathbf{z_{it}\beta})]$. The parameter α can be interpreted as the overdispersion parameter. If $\alpha = 0$, no overdispersion exists, the mean is equal to the variance and the negative binomial collapses to the Poisson distribution in the limit. If $\alpha > 0$ or $\alpha < 0$ then the Poisson model is rejected in favor of the negative binomial.

[59] Transfer income includes a person's Social Security Income, alimony income, child support, public assistance, Supplemental Security Income (SSI), Individual Retirement Account (IRA) income, pension income, veteran's income, and other regular cash contributions.

[60] Non-transfer income includes a person's interest income, dividend income, sales income, trust/rent income, and refund income.

3.6 Results

3.6.1 Evidence of the Effect of Children's Chronic Health Conditions on Mothers' and Fathers' Labor Market Decisions

The first objective of this chapter is to analyze the effect of the presence of an asthmatic child on the labor market decisions of mothers and fathers, and to compare this with the effect of having a child with deformities, congenital anomalies, heart problems, epilepsy or cancer. Tables 24 and 25 present the estimated effects on mothers, and Table 26 on fathers. Estimates of the "non-health" variables are presented in Tables B3-B5 in Appendix B.[61]

As Table 24 and Table 25 show, I do not find any significant effect of having a child with asthma on a mother's labor force participation for both single mothers and mothers with partners. In addition, the marginal effects are very small. Regarding the other labor market outcomes, my results suggest that single mothers are the most affected group. I find that single mothers with an asthmatic child less than six years old work 1.44 hours per week less (in a year that is almost two full weeks) than mothers with a non-asthmatic child.[62] By comparison, the effect of having an asthmatic child less than six years old on the hours of work of a single mother is equivalent to having one more child without asthma less than six years old. I also find that while asthmatic children do not affect the productivity of mothers (i.e., earnings and hourly wages) and their labor force participation, single mothers with a child with deformities, congenital anomalies, heart

[61] Tables B10 – B15 in Appendix B present the results first by using the non-matched samples, and then, by using the sample with oversampling of low-income, which includes all the MEPS panels (years 1996-2004).

[62] I estimate the labor supply equation also for the sub-samples of mothers with a child's father who works 40 hours per week, less and more than 40 hours per week. The estimated coefficients are presented in Table B6 in Appendix B. I find that mothers with a child's father who works less than 40 hour per week and with an asthmatic child or a child with a severe health condition work significantly fewer hours per week than mothers with a healthy child.

problems, epilepsy or cancer who is less than six years old earn about 24.8% less than single mothers and 29.8% less than mothers with partners who do not have a child with any of these health conditions. In addition, single mothers with a child with deformities, congenital anomalies, heart problems, epilepsy or cancer and in school age (age group 6-11) are 4.3% more likely to work or to be looking for a job.

In addition, as Table 26 shows, while single mothers with an asthmatic child less than six years old work fewer hours per week, fathers work 1.18 hours more per week (significant at the 1% level); that is, 59 hours more per year.[63] I also find that the presence of an asthmatic child reduces the hourly wages of fathers by 2.3% and by about 5% if the asthmatic child is less than six years old. To illustrate, the hourly wage of a white father with an asthmatic child is equivalent to that of a non-white father with a healthy child. My results also suggest that the presence of a child with deformities, congenital anomalies, heart problems, epilepsy or cancer does not significantly affect fathers' labor market decisions, with the exception of an unexpected increase in their weekly earnings if the child is between 12 and 17.

My results are consistent with those of Feng and Reagan (2004), who find no significant effects of an asthmatic child on the labor market decisions of married mothers, and a negative effect on the hours of work of single mothers. However, they also find a moderate negative effect of having an asthmatic child on the labor force participation of single mothers in four out of eight survey years.[64]

[63] I estimate the labor supply equation also for the sub-samples of fathers with a child's whose mother works 40 hours per week, and less (more) than 40 hours per week. The estimated coefficients are presented in Table B7 in Appendix B. I find that if the mother works 40 hours per week then fathers with an asthmatic child less than six years old work 2.14 hours more than fathers with a healthy child.

[64] In addition, Corman et al. (2005a and 2005b) find that having a young child in poor health reduces mothers' probability of working, their hours of work and the hours of work of fathers. However, they focus on the low end of the socioeconomic spectrum and on fragile families.

Table 24 – Effects of Having an Asthmatic Child on Mothers' Labor Market Decisions

Mothers	*Dependent Variables*									
	Labor Force Participation[a]				**Log Weekly Earnings[b]**		**Weekly Hours of Work[c]**		**Log Hourly Wages[d]**	
	Model 1		Model 2		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Independent Variables	Coeff.	Marg. Eff.	Coeff.	Marg. Eff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Asthmatic Child	-0.0062	-0.0002			0.0106		0.2588		-0.0208	
	(0.1099)				(0.0318)		(0.5236)		(0.0223)	
Asthmatic Child Age 0-5			-0.0168	-0.0007		0.0160		1.0285		-0.0200
			(0.1618)			(0.0505)		(0.9517)		(0.0371)
Asthmatic Child Age 6-11			0.1135	0.0044		0.0123		0.0597		-0.0080
			(0.1467)			(0.0478)		(0.7672)		(0.0306)
Asthmatic Child Age 12-17			-0.1277	-0.0052		-0.0033		-0.2018		-0.0257
			(0.1837)			(0.0454)		(0.7375)		(0.0314)
Single*Asthmatic Child	0.1009	0.0057			-0.0258		-0.7066		-0.0042	
	(0.2112)				(0.0494)		(0.8339)		(0.0353)	
Single*Asthmatic Child Age 0-5			0.2708	0.0154		-0.0660		-2.4686*		0.0641
			(0.2996)			(0.0819)		(1.4048)		(0.0597)
Single*Asthmatic Child Age 6-11			-0.1230	-0.0050		0.0081		0.3767		-0.0467
			(0.2698)			(0.0628)		(1.0869)		(0.0446)
Single*Asthmatic Child Age 12-17			-0.0640	-0.0067		0.0110		-0.7196		0.0435
			(0.3625)			(0.0758)		(1.2030)		(0.0567)
Number of Observations	16,975		16,975		10,466	10,466	10,466	10,466	10,466	10,466

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with any of the following health conditions: deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables for the child health conditions by age group. The sample is the matched sample of mothers aged 18-64 described in Section 3.4. Robust standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Each model has been estimated by a random effects probit. Marginal effects (*Marg. Eff.*) are for a discrete change of the dummy variables from 0 to 1, and they have been calculated for the average mother in the sample (i.e., 35 years old, white, non-Hispanic, and with a high school degree). The coefficients of the control variables are presented in Table B3 in Appendix B.

[b, c, d] The coefficients of the other control variables are presented in Table B4 and Table B5 in Appendix B.

Table 25 – Effects of Having a Child with a Severe Chronic Health Condition on Mothers' Labor Market Decisions

Mothers	*Dependent Variables*									
	Labor Force Participation[a]				**Log Weekly Earnings[b]**		**Weekly Hours of Work[c]**		**Log Hourly Wages[d]**	
	Model 1		Model 2		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Independent Variables	Coeff.	Marg. Eff.	Coeff.	Marg. Eff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Child_Severe Health Condition	-0.2033	-0.0084			0.0503		-0.1797		0.0176	
	(0.1300)				(0.0394)		(0.6748)		(0.0270)	
Child_Severe Health Condition Age 0-5			-0.3220	-0.0135		0.1185*		1.3775		-0.0080
			(0.1988)			(0.0634)		(0.9959)		(0.0517)
Child_Severe Health Condition Age 6-11			-0.2862	-0.0119		0.0884		-0.9861		0.1015**
			(0.1944)			(0.0632)		(1.1230)		(0.0408)
Child_Severe Health Condition Age 12-17			0.1618	0.0062		-0.0024		-0.3243		-0.0203
			(0.2060)			(0.0546)		(1.0405)		(0.0376)
Single*Child_Severe Health Condition	0.2328	0.0101			-0.1059		-0.5085		-0.0710	
	(0.2890)				(0.0665)		(1.0392)		(0.0512)	
Single*Child_Severe Health Condition Age 0-5			0.4515	0.0211		-0.2853**		-2.5405		-0.1395
			(0.4247)			(0.1360)		(1.6409)		(0.1286)
Single*Child_Severe Health Condition Age 6-11			1.0930**	0.0552		-0.1573		-1.0146		-0.0764
			(0.5363)			(0.0991)		(1.7015)		(0.0654)
Single*Child_Severe Health Condition Age 12-17			-0.3420	-0.0173		-0.0201		0.1041		-0.0198
			(0.4492)			(0.0916)		(1.5100)		0.0688)
Number of Observations	16,975		16,975		10,466	10,466	10,466	10,466	10,466	10,466

Notes: A child has a "severe health condition" if he has deformities, congenital anomalies, heart problems, epilepsy or cancer. Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with a severe health condition. Model 2 includes dummy variables for the child health conditions by age group. The sample is the matched sample of mothers aged 18-64 described in Section 3.4. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Each model has been estimated by a random effects probit. Marginal effects (*Marg. Eff.*) are for a discrete change of the dummy variables from 0 to 1, and they have been calculated for the average mother in the sample (i.e., 35 years old, white, non-Hispanic, and with a high school degree). The coefficients of the control variables are presented in Table B3 in Appendix B. Robust standard errors are in parentheses.

[b, c, d] The coefficients of the other control variables are presented in Table B4 and B5 in Appendix B. Robust standard errors clustered on mothers are in parentheses.

Table 26 – Effects of Having a Child with Asthma or a Severe Chronic Health Condition on Fathers' Labor Market Decisions

Fathers	*Dependent Variables*					
	Log Weekly Earnings		**Weekly Hours of Work**		**Log Hourly Wages**	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Independent Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Asthmatic Child	0.0013		0.4923*		-0.0232*	
	(0.0105)		(0.2947)		(0.0137)	
Asthmatic Child Age 0-5		-0.0020		1.1774***		-0.0490*
		(0.0208)		(0.4503)		(0.0289)
Asthmatic Child Age 6-11		0.0184		0.0378		0.0149
		(0.0150)		(0.4284)		(0.0133)
Asthmatic Child Age 12-17		-0.0058		0.0206		-0.0093
		(0.0137)		(0.4389)		(0.0101)
Child_Severe Health Condition	0.0130		0.4198		-0.0091	
	(0.0141)		(0.3335)		(0.0167)	
Child_Severe Health Condition Age 0-5		0.0026		0.0061		0.0058
		(0.0166)		(0.3546)		(0.0173)
Child_Severe Health Condition Age 6-11		-0.0214		0.6383		-0.0426
		(0.0252)		(0.5279)		(0.0259)
Child_Severe Health Condition Age 12-17		0.0467**		0.4350		0.0182
		(0.0217)		(0.4520)		(0.0231)
Number of Observations	9,211	9,211	9,211	9,211	9,211	9,211

Notes: A child has a "severe health condition" if he has deformities, congenital anomalies, heart problems, epilepsy or cancer. Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with a severe health condition.. Model 2 includes dummy variables for the child health conditions by age group. The sample is the matched sample of fathers with partners aged 18-64 described in Section 3.4. Robust standard errors clustered on fathers are in parentheses.* Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a, b, c] The coefficients of the other control variables are presented in Table B8 and Table B9 in Appendix B.

3.6.2 Evidence of the Effect of Mothers' Labor Market Decisions on Children's Health

How do mothers' labor market decisions affect their children's health? Table 27 shows the estimated coefficients of equation (10) where the dependent variable is a dummy equal to 1 if the child experiences lost school days, and 0 otherwise.[65] I estimated a random effects probit model.[66] Tables 28 and 29 present predictions of the probability of missing days of school for asthmatic children and children with deformities, congenital anomalies, heart problems, epilepsy or cancer by mother's education level, race and employment status.

I find that if the mother participates in the labor market, a child is more likely to lose days of school than if the mother does not participate. The effect is larger for children whose mother has a college degree than a high school degree, and for children with a single mother. To illustrate, consider the average child in the sample, who is white, in the age group 6-11, non-Hispanic, and has siblings. As Box A of Table 28 shows, the asthmatic child of a mother with a college degree who is living with a partner is 23% more likely to miss days of school if the mother works than if she does not work. If the mother has a high school degree (Box B), the likelihood that the child loses days of school is about 10%. It should, however, be noted that this effect is the same for non-asthmatic children. In Table 28 the marginal effect of labor force participation is greater for an asthmatic child than for a healthy child because

[65] Tables B16-B19 in Appendix B present the estimated coefficients for the sample with oversampling of low income people (years 1996-2004), and the non-matched sample.

[66] However, I also estimated equation (10) by random effects negative binomial and random effects Poisson models. I reject the Poisson model in favor of the negative binomial model. The overdispersion parameter α is significant at the 1% level (α = 1.8035). The estimated coefficients and predicted number of days of school lost are presented in Tables B20-B22 in Appendix B.

the $\mathbf{Z_{it}}\hat{\boldsymbol{\beta}}$ at which the effect is being evaluated for the asthmatic child is higher than the $\mathbf{Z_{it}}\hat{\boldsymbol{\beta}}$ for a healthy child.[67] In contrast, if I consider an asthmatic child with a single mother and a high school degree (Box D), the child is about 18% more likely to experience lost school days if the mother works than if she does not. However, the largest effect is associated with having a single mother with a college degree (Box C). The likelihood that the child loses days of school is about 31% if she works than if she does not work.[68]

Table 29 presents the effects of mothers' labor market decisions on the likelihood of a child with deformities, congenital anomalies, heart problems, epilepsy or cancer losing days of school. In contrast with the previous results, I find that a child with any of the aforementioned health conditions whose mother has a high school degree is less likely to lose days of school if his/her mother works than if she does not work (Box B: -16% if mothers with partners; Box D: -3.5% if single mothers). However, the effect is positive if the mother has a college degree. If the mother is single and has a college degree, then a child with deformities, congenital anomalies, heart problems, epilepsy or cancer is about 10% more likely to lose days of school. This effect is equivalent to the effect experienced by an asthmatic with a mother with a high school degree who is living with a partner.

[67] $\mathbf{Z_{it}}$ summarizes the independent variables of equation (10) and $\hat{\boldsymbol{\beta}}$ is the vector of estimated coefficients.

[68] This result might be explained by the fact that a single mother with college degree could afford a caregiver.

Table 27 – Mothers' Labor Force Participation and School Days Lost

(Random Effects Probit)

Independent Variable	Definition of Independent Variable[a]	Coefficients
	Child's Characteristics	
Asthma	Dummy = 1 if the child has asthma; 0 otherwise	0.5630***
		(2.76)
Severecond	Dummy = 1 if the child has deformities, congenital anomalies, heart problems, epilepsy or cancer; 0 otherwise	1.0005***
		(4.16)
age611	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.1336***
		(4.71)
age611single	*age611**Single mother	-0.0512
		(0.95)
Nonwhite	Dummy = 1 if the child is non-white; 0 otherwise	-0.3777***
		(11.65)
Hispanic	Dummy = 1 if the child is non-Hispanic; 0 otherwise	-0.1589***
		(4.97)
Firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.0319
		(1.04)
Sibling	Dummy = 1 if the child has siblings; 0 otherwise	-0.1281***
		(3.12)
	Mother's Characteristics	
part_f	Predicted probability of mothers' labor force participation	0.4903***
		(4.67)
Asthmapart_f	*asthma*part_f*	-0.0353
		(0.17)
severecondpart_f	*severecond*part_f*	-0.6796***
		(2.71)
Single	Dummy = 1 if the mother is single; 0 otherwise	-0.2071
		(0.70)
partsingle_f	*part_f*single*	0.2340
		(0.80)
highsch_f	Dummy = 1 if the mother has a high-school degree; 0 otherwise	0.1529
		(0.55)
somecoll_f	Dummy = 1 if the mother has some college; 0 otherwise	1.4162**
		(2.35)
college_f	Dummy = 1 if the mother has a college degree; 0 otherwise	-0.1666
		(0.19)
highschpart_f	*highsch_f *part_f*	-0.1497
		(0.52)
somecollpart_f	*somecoll_f*part_f*	-1.3350**
		(2.20)
collpart_f	*college_f*part_f*	0.2430
		(0.28)
Constant	Constant	-1.0106***
		(9.45)
Number of Observations		23,847

Notes: I use the sample of children with mothers aged 18-64 described in Section 3.4. The ratio of the coefficient to its standard error is in parentheses. Other covariates include the percentage of household income from transfers and non-transfers; if the child lives in a non-metropolitan statistical area; dummy variables for the year and month of interview, and the recall period of the number of lost school days.

[a] The dependent variable is a dummy = 1 if the child has lost days of school; 0 otherwise.

* Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table 28 – Mothers' Labor Force Participation, Asthmatic Children and Predicted Probabilities of School Days Lost (Random Effects Probit)

(A) Mothers with Partners and with College Degree				**(B) Mothers with Partners and with High-School Degree**			
White Children				*White Children*			
	P	NP	*(P-NP)*		P	NP	*(P-NP)*
NA	0.4515	0.2687	*0.1829*	NA	0.4269	0.3175	*0.1094*
A	0.6286	0.3947	*0.2340*	A	0.6048	0.5021	*0.1027*
(A-NA)	*0.1771*	*0.1260*		*(A-NA)*	*0.1779*	*0.1847*	
Non-white Children				*Non-white Children*			
	P	NP	*(P-NP)*		P	NP	*(P-NP)*
NA	0.3285	0.1739	*0.1547*	NA	0.3063	0.2127	*0.0935*
A	0.5024	0.2778	*0.2246*	A	0.4775	0.3757	*0.1018*
(A-NA)	*0.1739*	*0.1040*		*(A-NA)*	*0.1713*	*0.1630*	
(C) Single Mothers with College Degree				**(D) Single Mothers with High-School Degree**			
White Children				*White Children*			
	P	NP	*(P-NP)*		P	NP	*(P-NP)*
NA	0.4433	0.1666	*0.2767*	NA	0.4188	0.2435	*0.1753*
A	0.6208	0.3130	*0.3078*	A	0.5968	0.4149	*0.1819*
(A-NA)	*0.1775*	*0.1464*		*(A-NA)*	*0.1780*	*0.1714*	
Non-white Children				*Non-white Children*			
	P	NP	*(P-NP)*		P	NP	*(P-NP)*
NA	0.3211	0.0986	*0.2225*	NA	0.2990	0.1545	*0.1445*
A	0.4942	0.2091	*0.2851*	A	0.4693	0.2956	*0.1737*
(A-NA)	*0.1731*	*0.1105*		*(A-NA)*	*0.1703*	*0.1411*	

Notes: Predicted probabilities have been calculated for a child in the age group 6-11, non-Hispanic, with siblings. I used the coefficients of the random effects probit presented in Table 27.

P = Mothers participate in the labor force.
NP = Mothers do not participate in the labor force.
A = Child has asthma.
NA = Child does not have asthma.

For example, [NA, NP] is the predicted probability of school days lost of a child without asthma with a mother that does not participate in the labor force. *(A-NA)* indicates the difference in the probability of losing days of school between an asthmatic child and a non-asthmatic child. *(P-NP)* indicates the difference in the probability of losing days of school between a child whose mother participates in the labor force and a child whose mother does not participate in the labor force.

Table 29 – Mothers' Labor Force Participation, Severely Ill Children and Predicted Probabilities of School Days Lost (Random Effects Probit)

(SV) Mothers with Partners with College Degree				**(B) Mothers with Partners with High-School Degree**			
White Children				*White Children*			
	P	NP	*(P-NP)*		P	NP	*(P-NP)*
NSV	0.4515	0.2687	*0.1829*	NSV	0.4269	0.3175	*0.1094*
SV	0.5604	0.5422	*0.0181*	SV	0.5356	0.7003	*-0.1646*
(SV-NSV)	*0.1088*	*0.2736*		*(SV-NSV)*	*0.1087*	*0.3828*	
Non-white Children				*Non-white Children*			
	P	NP	*(P-NP)*		P	NP	*(P-NP)*
NSV	0.3285	0.1739	*0.1547*	NSV	0.3063	0.2127	*0.0935*
SV	0.4324	0.4145	*0.0179*	SV	0.4080	0.5225	*-0.1145*
(SV-NSV)	*0.1039*	*0.2406*		*(SV-NSV)*	*0.1017*	*0.3098*	
(C) Single Mothers with College Degree				**(D) Single Mothers with High-School Degree**			
White Children				*White Children*			
	P	NP	*(P-NP)*		P	NP	*(P-NP)*
NSV	0.4433	0.1666	*0.2767*	NSV	0.4188	0.2435	*0.1753*
SV	0.5522	0.4545	*0.0976*	SV	0.5274	0.5629	*-0.0355*
(SV-NSV)	*0.1089*	*0.2879*		*(SV-NSV)*	*0.1086*	*0.3194*	
Non-white Children				*Non-white Children*			
	P	NP	*(P-NP)*		P	NP	*(P-NP)*
NSV	0.3211	0.0986	*0.2225*	NSV	0.2990	0.1545	*0.1445*
SV	0.4243	0.3313	*0.0930*	SV	0.4000	0.4349	*-0.0349*
(SV-NSV)	*0.1032*	*0.2327*		*(SV-NSV)*	*0.1009*	*0.2804*	

Notes: Predicted probabilities have been calculated for a child in the age group 6-11, non-Hispanic, with siblings. I used the coefficients of the random effects probit presented in Table 27.

P = Mothers participate in the labor force.
NP = Mothers do not participate in the labor force.
SV = Child has a severe condition, such as deformities, congenital anomalies, heart problems, epilepsy, cancer.
NSV = Child does not have a severe health condition.

For example, [NA, NP] is the predicted probability of school days lost of a child without asthma with a mother that does not participate in the labor force. (SV-NSV) indicates the difference in the probability of losing days of school between a child with a severe health condition and a child without severe health conditions. (P-NP) indicates the difference in the probability of losing days of school between a child whose mother participates in the labor force and a child whose mother does not participate in the labor force.

Finally, I consider only working mothers and I investigate the effect of mothers' weekly hours of work on the probability of a child of experiencing school days lost. Table 30 shows the estimated coefficients.[69] I find a very small and insignificant effect of mother's hours of work on the probability that a child misses school. This effect is independent of a child's health status. As Boxes B and D of Table 31 and Table 32 show, the most affected group consists of non-white children with a mother with a high school degree. This finding is for example consistent with the result by Blau et al. (1996), who find little evidence that maternal labor supply has a direct effect on child health.

3.7 Conclusions

In this chapter I have first focused on the effect of a child's asthma, a serious chronic disease in children in the U.S., on mothers' and fathers' labor market decisions. Then, I have explored how a mother's labor force participation and hours of work in turn affect the health of the asthmatic child measured by the number of lost school days. I have compared these effects to the effects of a set of chronic health conditions that includes deformities, congenital anomalies, heart problems, epilepsy, and cancer.

I do not find any significant effect of having a child with asthma on a mother's labor force participation for both single mothers and mothers with partners. However, I find that if the mother participates in the labor market, a child is more

[69] I also estimated equation (10) using random effects negative binomial and random effects Poisson models. I reject the Poisson model in favor of the negative binomial model. The overdispersion parameter α is significant at the 1% level (α = 1.8691). The estimated coefficients and predicted number of days of school lost are presented in Tables B23-B25 in Appendix B.

likely to lose days of school than if the mother does not participate. This effect holds equally for asthmatic children and for children without a serious chronic health condition. The effect is larger for children whose mother has a college degree than a high school degree, and for children with a single mother.

In contrast, I find that single mothers with a child with deformities, congenital anomalies, heart problems, epilepsy or cancer and of school age (age group 6-11) are more likely to work or to be looking for a job. However, my results suggest that if the mother works, then a child with deformities, congenital anomalies, heart problems, epilepsy or cancer is less likely to experience lost school days than if the mother does not work.

Among the chronic health conditions asthma is unique for the fact that it is unpredictable in its manifestations, with symptoms that are episodic and require immediate interventions. However, if correctly managed, a child can achieve normal quality of life (WHO, 2007). In contrast, health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer are less unpredictable in their manifestations than asthma. In addition, maternal employment has been showed to positively impact children's health through an increase in household income (Case et al., 2002 and Currie and Lin, 2007). More income allows mothers to invest more in the health care of their seriously ill child, and to acquire and improve the health insurance coverage. These results should not be interpreted as indicating that the family is better off if the mother participates in the labor force neither that the impacts on lost school days are the only relevant welfare effect.

My results also suggest that single mothers are the most affected group. To illustrate, the effect of having an asthmatic child less than six years old on the hours of work of a single mother is equivalent to having one more child without asthma less than six years old. I also find that while asthmatic children do not affect the productivity of mothers and their labor force participation, single mothers with a child with deformities, congenital anomalies, heart problems, epilepsy or cancer and less than six years old earn about 24.8% and 29.8% less than single mothers and mothers with partners without a child with any of these health conditions, respectively.

Finally, I have contributed more generally to the very limited literature on the determinants of paternal labor supply. In contrast with the finding that single mothers with an asthmatic child less than six years old work less hours per week, fathers with partners work 59 hours more per year. The father may work more to compensate for the greater financial and time costs of raising the child.

These findings are of importance in informing national health policies, for which it is often necessary to examine the effects of health improvements, and more generally, in designing social programs. Greater understanding of how different chronic health conditions impact parents' employment and how in turn parents' market labor decisions impact children's health will lead to more effective public policies. Policymakers need to create welfare policies for families with chronically ill children that will help them to work and improve family well-being without jeopardizing their children's health. As this study shows, particular attention should be given to single mothers, and working mothers with asthmatic children.

Table 30 – Mothers' Weekly Hours of Work and School Days Lost

Independent Variable	Definition of Independent Variable	**Random Effects Probit**[a] Coefficients
	Child's Characteristics	
asthma	Dummy = 1 if the child has asthma; 0 otherwise	0.1094
		(0.14)
severecond	Dummy = 1 if the child has deformities, congenital anomalies, heart problems, epilepsy or cancer; 0 otherwise	-0.2854
		(0.32)
age611	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.1571***
		(4.03)
age611single	*age611**Single mother	-0.0929
		(1.39)
nonwhite	Dummy = 1 if the child is non-white; 0 otherwise	-0.3733***
		(8.98)
hispanic	Dummy = 1 if the child is non-Hispanic; 0 otherwise	-0.0895**
		(2.09)
firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.0544
		(1.36)
sibling	Dummy = 1 if the child has siblings; 0 otherwise	-0.0780
		(1.59)
	Mothers' Characteristics	
hour_f	Mothers' predicted number of hours of work per week	0.0404**
		(2.35)
asthmahour_f	*asthma*hour_f*	0.0112
		(0.55)
severecondhour_f	*severecond*hour_f*	0.0163
		(0.67)
single	Dummy = 1 if the mother is single; 0 otherwise	0.1638
		(0.23)
hoursingle_f	*hour_f*single*	-0.0053
		(0.29)
highsch_f	Dummy = 1 if the mother has a high-school degree; 0 otherwise	-0.0299
		(0.04)
somecoll_f	Dummy = 1 if the mother has some college; 0 otherwise	2.3744***
		(3.11)
college_f	Dummy = 1 if the mother has a college degree; 0 otherwise	1.4886*
		(1.82)
highschhour_f	*highsch_f *hour_f*	0.0051
		(0.26)
somecollhour_f	*somecoll_f*hour_f*	-0.0579***
		(2.80)
collhour_f	*college_f*hour_f*	-0.0347
		(1.56)
Constant	Constant	-2.2459***
		(3.62)
Number of Observations		14,661

Notes: I use the sample of children with mothers aged 18-64 described in Section 3.4. The ratio of the coefficient to its standard errors is in parentheses. Other covariates include the percentage of household income from transfers and non-transfers; if the child lives in a non-metropolitan statistical area; dummy variables for the year and month of interview, and the recall period of the number of lost school days.

[a] The dependent variable is a dummy = 1 if the child has lost days of school; 0 otherwise.

* Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table 31 – Mothers' Hours of Work, Asthmatic Children and Predicted Probabilities of School Days Lost (Random Effects Probit)

(A) Mothers with Partners with College Degree				(B) Mothers with Partners with High-School Degree			
White Children				*White Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NA	0.8431	0.8723	-0.0292	NA	0.8406	0.8310	0.0096
A	0.9284	0.9264	0.0020	A	0.9270	0.9200	0.0070
(A-NA)	0.0853	0.0541		(A-NA)	0.0864	0.0891	
Non-white Children				*Non-white Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NA	0.7544	0.7934	-0.0391	NA	0.7511	0.7386	0.0125
A	0.8739	0.8709	0.0030	A	0.8718	0.8613	0.0104
(A-NA)	0.1195	0.0775		(A-NA)	0.1207	0.1227	
(C) Single Mothers with College Degree				**(D) Single Mothers with High-School Degree**			
White Children				*White Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NA	0.8153	0.8152	0.0001	NA	0.8126	0.8032	0.0094
A	0.9122	0.9106	0.0016	A	0.9106	0.9032	0.0073
(A-NA)	0.0969	0.0954		(A-NA)	0.0980	0.1001	
Non-white Children				*Non-white Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NA	0.7187	0.7185	0.0001	NA	0.7152	0.7034	0.0118
A	0.8498	0.8475	0.0023	A	0.8474	0.8368	0.0106
(A-NA)	0.1312	0.1289		(A-NA)	0.1322	0.1334	

Notes: Predicted probabilities of school days lost have been calculated for a child in the age group 6-11, non-Hispanic, with siblings. I used the coefficients of the random effects probit presented in Table 30.

L = Mother's number of hours of work per week.
L+1 = Increase of one hour of work per week.
A = Child has asthma.
NA = Child does not have asthma.

For example, [NA, L] is the predicted probability of lost school days by a child without asthma and with a mother that works about 37 hours per week. Marginal effect indicates the effect of one additional hour of work per week of the mother on the number of lost school days by the child. It is the difference between (L+1) and L. (A-NA) indicates if a child with asthma is more or less likely to lose days of school with to respect a child without asthma.

Table 32 – Mothers' Hours of Work, Severely Ill Children and Predicted Probabilities of School Days Lost (Random Effects Probit)

(A) Mothers with Partners and with College Degree				**(B) Mothers with Partners and with High-School Degree**			
White Children				*White Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NSV	0.8431	0.8723	-0.0292	NSV	0.8406	0.8310	0.0096
SV	0.9018	0.8985	0.0033	SV	0.9000	0.8904	0.0096
(SV-NSV)	0.0587	0.0262		(SV-NSV)	0.0594	0.0594	
Non-white Children				*Non-white Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NSV	0.7544	0.7934	-0.0391	NSV	0.7511	0.7386	0.0125
SV	0.8347	0.8300	0.0047	SV	0.8321	0.8185	0.0136
(SV-NSV)	0.0803	0.0365		(SV-NSV)	0.0810	0.0799	
(C) Single Mothers with College Degree				**(D) Single Mothers with High-School Degree**			
White Children				*White Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NSV	0.8153	0.8152	0.0001	NSV	0.8126	0.8032	0.0094
SV	0.8814	0.8786	0.0029	SV	0.8794	0.8694	0.0100
(SV-NSV)	0.0661	0.0633		(SV-NSV)	0.0668	0.0662	
Non-white Children				*Non-white Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NSV	0.7187	0.7185	0.0001	NSV	0.7152	0.7034	0.0118
SV	0.8060	0.8021	0.0040	SV	0.8032	0.7895	0.0137
(SV-NSV)	0.0874	0.0835		(SV-NSV)	0.0880	0.0861	

Notes: Predicted probabilities of school days lost have been calculated for a child in the age group 6-11, non-Hispanic, with siblings. I used the coefficients of the random effects probit presented in Table 30.

L = Mothers' average number of hours per week.
L+1 = Increase of one hour of work per week.
SV = Child has a severe condition, such as deformities, congenital anomalies, heart problems, epilepsy, cancer.
NSV = Child does not have a severe health condition.

For example, [NSV, L] is the predicted probability of lost school days by a child with a severe health condition and with a mother that works about 37 hours per week. Marginal effect indicates the effect of one additional hour of work per week of the mother on the number of lost school days by the child. It is the difference between (L+1) and L. (SV-NSV) indicates if a child with a severe health condition is more or less likely to lose days of school with respect to a child without a severe health condition.

Chapter 4: Conclusions

The main goal of this research has been to show how specific adults' and children's health conditions potentially linked to environmental pollution exposure affect the labor market decisions of households in the United States.

In my dissertation I have considered three ways in which health affects the labor market decisions of households in the United States: one, the direct effect of a married woman or married man's health on their own labor market outcomes; two, the influence of a spouse's health conditions on the other spouse's labor market decisions; and three, the impact of a child's chronic health condition on parents' labor market outcomes. Finally, I have also explored how the labor market decisions of parents may affect the number of days their children miss school due to illness. I have focused on four labor market outcomes: labor force participation, weekly earnings, hourly wages and weekly hours of work, using data from the 1996-2002 Medical Expenditure Panel Survey of U.S.

In particular, in Chapter 2 I have estimated the effect of a married man and woman health condition's on their own and their spouse's labor market decisions. The effects differ by health condition and duration of the disease. With the exceptions of chronic bronchitis and COPD, all the health conditions examined significantly reduce the probability that a married man participates in the labor force. The effect of a married woman's health condition on her labor force participation, even if statistically significant, is very small. Among married men who are working, having had emphysema for less than one year is enough to reduce the earnings of a man with a college degree to those of a healthy man without high school diploma. My results

also suggest that if a man has had cancer, his wife may have to compensate for the ensuing loss in household income by working more hours or entering the labor force.

In Chapter 3 I have investigated how the presence of an asthmatic child or a child with deformities, congenital anomalies, heart problems, epilepsy or cancer affects parents' labor market decisions, and in turn, how mothers' decisions to work or how much to work affect the health of the chronically ill child, measured by the number of school days lost. I have found that single mothers with a chronically ill child are the most affected group in terms of hours of work lost and reduction in earnings. My results also suggest that maternal employment is associated with a higher probability of a child missing school, and that this effect is the same for healthy children as for asthmatic children. In addition, consistent with previous research (Case et al., 2002 and Currie and Lin, 2007), maternal employment has been showed to positively impact the health of children with deformities, congenital anomalies, heart problems, epilepsy or cancer, in the sense of being negatively associated with lost school days.

Finally, I have contributed more generally to the very limited literature on the determinants of paternal labor supply. I have found that fathers with an asthmatic child less than six years old work more hours per week, possibly to compensate for the greater financial and time costs of raising the child.

These findings are of importance in informing national health policies, for which it is often necessary to examine the effects of reducing cases of heart disease, respiratory illness and cancer; and more generally, in designing social programs. Greater understanding of how different chronic health conditions impact parents'

employment and how in turn parents' market labor decisions impact children's health will lead to more effective public policies. In particular, single mothers with chronically ill children face challenges in complying with work requirements, and they may need additional assistance such as subsidized child care that will help them work without jeopardizing their children's health.

Appendix A –Auxiliary Tables for Chapter 2

Table A1 – Definition of Married Men and Women's Health Conditions

Chronic condition	ICD-9 Code	Definition
Arthritis	711	arthropathy associated with infections
	730	osteomyelitis, periostitis, and other infections involving bone
Asthma	493	asthma
Back problems	720-724;847	dorsopathies; sprains and strains of other parts of back
Cancer	140-149; 160; 230	cancer of head and neck
	150-151; 230	cancer of esophagus; of stomach
	153-154; 159	cancer of colon; of rectum and anus
	155	cancer of liver and intrahepatic bile duct
	157	cancer of pancreas
	152; 156; 158-159;162	cancer of other GI organs, peritoneum
	162; 231	cancer of bronchus, lung
	162-163;165	cancer, other respiratory and intrathoracic organs
	170-171	cancer of bone and connective tissue
	172	melanomas of skin
	173; 232	other non-epithelial cancer of skin
	174-175;233	cancer of breast
	179-180; 182; 233; 795	cancer of uterus; of cervix
	027	cancer of ovary
	181;183-184	cancer of other female genital organ
	185-186;233	cancer of prostate; of testis
	188-189	cancer of bladder; of kidney and renal pelvis
	191-192	cancer of brain and nervous system
	193	cancer of thyroid
	201	hodgkin's disease
	200;202	non-hodgkin's lymphoma
	202-208	leukemias
	203	multiple myeloma
	164;190;194-195;234;795;	cancer, other and unspecified primary
	196-198	secondary malignancies
	199	malignant neoplasm without specification of site
	235-239	neoplasms of unspecified nature or uncertain behavior
COPD	491	chronic bronchitis
	492	emphysema
Chronic bronchitis	491	chronic bronchitis
Emphysema	492	emphysema
Ischemic heart disease	410	acute myocardial infarct
	411-413	Other acute and subacute forms of ischemic heart disease; old myocardial infarcì; angina pectoris
	414	other forms of chronic ischemic heart disease
Mental illness	319	mental retardation
	291;303;305	alcohol-related mental disorders
	292;304;305	substance-related mental disorders
	290; 293-294; 310;331	senility and organic mental disorders
	296;300;301	affective psychoses; neurotic disorders; personality disorders)
	295; 297-299	schizophrenia and related disorders; other psychoses
	300;301;307;308;312	anxiety; somatoform; dissociative; and personality disorders
	300;302;306-307;309;311; 313;315-316	other mental conditions
	308;312	acute reaction to stress; disturbance of conduct
	290; 293-294	dementias; transient organic psychotic conditions
	300; 309	neurotic disorders; Adjustment reaction
	310	specific nonpsychotic mental disorders following brain damage
	331	other cerebral degenerations
	797	senility without mention of psychosis
Stroke	430	subarachnoid hemorrhage
	432	other and unspecified intracranial hemorrhage
	433-435	precerebral occlusion; occlusion of cerebral arteries; transient cerebral ischemia
	436	acute but ill-defined cerebrovascular disease
	437	other and ill-defined cerebrovascular disease
	438	late effects of cerebrovascular disease

Table A2 – Variables Definition

Variable name	Definition
Individual i's Health Conditions	
Health condition *j*	Dummy =1 if individual *i* has or has had health condition *j*; 0 otherwise (*j* = cancer, severe cancer, stroke, ischemic heart disease, emphysema, chronic bronchitis, COPD, asthma)
Duration_health condition	Number of years that the individual has had the health condition
Duration^2_health condition	Duration of the health condition squared
Missing duration health condition	Dummy = 1 if duration of the health condition is missing; 0 otherwise
Arthritis	Dummy =1 if individual *i* has arthritis; 0 otherwise
Back	Dummy =1 if individual *i* has back problems; 0 otherwise
Mental	Dummy =1 if individual *i* has mental illness; 0 otherwise
Husband's Characteristics	
Age	Age of the husband
Age^2	Age of the husband squared
Age 18-24	Dummy = 1 if husband is in the age group 18-24; 0 otherwise
Age 25-34	Dummy = 1 if husband is in the age group 25-34; 0 otherwise
Age 35-44	Dummy = 1 if husband is in the age group 35-44; 0 otherwise
Age 45-54	Dummy = 1 if husband is in the age group 45-54; 0 otherwise
Age 55-64	Dummy = 1 if husband is in the age group 55-64; 0 otherwise
Age 65+	Dummy = 1 if husband older than 64; 0 otherwise
High-school degree	Dummy = 1 if husband has a high-school degree; 0 otherwise
Some college	Dummy = 1 if husband has some college; 0 otherwise
College	Dummy = 1 if husband has a college degree; 0 otherwise
Non-white	Dummy = 1 if husband is non-white; 0 otherwise
Hispanic	Dummy = 1 if husband is Hispanic; 0 otherwise
Served in the military (*didserve*)	Dummy = 1 if husband served in the military; 0 otherwise
Wife's Characteristics	
Age	Age of the wife
Age^2	Age of the wife squared
Age 18-24	Dummy = 1 if wife is in the age group 18-24; 0 otherwise
Age 25-34	Dummy = 1 if wife is in the age group 25-34; 0 otherwise
Age 35-44	Dummy = 1 if wife is in the age group 35-44; 0 otherwise
Age 45-54	Dummy = 1 if wife is in the age group 45-54; 0 otherwise
Age 55-64	Dummy = 1 if wife is in the age group 55-64; 0 otherwise
Age 65+	Dummy = 1 if wife older than 64; 0 otherwise
High-school degree	Dummy = 1 if wife has a high-school degree; 0 otherwise
Some college	Dummy = 1 if wife has some college; 0 otherwise
College	Dummy = 1 if wife has a college degree; 0 otherwise
Non-white	Dummy = 1 if wife is non-white; 0 otherwise
Hispanic	Dummy = 1 if wife is Hispanic; 0 otherwise
Served in the military	Dummy = 1 if wife served in the military; 0 otherwise
Household Characteristics	
Numage05	Number of children in age group 0-5
Numage611	Number of children in age group 6-11
Numage1217	Number of children in age group 12-17
Transfinc	Transfer income / 1000
Notransfinc	Non-transfer income / 1000
Area Characteristics	
Non-MSA	Non metropolitan statistical area
Unemployment rate by county	Unemployment rate by county as percentage of the labor force
Wage by county	Average weekly wage by county/100

Table A3 – Coefficients of Non-Health Variables in Married Men's Labor Force Participation Equations

	Husband's Health Condition on Husband's Labor Force Participation			Wife's Health Condition on Her Husband's Labor Force Participation		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
age_f	0.3127	0.5237	0.1842	-0.2888	-0.2812	-0.6026
	(1.4480)	(1.4552)	(1.7763)	(0.8079)	(0.8119)	(0.4823)
age2_f	0.0169	-0.0033	0.0248	0.0432	0.0475	0.0698
	(0.1472)	(0.1408)	(0.1772)	(0.0819)	(0.0830)	(0.0510)
highschdegree_f	0.3279	0.3177	0.3065	0.7876***	0.7218***	0.6581***
	(0.3866)	(0.3635)	(0.4079)	(0.1896)	(0.2092)	(0.1350)
somecoll_f	1.6732***	1.8063***	1.7397***	1.2636***	1.0218***	0.9609***
	(0.4508)	(0.4558)	(0.4701)	(0.2366)	(0.2502)	(0.1575)
college_f	1.8164***	2.0345***	2.0085***	1.0203***	0.7710***	0.7448***
	(0.5097)	(0.5473)	(0.5397)	(0.2745)	(0.2774)	(0.1871)
nowhite_f	-0.2666	-0.3017	-0.2627	-0.4999	-0.3873	-0.5588**
	(0.5238)	(0.5937)	(0.5274)	(0.3518)	(0.3540)	(0.2470)
hispanic_f	0.2482	0.2780	0.1645	0.6170	0.4237	0.5321**
	(0.7058)	(0.7941)	(0.6399)	(0.4137)	(0.3917)	(0.2421)
age_m	2.8883	2.1729	3.2364	2.2720**	3.5136***	1.8421***
	(1.8119)	(1.8088)	(2.0735)	(0.9285)	(0.9442)	(0.5322)
age2_m	-0.5642***	-0.4966***	-0.5869***	-0.3836***	-0.5108***	-0.3012***
	(0.1862)	(0.1800)	(0.2087)	(0.0940)	(0.0988)	(0.0554)
highschdegree_m	1.5605***	1.6187***	1.6780***	0.8586***	0.7657***	0.6539***
	(0.4164)	(0.3571)	(0.4535)	(0.1863)	(0.2082)	(0.1315)
somecoll_m	1.4397***	1.4428***	1.5347***	0.7361***	0.5434**	0.5273***
	(0.4798)	(0.4452)	(0.5245)	(0.2266)	(0.2547)	(0.1581)
college_m	2.7407***	2.6861***	2.7387***	1.5479***	1.0679***	1.1547***
	(0.4838)	(0.4514)	(0.5313)	(0.2738)	(0.2667)	(0.1768)
nowhite_m	-1.3419**	-1.3651**	-1.4427**	-0.1697	-0.2072	-0.0438
	(0.5797)	(0.6347)	(0.5980)	(0.3694)	(0.3668)	(0.2615)
hispanic_m	-0.4443	-0.5570	-0.3547	0.0486	0.1050	-0.1715
	(0.7232)	(0.8271)	(0.6846)	(0.4045)	(0.3956)	(0.2367)
numage05	0.4548*	0.5216	0.5168**	-0.0463	-0.1224	-0.0022
	(0.2321)	(0.2276)	(0.2289)	(0.1456)	(0.1345)	(0.0911)
numage611	0.3432*	0.3919	0.3524*	-0.1364	-0.1605	-0.1513**
	(0.1887)	(0.1907)	(0.1973)	(0.1066)	(0.1128)	(0.0693)
numage1217	0.1307	0.1550	0.1247	-0.0114	-0.0368	0.0103
	(0.1832)	(0.1695)	(0.1798)	(0.0927)	(0.0985)	(0.0675)
transfinc	-0.1128***	-0.1043***	-0.1129***	-0.0556***	-0.0478***	-0.0553***
	(0.0135)	(0.0130)	(0.0136)	(0.0086)	(0.0082)	(0.0061)
notransfinc	0.0346*	0.0347*	0.0334*	0.0044	0.0042	0.0049
	(0.0187)	(0.0184)	(0.0180)	(0.0108)	(0.0126)	(0.0078)
didserve_f	-0.0368	0.0325	-0.1321	2.9849**	1.1650	1.3546**
	(1.0500)	(1.0754)	(1.0774)	(1.3902)	(1.0506)	(0.6090)
didserve_m	0.1342	0.1712	0.2293	-0.0385	0.1725	-0.0378
	(0.2889)	(0.2810)	(0.3001)	(0.1540)	(0.1681)	(0.1108)
nonmsa	0.1502	0.1934	0.1962	0.2084	0.1325	0.0449
	(0.2890)	(0.2956)	(0.3082)	(0.1774)	(0.1872)	(0.1098)
unemployrate	-0.1435***	-0.1434***	-0.1409***	-0.0529*	-0.0492*	-0.0519*
	(0.0470)	(0.0453)	(0.0464)	(0.0275)	(0.0288)	(0.0265)
wages by county	0.0524	0.0446	0.0630	0.0719	0.0576	0.0619
	(0.0883)	(0.0934)	(0.0966)	(0.0572)	(0.0578)	(0.0472)

Table A3 – (Continued)

arthritis	-0.8092**	-0.7930***	-0.9205***	-0.3305**	-0.3059*	-0.2465**
	(0.3338)	(0.3169)	(0.3302)	(0.1528)	(0.1695)	(0.1165)
back	-0.4617	-0.5183*	-0.5518*	-0.1703	-0.1877	-0.1185
	(0.2814)	(0.2755)	(0.2892)	(0.1621)	(0.1742)	(0.1183)
mental	-2.2019***	-2.1684***	-2.2726***	-0.1389	-0.0987	-0.1213
	(0.3719)	(0.3481)	(0.3655)	(0.1473)	(0.1622)	(0.1080)

Notes: *_f* denotes the wife and *_m* the husband. Each model has been estimated by random effects probit. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition (Duration^2). Other covariates include dummy variables for the year and month of interview. The sample is the matched sample of married men aged 18-64 with wives older than 18 described in Section 2.3.1, Table 6. Robust clustered standard errors are in parentheses. Table A1 in the Appendix presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table A4 – Coefficients of Non-Health Variables in Married Women's Labor Force Participation Equations

	Wife's Health Condition on Wife's Labor Force Participation			**Husband's Health Condition on His Wife's Labor Force Participation**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
age_f	4.4676***	6.5307***	4.2970***	6.2402***	4.5135***	6.5674***
	(0.6983)	(0.9681)	(0.4407)	(0.8070)	(0.7183)	(0.8457)
age2_f	-0.6005***	-0.8008***	-0.5694***	-0.7650***	-0.6089***	-0.8064***
	(0.0788)	(0.1080)	(0.0482)	(0.0915)	(0.0807)	(0.0940)
highschdegree_f	1.5883***	1.3949***	1.3839***	1.2298***	1.8029***	1.2679***
	(0.2734)	(0.2813)	(0.1227)	(0.2585)	(0.3341)	(0.2696)
somecoll_f	2.2167***	1.8534***	2.0587***	1.7193***	2.4324***	1.7245***
	(0.2953)	(0.2995)	(0.1403)	(0.2705)	(0.3515)	(0.2818)
college_f	2.9814***	3.0589***	2.8713***	2.9339***	3.1965***	2.9829***
	(0.3199)	(0.3310)	(0.1647)	(0.3021)	(0.3701)	(0.3257)
nowhite_f	-0.4059	0.5143	-0.5143**	0.4344	-0.4238	0.4645
	(0.2924)	(0.4171)	(0.2136)	(0.3831)	(0.2999)	(0.4079)
hispanic_f	-0.3816	-0.4480	-0.2355	-0.2557	-0.4193	-0.5247
	(0.3295)	(0.4094)	(0.2116)	(0.3727)	(0.3412)	(0.3929)
age_m	-0.1824	-0.3334	-0.3873	0.0816	-0.1674	0.1258
	(0.5676)	(0.9088)	(0.3699)	(0.7112)	(0.5801)	(0.7209)
age2_m	0.0067	-0.0213	0.0296	-0.0602	0.0063	-0.0717
	(0.0568)	(0.0950)	(0.0363)	(0.0740)	(0.0578)	(0.0728)
highschdegree_m	0.2065	0.4179*	0.2408*	0.3755*	0.2307	0.4179*
	(0.1948)	(0.2373)	(0.1241)	(0.2276)	(0.2082)	(0.2480)
somecoll_m	-0.1280	0.2055	-0.0581	0.1822	-0.1085	0.2240
	(0.2198)	(0.2674)	(0.1460)	(0.2543)	(0.2355)	(0.2802)
college_m	-0.5861**	-0.2119	-0.5897***	-0.2568	-0.5740**	-0.2255
	(0.2320)	(0.2865)	(0.1555)	(0.2704)	(0.2454)	(0.2985)
nowhite_m	0.4920*	0.8371*	0.5935***	0.8625**	0.5023*	0.8796**
	(0.2967)	(0.4311)	(0.2161)	(0.3908)	(0.3009)	(0.4209)
hispanic_m	-0.6552**	-0.7397*	-0.5071**	-0.7385*	-0.7353**	-0.8046**
	(0.3304)	(0.4156)	(0.2114)	(0.3793)	(0.3406)	(0.3955)
numage05	-0.6139***	-0.7181***	-0.6530***	-0.7263***	-0.6365***	-0.7137***
	(0.0869)	(0.1079)	(0.0608)	(0.0993)	(0.0844)	(0.1057)

Table A4 – (Continued)

numage611	-0.6381***	-0.5794***	-0.6460***	-0.5824***	-0.6583***	-0.5886***
	(0.0788)	(0.0971)	(0.0554)	(0.0870)	(0.0774)	(0.0944)
numage1217	-0.3133***	-0.3997***	-0.2867***	-0.4024***	-0.3269***	-0.4124***
	(0.0758)	(0.0989)	(0.0596)	(0.0911)	(0.0772)	(0.0974)
transfinc	-0.0342***	-0.0116	-0.0321***	-0.0127	-0.0347***	-0.0108
	(0.0077)	(0.0085)	(0.0060)	(0.0081)	(0.0079)	(0.0085)
notransfinc	-0.0039	-0.0155**	-0.0040	-0.0153**	-0.0032	-0.0152*
	(0.0071)	(0.0078)	(0.0062)	(0.0076)	(0.0073)	(0.0083)
didserve_f	0.8942	-0.5268	0.9972**	-0.5043	0.9067	-0.5278
	(0.6432)	(0.6882)	(0.4842)	(0.6456)	(0.6406)	(0.6583)
didserve_m	0.1861	0.3924**	0.1018	0.3778**	0.1767	0.4309**
	(0.1443)	(0.1900)	(0.1017)	(0.1736)	(0.1494)	(0.1898)
nonmsa	0.0783	0.0597	0.1382	0.0478	0.0801	0.0691
	(0.1432)	(0.1782)	(0.1060)	(0.1693)	(0.1475)	(0.1835)
unemployrate	-0.0933***	-0.1006***	-0.0900***	-0.0979***	-0.0983***	-0.0988***
	(0.0253)	(0.0319)	(0.0166)	(0.0288)	(0.0260)	(0.0342)
wages by county	0.0318	-0.0407	0.0102	-0.0386	0.0288	-0.0357
	(0.0411)	(0.0523)	(0.0304)	(0.0488)	(0.0427)	(0.0528)
arthritis	-0.2717**	-0.3486**	-0.2830***	-0.3028*	-0.2736**	-0.3362**
	(0.1379)	(0.1622)	(0.1045)	(0.1573)	(0.1389)	(0.1661)
back	-0.1912	0.2598	-0.1797*	0.2795*	-0.1992	0.2447
	(0.1278)	(0.1622)	(0.1033)	(0.1554)	(0.1291)	(0.1651)
mental	-0.5587***	-0.0070	-0.5625***	-0.0449	-0.5742***	0.0122
	(0.1226)	(0.1884)	(0.0926)	(0.1819)	(0.1228)	(0.1969)

Notes: *_f* denotes the wife and *_m* the husband. Each model has been estimated by random effects probit. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include dummy variables for the year and month of interview. The sample is the matched sample of married women aged 18-64 with husbands older than 18 described in Section 2.3.1, Table 6. Robust clustered standard errors are in parentheses. Table A1 in the Appendix presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%

Table A5 – Coefficients of Non-Health Variables in Married Men's Earnings Equations

	Husband's Health Condition on Husband's Log Weekly Earnings			Wife's Health Condition on Husband's Log Weekly Earnings		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Invmill1_m	-0.1403	-0.1285	-0.1481	-0.2297*	-0.2617*	-0.1956
	(0.1084)	(0.1079)	(0.1082)	(0.1311)	(0.1338)	(0.1254)
Invmill2_m	-0.1449	-0.1332	-0.1656	-0.1717	-0.1948	-0.1277
	(0.1207)	(0.1203)	(0.1211)	(0.1384)	(0.1397)	(0.1323)
Invmill3_m	-0.0952	-0.0660	-0.0925	-0.1759	-0.2008	-0.1418
	(0.1231)	(0.1210)	(0.1215)	(0.1367)	(0.1392)	(0.1308)
Invmill4_m	-0.2549*	-0.2133	-0.2379*	-0.2718*	-0.2930**	-0.2317*
	(0.1403)	(0.1382)	(0.1376)	(0.1429)	(0.1472)	(0.1370)
Invmill5_m	-0.2162	-0.1695	-0.1742	-0.2666*	-0.2957*	-0.2352*
	(0.1420)	(0.1409)	(0.1421)	(0.1462)	(0.1526)	(0.1402)
age_m	1.0640***	1.0695***	1.0617***	0.7333***	0.7287***	0.7423***
	(0.1110)	(0.1108)	(0.1108)	(0.0922)	(0.0929)	(0.0922)
age2_m	-0.1130***	-0.1138***	-0.1128***	-0.0755***	-0.0749***	-0.0769***
	(0.0129)	(0.0128)	(0.0129)	(0.0111)	(0.0112)	(0.0111)
highschdegree_m	0.2106***	0.2089***	0.2053***	0.1781***	0.1749***	0.1817***
	(0.0423)	(0.0423)	(0.0426)	(0.0334)	(0.0335)	(0.0330)
somecoll_m	0.3182***	0.3199***	0.3147***	0.3038***	0.3022***	0.3078***
	(0.0484)	(0.0485)	(0.0488)	(0.0370)	(0.0372)	(0.0367)
college_m	0.6120***	0.6136***	0.6114***	0.6079***	0.6059***	0.6139***
	(0.0486)	(0.0486)	(0.0486)	(0.0403)	(0.0407)	(0.0396)
nowhite_m	-0.1555***	-0.1582***	-0.1573***	-0.1425***	-0.1419***	-0.1437***
	(0.0404)	(0.0407)	(0.0409)	(0.0330)	(0.0329)	(0.0331)
hispanic_m	-0.1963***	-0.1970***	-0.1983***	-0.2483***	-0.2471***	-0.2484***
	(0.0397)	(0.0398)	(0.0398)	(0.0296)	(0.0298)	(0.0297)
numage05	0.0286	0.0284	0.0279	0.0150	0.0146	0.0146
	(0.0201)	(0.0202)	(0.0202)	(0.0155)	(0.0155)	(0.0155)
numage611	-0.0099	-0.0097	-0.0091	0.0163	0.0163	0.0155
	(0.0163)	(0.0164)	(0.0165)	(0.0131)	(0.0131)	(0.0131)
numage1217	-0.0347**	-0.0334*	-0.0322*	0.0024	0.0023	0.0028
	(0.0176)	(0.0176)	(0.0175)	(0.0136)	(0.0136)	(0.0136)
transfinc	-0.0107**	-0.0110**	-0.0102**	-0.0061**	-0.0058*	-0.0067**
	(0.0048)	(0.0047)	(0.0047)	(0.0030)	(0.0033)	(0.0029)
notransfinc	0.0066***	0.0067***	0.0063***	0.0060***	0.0063***	0.0060***
	(0.0017)	(0.0017)	(0.0017)	(0.0016)	(0.0016)	(0.0016)
arthritis	-0.0074	-0.0093	-0.0084	-0.0440	-0.1163	-0.0404
	(0.0393)	(0.0389)	(0.0389)	(0.1364)	(0.0751)	(0.1371)
back	0.0172	0.0146	0.0179	0.0166	0.0096	0.0212
	(0.0354)	(0.0354)	(0.0355)	(0.0257)	(0.0271)	(0.0729)
mental	-0.0297	-0.0335	-0.0321	0.1436	0.0254	0.1487
	(0.0447)	(0.0444)	(0.0445)	(0.1693)	(0.0240)	(0.1831)
wages by county	0.0753***	0.0757***	0.0751***	-0.5758***	0.1083	-0.5662***
	(0.0086)	(0.0086)	(0.0086)	(0.0568)	(0.1149)	(0.0551)

Notes: *_f* denotes the wife and *_m* the husband. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition (Duration^2). Other covariates include dummy variables for the year and month of interview. The samples are the matched samples of married men aged 18-64 with husbands older than 18 described in Section 2.3.1, Tables 4 and 7. Robust clustered standard errors are in parentheses. Table A1 presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table A6 – Coefficients of Non-Health Variables in Married Women's Earnings Equations

	Wife's Health Condition on Wife's Weekly Earnings			Husband's Health Condition on His Wife's Weekly Earnings		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Invmill1_f	0.0411	0.0374	0.0238	0.0865	0.1207	0.1407
	(0.1163)	(0.1138)	(0.1122)	(0.1284)	(0.1234)	(0.1220)
Invmill2_f	0.0157	0.0241	0.0097	0.0184	0.0415	0.0809
	(0.1323)	(0.1282)	(0.1266)	(0.1413)	(0.1319)	(0.1296)
Invmill3_f	0.0652	0.0747	0.0542	0.0001	0.0325	0.0584
	(0.1260)	(0.1249)	(0.1233)	(0.1395)	(0.1335)	(0.1334)
Invmill4_f	0.1634	0.1723	0.1557	0.0516	0.0708	0.0919
	(0.1315)	(0.1290)	(0.1279)	(0.1298)	(0.1244)	(0.1229)
Invmill5_f	0.2034	0.2005	0.1842	0.1355	0.1624	0.1842
	(0.1347)	(0.1315)	(0.1304)	(0.1363)	(0.1311)	(0.1290)
age_f	0.6731***	0.6769***	0.6721***	0.5616***	0.5604***	0.5680***
	(0.1237)	(0.1230)	(0.1228)	(0.1295)	(0.1276)	(0.1258)
age2_f	-0.0785***	-0.0788***	-0.0778***	-0.0638***	-0.0640***	-0.0654***
	(0.0153)	(0.0152)	(0.0151)	(0.0161)	(0.0157)	(0.0155)
highschdegree_f	0.1654***	0.1635***	0.1604***	0.2368***	0.2399***	0.2474***
	(0.0440)	(0.0439)	(0.0439)	(0.0506)	(0.0502)	(0.0499)
somecoll_f	0.3789***	0.3800***	0.3757***	0.4571***	0.4633***	0.4717***
	(0.0508)	(0.0502)	(0.0501)	(0.0563)	(0.0553)	(0.0544)
college_f	0.7489***	0.7508***	0.7447***	0.8369***	0.8466***	0.8579***
	(0.0568)	(0.0559)	(0.0557)	(0.0649)	(0.0634)	(0.0625)
nowhite_f	0.0212	0.0232	0.0231	0.0353	0.0365	0.0399
	(0.0356)	(0.0358)	(0.0358)	(0.0438)	(0.0436)	(0.0435)
hispanic_f	-0.0824**	-0.0835**	-0.0803**	-0.1127**	-0.1164**	-0.1196**
	(0.0393)	(0.0391)	(0.0389)	(0.0492)	(0.0490)	(0.0491)
numage05	-0.0748**	-0.0758**	-0.0737**	-0.0962***	-0.1008***	-0.1052***
	(0.0296)	(0.0296)	(0.0295)	(0.0356)	(0.0348)	(0.0349)
numage611	-0.1215***	-0.1224***	-0.1204***	-0.1007***	-0.1003***	-0.1032***
	(0.0259)	(0.0259)	(0.0259)	(0.0263)	(0.0260)	(0.0257)
numage1217	-0.0984***	-0.0987***	-0.1004***	-0.0602**	-0.0608**	-0.0617***
	(0.0189)	(0.0189)	(0.0190)	(0.0238)	(0.0237)	(0.0236)
transfinc	-0.0026	-0.0025	-0.0024	-0.0014	-0.0018	-0.0017
	(0.0028)	(0.0027)	(0.0028)	(0.0029)	(0.0029)	(0.0029)
notransfinc	0.0002	0.0003	0.0005	0.0006	0.0007	0.0006
	(0.0029)	(0.0029)	(0.0029)	(0.0026)	(0.0025)	(0.0025)
annaww2	0.0605***	0.0610***	0.0613***	0.0571***	0.0568***	0.0574***
	(0.0088)	(0.0088)	(0.0088)	(0.0099)	(0.0099)	(0.0099)
arthritis	-0.0843**	-0.0807**	-0.0765*	0.0028	0.0047	0.0010
	(0.0397)	(0.0398)	(0.0398)	(0.0430)	(0.0432)	(0.0432)
back	0.0262	0.0288	0.0270	-0.0514	-0.0532	-0.0536
	(0.0334)	(0.0333)	(0.0332)	(0.0401)	(0.0400)	(0.0399)
mental	-0.0753**	-0.0777**	-0.0759**	0.0182	0.0219	0.0212
	(0.0339)	(0.0339)	(0.0340)	(0.0397)	(0.0394)	(0.0396)

Notes: *_f* denotes the wife and *_m* the husband. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include dummy variables for the year and month of interview. The samples are the matched samples of married women aged 18-64 with wives older than 18 described in Section 2.3.1, Tables 4 and 7. Robust clustered standard errors are in parentheses. Table A1 in the Appendix presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table A7 – Coefficients of Non-Health Variables in Married Men's Hourly Wages Equations

	Husband's Health Condition on Husband's Log Hourly Wages			Wife's Health Condition on Husband's Log Hourly Wages		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Invmill1_m	0.0690	0.0800	0.0787	-0.0772	-0.0490	-0.0610
	(0.0980)	(0.0952)	(0.1000)	(0.1011)	(0.1085)	(0.0961)
Invmill2_m	0.1558	0.1527	0.1479	-0.0095	0.0124	-0.0070
	(0.1169)	(0.1130)	(0.1205)	(0.1059)	(0.1110)	(0.0977)
Invmill3_m	0.0921	0.0922	0.0919	-0.0239	-0.0104	-0.0158
	(0.1013)	(0.0952)	(0.1012)	(0.1037)	(0.1091)	(0.0982)
Invmill4_m	0.2792*	0.3044*	0.3057*	-0.0339	0.0010	-0.0222
	(0.1653)	(0.1569)	(0.1654)	(0.1073)	(0.1162)	(0.1010)
Invmill5_m	0.2928*	0.3192**	0.3406**	0.0007	0.0266	0.0334
	(0.1612)	(0.1533)	(0.1630)	(0.1153)	(0.1247)	(0.1119)
hourhat_m	0.0693***	0.0708***	0.0696***	0.0419***	0.0423***	0.0437***
	(0.0197)	(0.0191)	(0.0199)	(0.0141)	(0.0142)	(0.0140)
age_m	0.3415**	0.3471**	0.3477**	0.3323***	0.3384***	0.3232***
	(0.1430)	(0.1380)	(0.1431)	(0.0983)	(0.0964)	(0.0993)
age2_m	-0.0290*	-0.0297*	-0.0300*	-0.0267**	-0.0277**	-0.0257**
	(0.0166)	(0.0160)	(0.0166)	(0.0120)	(0.0117)	(0.0121)
highschdegree_m	0.2588***	0.2608***	0.2621***	0.1783***	0.1792***	0.1803***
	(0.0364)	(0.0363)	(0.0373)	(0.0253)	(0.0254)	(0.0252)
somecoll_m	0.3616***	0.3578***	0.3612***	0.3096***	0.3112***	0.3114***
	(0.0384)	(0.0377)	(0.0388)	(0.0281)	(0.0281)	(0.0280)
college_m	0.5997***	0.5954***	0.5988***	0.5897***	0.5919***	0.5916***
	(0.0359)	(0.0360)	(0.0359)	(0.0300)	(0.0299)	(0.0299)
nowhite_m	-0.0867**	-0.0919***	-0.0918***	-0.0641**	-0.0657**	-0.0621**
	(0.0340)	(0.0336)	(0.0340)	(0.0314)	(0.0310)	(0.0315)
hispanic_m	-0.0328	-0.0294	-0.0321	-0.1631***	-0.1627***	-0.1608***
	(0.0487)	(0.0479)	(0.0491)	(0.0322)	(0.0321)	(0.0321)
wages by county	0.0664***	0.0664***	0.0669***	0.0681***	0.0681***	0.0680***
	(0.0072)	(0.0072)	(0.0071)	(0.0060)	(0.0060)	(0.0060)
arthritis	0.0659*	0.0663*	0.0617*	0.0504**	0.0511**	0.0508**
	(0.0352)	(0.0349)	(0.0349)	(0.0252)	(0.0252)	(0.0253)
back	-0.0149	-0.0150	-0.0146	-0.0069	-0.0050	-0.0035
	(0.0302)	(0.0299)	(0.0303)	(0.0231)	(0.0230)	(0.0229)
mental	0.0968**	0.0926**	0.0914**	-0.0015	-0.0010	-0.0020
	(0.0408)	(0.0403)	(0.0408)	(0.0208)	(0.0209)	(0.0210)

Notes: *_f* denotes the wife and *_m* the husband. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include dummy variables for the year and month of interview. The samples are the matched samples of married men aged 18-64 with husbands older than 18 described in Section 2.3.1, Tables 4 and 7. Robust clustered standard errors are in parentheses. Table A1 in the Appendix presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table A8 – Coefficients of Non-Health Variables in Married Women's Hourly Wages Equations

	Wife's Health Condition on Wife's Log Hourly Wages			Husband's Health Condition on His Wife's Log Hourly Wages		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Invmill1_f	0.0205	0.0353	0.0294	0.1121	0.1113	0.1271
	(0.0704)	(0.0705)	(0.0699)	(0.0953)	(0.0881)	(0.0851)
Invmill2_f	0.0589	0.0732	0.0651	0.1260	0.1240	0.1504
	(0.0825)	(0.0800)	(0.0797)	(0.1091)	(0.1020)	(0.0960)
Invmill3_f	0.0536	0.0688	0.0592	0.0767	0.0757	0.0972
	(0.0768)	(0.0744)	(0.0740)	(0.1029)	(0.0968)	(0.0940)
Invmill4_f	0.1437*	0.1487*	0.1475*	0.1502	0.1320	0.1561
	(0.0811)	(0.0788)	(0.0789)	(0.1041)	(0.0979)	(0.0952)
Invmill5_f	0.1720**	0.1721**	0.1746**	0.1993*	0.1818*	0.2033**
	(0.0802)	(0.0778)	(0.0780)	(0.1040)	(0.0968)	(0.0938)
Hour_hat_f	0.0144**	0.0144**	0.0144**	0.0153*	0.0137	0.0147*
	(0.0059)	(0.0059)	(0.0059)	(0.0089)	(0.0085)	(0.0082)
age_f	0.3519***	0.3534***	0.3514***	0.4243***	0.4119***	0.4125***
	(0.0717)	(0.0713)	(0.0713)	(0.0802)	(0.0778)	(0.0767)
age2_f	-0.0341***	-0.0343***	-0.0339***	-0.0427***	-0.0411***	-0.0413***
	(0.0086)	(0.0086)	(0.0086)	(0.0097)	(0.0094)	(0.0092)
highschdegree_f	0.2528***	0.2518***	0.2519***	0.2133***	0.2134***	0.2180***
	(0.0347)	(0.0345)	(0.0346)	(0.0312)	(0.0307)	(0.0303)
somecoll_f	0.4456***	0.4468***	0.4461***	0.4327***	0.4331***	0.4360***
	(0.0378)	(0.0374)	(0.0375)	(0.0367)	(0.0359)	(0.0348)
college_f	0.7695***	0.7721***	0.7712***	0.7665***	0.7669***	0.7708***
	(0.0373)	(0.0368)	(0.0369)	(0.0397)	(0.0392)	(0.0386)
nowhite_f	-0.0807***	-0.0778***	-0.0774***	-0.0903***	-0.0888**	-0.0912***
	(0.0279)	(0.0279)	(0.0279)	(0.0348)	(0.0348)	(0.0351)
hispanic_f	-0.0790***	-0.0814***	-0.0808***	-0.1273***	-0.1290***	-0.1316***
	(0.0274)	(0.0272)	(0.0270)	(0.0346)	(0.0345)	(0.0344)
annaww2	0.0720***	0.0719***	0.0718***	0.0612***	0.0609***	0.0604***
	(0.0063)	(0.0062)	(0.0062)	(0.0072)	(0.0072)	(0.0072)
arthritis	-0.0208	-0.0207	-0.0186	-0.0119	-0.0124	-0.0186
	(0.0268)	(0.0269)	(0.0269)	(0.0284)	(0.0285)	(0.0286)
back	0.0392*	0.0389*	0.0377	-0.0085	-0.0131	-0.0085
	(0.0233)	(0.0233)	(0.0232)	(0.0284)	(0.0282)	(0.0283)
mental	-0.0493**	-0.0513**	-0.0506**	-0.0250	-0.0214	-0.0216
	(0.0223)	(0.0224)	(0.0224)	(0.0295)	(0.0295)	(0.0295)

Notes: *_f* denotes the wife and *_m* the husband. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition ($Duration^2$). Other covariates include dummy variables for the year and month of interview. The samples are the matched samples of married women aged 18-64 with wives older than 18 described in Section 2.3.1, Tables 4 and 7. Robust clustered standard errors are in parentheses. Table A1 presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table A9 – Coefficients of Non-Health Variables in Married Men's Labor Supply Equations

	Husband's health condition on Husband's Weekly Hours of Work			Wife's health condition on Husband's Weekly Hours of Work		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Invmill1_m	-2.4774	-3.7475*	-2.1058	-3.7475*	-2.4774	-2.1058
	(2.2366)	(2.2557)	(2.1383)	(2.2557)	(2.2366)	(2.1383)
Invmill2_m	-2.5827	-3.6074	-1.8319	-3.6074	-2.5827	-1.8319
	(2.2592)	(2.2772)	(2.1580)	(2.2772)	(2.2592)	(2.1580)
Invmill3_m	-2.2636	-3.2223	-1.7954	-3.2223	-2.2636	-1.7954
	(2.2348)	(2.2333)	(2.1466)	(2.2333)	(2.2348)	(2.1466)
Invmill4_m	-3.1123	-4.3307	-2.6002	-4.3307	-3.1123	-2.6002
	(2.6539)	(2.6604)	(2.5811)	(2.6604)	(2.6539)	(2.5811)
Invmill5_m	-3.6366	-4.8317*	-3.5228	-4.8317*	-3.6366	-3.5228
	(2.6588)	(2.7063)	(2.5911)	(2.7063)	(2.6588)	(2.5911)
Log wage_hat_m	0.5037	0.3424	0.5698	0.3424	0.5037	0.5698
	(0.8341)	(0.8349)	(0.8246)	(0.8349)	(0.8341)	(0.8246)
age_m	5.3130***	5.1819***	5.4336***	5.1819***	5.3130***	5.4336***
	(1.8436)	(1.8453)	(1.8461)	(1.8453)	(1.8436)	(1.8461)
age2_m	-0.6496***	-0.6224***	-0.6681***	-0.6224***	-0.6496***	-0.6681***
	(0.2117)	(0.2122)	(0.2121)	(0.2122)	(0.2117)	(0.2121)
nowhite_m	-1.1961*	-1.1559*	-1.2000*	-1.1559*	-1.1961*	-1.2000*
	(0.6150)	(0.6114)	(0.6171)	(0.6114)	(0.6150)	(0.6171)
hispanic_m	-1.2395**	-1.2393**	-1.2256**	-1.2393**	-1.2395**	-1.2256**
	(0.5664)	(0.5638)	(0.5673)	(0.5638)	(0.5664)	(0.5673)
numage05	0.5404	0.5444	0.5187	0.5444	0.5404	0.5187
	(0.3474)	(0.3465)	(0.3480)	(0.3465)	(0.3474)	(0.3480)
numage611	0.1722	0.1802	0.1577	0.1802	0.1722	0.1577
	(0.2460)	(0.2448)	(0.2460)	(0.2448)	(0.2460)	(0.2460)
numage1217	0.0059	-0.0120	-0.0055	-0.0120	0.0059	-0.0055
	(0.2547)	(0.2533)	(0.2546)	(0.2533)	(0.2547)	(0.2546)
transfinc	-0.0651	-0.0470	-0.0725	-0.0470	-0.0651	-0.0725
	(0.0468)	(0.0488)	(0.0453)	(0.0488)	(0.0468)	(0.0453)
notransfinc	0.0672**	0.0701**	0.0677**	0.0701**	0.0672**	0.0677**
	(0.0305)	(0.0307)	(0.0306)	(0.0307)	(0.0305)	(0.0306)
arthritis	-0.2814	-0.2495	-0.2883	-0.2495	-0.2814	-0.2883
	(0.5462)	(0.5423)	(0.5449)	(0.5423)	(0.5462)	(0.5449)
back	0.1524	0.2022	0.1114	0.2022	0.1524	0.1114
	(0.4910)	(0.4947)	(0.4909)	(0.4947)	(0.4910)	(0.4909)
mental	0.4108	0.3820	0.4153	0.3820	0.4108	0.4153
	(0.4784)	(0.4760)	(0.4787)	(0.4760)	(0.4784)	(0.4787)

Notes: *_f* denotes the wife and *_m* the husband. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition (Duration^2). Other covariates include dummy variables for the year and month of interview. The samples are the matched samples of married men aged 18-64 with husbands older than 18 described in Section 2.3.1, Tables 4 and 7. Robust clustered standard errors are in parentheses. Table A1 presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table A10 – Coefficients of Non-Health Variables in Married Women's Labor Supply Equations

	Wife's health condition on Wife's Weekly Hours of Work			Husband's health condition on Wife's Weekly Hours of Work		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Invmill1_f	2.3082	1.9067	1.8231	-2.2634	-1.7240	-1.6223
	(1.6255)	(1.6108)	(1.5934)	(1.9394)	(1.8890)	(1.8155)
Invmill2_f	1.6741	1.5807	1.5211	-3.4663	-3.1518	-2.9310
	(1.8913)	(1.8498)	(1.8326)	(2.1217)	(2.0121)	(1.9172)
Invmill3_f	2.1905	2.1982	2.0914	-2.6342	-2.1923	-2.1124
	(1.8209)	(1.7959)	(1.7914)	(2.0405)	(1.9626)	(1.9009)
Invmill4_f	2.2854	2.3493	2.1323	-3.2621*	-2.7723	-2.7804
	(1.8441)	(1.8280)	(1.8148)	(1.9315)	(1.8556)	(1.7844)
Invmill5_f	2.6757	2.6518	2.3894	-2.9945	-2.3619	-2.3270
	(1.9172)	(1.8856)	(1.8710)	(1.9505)	(1.8834)	(1.8213)
Log wage_hat_f	1.8687**	1.9091**	1.8674**	1.2633	1.4747	1.6348*
	(0.8863)	(0.8763)	(0.8792)	(0.9549)	(0.9456)	(0.9309)
age_f	3.5769*	3.5763*	3.5616*	0.3116	0.3685	0.4734
	(1.9513)	(1.9470)	(1.9461)	(2.0202)	(2.0223)	(2.0085)
age2_f	-0.5951**	-0.5921**	-0.5839**	-0.1054	-0.1215	-0.1407
	(0.2360)	(0.2353)	(0.2350)	(0.2485)	(0.2480)	(0.2455)
nowhite_f	1.8412***	1.8168***	1.8153***	2.0043***	2.0507***	2.1516***
	(0.5828)	(0.5804)	(0.5814)	(0.7165)	(0.7169)	(0.7094)
hispanic_f	-0.6015	-0.5569	-0.5119	0.3281	0.3041	0.3124
	(0.6602)	(0.6583)	(0.6581)	(0.8373)	(0.8369)	(0.8336)
numage05	-2.2457***	-2.2755***	-2.2578***	-1.8678***	-1.9617***	-2.0001***
	(0.4537)	(0.4521)	(0.4520)	(0.5467)	(0.5345)	(0.5273)
numage611	-2.3037***	-2.3142***	-2.2984***	-1.3188***	-1.3455***	-1.3825***
	(0.3662)	(0.3661)	(0.3656)	(0.4018)	(0.4004)	(0.3973)
numage1217	-0.9341***	-0.9070***	-0.9245***	-0.6833*	-0.6909*	-0.7163*
	(0.3160)	(0.3167)	(0.3183)	(0.3674)	(0.3665)	(0.3660)
transfinc	-0.0508	-0.0515	-0.0515	-0.0266	-0.0346	-0.0309
	(0.0352)	(0.0349)	(0.0349)	(0.0386)	(0.0387)	(0.0380)
notransfinc	-0.1037**	-0.1007**	-0.1000**	-0.0758*	-0.0758*	-0.0766*
	(0.0459)	(0.0461)	(0.0462)	(0.0433)	(0.0430)	(0.0426)
arthritis	-1.7347***	-1.6322**	-1.6198**	0.4093	0.4806	0.5239
	(0.6514)	(0.6524)	(0.6525)	(0.7305)	(0.7391)	(0.7358)
back	-0.5216	-0.4569	-0.4656	-0.9301	-0.9078	-0.9824
	(0.5444)	(0.5462)	(0.5458)	(0.6237)	(0.6225)	(0.6185)
mental	-0.7706	-0.7728	-0.7603	0.6034	0.6457	0.6223
	(0.5442)	(0.5452)	(0.5450)	(0.6301)	(0.6256)	(0.6263)

Notes: *_f* denotes the wife and *_m* the husband. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Model 1 does not control for the duration of the health condition (i.e., the number of years that the individual has had a health condition); Model 2 controls for the duration of the health condition; Model 3 also includes the squared of the duration of the health condition (Duration^2). Other covariates include dummy variables for the year and month of interview. The samples are the matched samples of married women aged 18-64 with wives older than 18 described in Section 2.3.1, Tables 4 and 7. Robust clustered standard errors are in parentheses. Table A1 presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table A11 - Marginal Effects of a Married Man and Woman's Health Condition on His/her Spouse's Labor Force Participation by Age Group

	Wife's Labor Force participation				
Husband's Health Condition	**Age18-24**	**Age25-34**	**Age35-44**	**Age45-54**	**Age55-64**
Cancer	0.0046	0.0020	0.0015	0.0025	0.0076
Severe Cancer	0.0065	0.0045	0.0045	0.0069	0.0126
Stroke	-0.0026	-0.0012	-0.0009	-0.0015	-0.0042
Ischemic Heart Disease	0.0026	0.0012	0.0009	0.0014	0.0043
Emphysema	-0.0081	-0.0037	-0.0028	-0.0046	-0.0129
Chronic bronchitis	-0.0047	-0.0021	-0.0016	-0.0026	-0.0075
Asthma	-0.0026	-0.0012	-0.0009	-0.0014	-0.0042
COPD	-0.0050	-0.0024	-0.0019	-0.0030	-0.0081
	Husband's Labor Force participation				
Wife's Health Condition	**Age18-24**	**Age25-34**	**Age35-44**	**Age45-54**	**Age55-64**
Cancer	-0.0044	-0.0041	-0.0046	-0.0062	-0.0084
Severe Cancer	-0.0018	-0.0019	-0.0023	-0.0029	-0.0031
Stroke	-0.0441	-0.0411	-0.0464	-0.0609	-0.0780
Ischemic Heart Disease	0.0066	0.0061	0.0070	0.0096	0.0130
Emphysema	-0.0039	-0.0036	-0.0041	-0.0056	-0.0075
Chronic bronchitis	-0.0040	-0.0037	-0.0043	-0.0058	-0.0077
Asthma	-0.0152	-0.0141	-0.0161	-0.0215	-0.0285
COPD	-0.0207	-0.0207	-0.0204	-0.0177	-0.0107

Notes: Marginal effects for the health condition are for discrete change of the dummy variable from 0 to 1. They have been calculated by using the estimated coefficients of Model 1 in Tables 14 and 15 for the average husband and wife in the sample (white, non-Hispanic, and with a high school degree). The samples are the matched sample of married men and women aged 18-64 described in Section 2.3.1, Table 9. Table A1 in the Appendix presents the definition of each condition.

Table A12 – Estimates of the Effects of a Married Man's Health Condition on His and His Wife's Labor Market Decisions based on the Original Sample

Husband's Health Condition	Husband's				Wife's			
	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
Cancer	-0.3515*	-0.0282	-0.0759	-0.0295	0.8171***	-0.0260	-0.7093	0.0462
	(0.1836)	(0.0402)	(0.6843)	(0.0340)	(0.1714)	(0.0446)	(0.7473)	(0.0314)
Duration	-0.1903***	0.0052	0.1696	-0.0118	-0.0160	0.0284**	0.5421***	-0.0171*
	(0.0469)	(0.0142)	(0.2187)	(0.0127)	(0.0514)	(0.0135)	(0.1868)	(0.0099)
Duration^2	0.0064***	0.0003	-0.0048	0.0007**	0.0018	-0.0016***	-0.0322***	0.0008**
	(0.0021)	(0.0004)	(0.0051)	(0.0003)	(0.0019)	(0.0004)	(0.0062)	(0.0004)
Severe Cancer	-0.6691***	0.0547	0.7650	0.0237	0.8229***	-0.0387	-0.8055	0.0388
	(0.1701)	(0.0419)	(0.7335)	(0.0377)	(0.1785)	(0.0499)	(0.8251)	(0.0349)
Duration	-0.3838***	0.0064	0.0436	0.0017	-0.0166	-0.0425*	0.6378	-0.0736***
	(0.0861)	(0.0353)	(0.6422)	(0.0260)	(0.0536)	(0.0222)	(0.4016)	(0.0180)
Duration^2	0.0063**	0.0006	0.0236	-0.0002	0.0018	0.0026**	-0.0479**	0.0046***
	(0.0026)	(0.0026)	(0.0537)	(0.0020)	(0.0019)	(0.0013)	(0.0238)	(0.0011)
Stroke	-2.2658***	0.0536	-1.8851	0.1412	1.2011**	0.1040	0.3413	0.1051
	(0.5317)	(0.1176)	(1.7718)	(0.1219)	(0.5503)	(0.1349)	(1.5106)	(0.0987)
Duration	-1.5240***	-0.0504	-0.9074	-0.0096	-0.7811**	0.0626	3.2592***	-0.1251***
	(0.1891)	(0.0652)	(1.2384)	(0.0546)	(0.3351)	(0.0569)	(0.8983)	(0.0372)
Duration^2	0.0560***	0.0055	0.0138	0.0062*	0.0671**	-0.0027	-0.2025***	0.0090***
	(0.0099)	(0.0040)	(0.0838)	(0.0032)	(0.0330)	(0.0037)	(0.0570)	(0.0025)
Ischemic Heart Disease	-0.9702**	-0.2074**	-1.5179*	-0.1252	0.3176	-0.0000	-0.2354	0.0414
	(0.3961)	(0.0918)	(0.8056)	(0.0812)	(0.3984)	(0.0919)	(1.5174)	(0.0451)
Duration	-0.0447	-0.0057	-0.4067	0.0338	-0.0923	-0.0074	-0.2198	-0.0041
	(0.0833)	(0.0275)	(0.3890)	(0.0214)	(0.0653)	(0.0173)	(0.2392)	(0.0124)
Duration^2	-0.0183***	-0.0007	0.0011	-0.0013	0.0056*	0.0000	0.0089	-0.0002
	(0.0048)	(0.0019)	(0.0240)	(0.0015)	(0.0028)	(0.0005)	(0.0077)	(0.0003)

Table A12 – (continued)

Husband's Health Condition	Husband's				Wife's			
	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
Emphysema	-1.4694	-0.6012***	-4.4252***	-0.2346*	-6.8672***	-0.0974	0.0522	-0.0171
	(1.0926)	(0.1641)	(1.2957)	(0.1399)	(2.2560)	(0.1210)	(2.3045)	(0.0701)
Duration	-0.2938**	-0.0148	0.2485	-0.0447**	0.1139	-0.0194	0.1628	-0.0245
	(0.1259)	(0.0330)	(0.8513)	(0.0220)	(0.1160)	(0.0298)	(0.5118)	(0.0177)
$Duration^2$	0.0030	0.0004	0.0163	-0.0006	-0.0110**	0.0013	0.0069	0.0007
	(0.0047)	(0.0011)	(0.0310)	(0.0008)	(0.0044)	(0.0010)	(0.0161)	(0.0005)
Chronic Bronchitis	0.1466	-0.0117	-0.5416	0.0283	-0.2730***	0.0135	0.1228	-0.0263
	(0.1340)	(0.0197)	(0.3420)	(0.0174)	(0.0924)	(0.0223)	(0.4146)	(0.0173)
Duration	-0.0319	-0.0892***	-0.9940***	-0.0076	0.0830	-0.0115	0.1634	-0.0253
	(0.0912)	(0.0146)	(0.2590)	(0.0154)	(0.0991)	(0.0174)	(0.2698)	(0.0164)
$Duration^2$	-0.0011	0.0023***	0.0226***	0.0004	-0.0018	0.0001	-0.0031	0.0004
	(0.0025)	(0.0003)	(0.0060)	(0.0004)	(0.0028)	(0.0004)	(0.0063)	(0.0004)
COPD	0.0809	-0.0132	-0.5518	0.0267	-0.3186***	0.0154	0.0988	-0.0241
	(0.0918)	(0.0197)	(0.3416)	(0.0174)	(0.0797)	(0.0224)	(0.4150)	(0.0174)
Duration	-0.1829***	-0.0512***	-0.1510	-0.0442***	-0.0183	-0.0113	0.3578	-0.0251**
	(0.0433)	(0.0150)	(0.3594)	(0.0099)	(0.0486)	(0.0181)	(0.2907)	(0.0128)
$Duration^2$	0.0036***	0.0013***	0.0036	0.0011***	-0.0008	0.0003	-0.0070	0.0005
	(0.0014)	(0.0004)	(0.0083)	(0.0003)	(0.0015)	(0.0005)	(0.0069)	(0.0003)
Asthma	-0.8867***	-0.0198	1.1545	-0.1054***	-0.4001*	-0.0469	-1.1498	-0.0165
	(0.2274)	(0.0452)	(0.9564)	(0.0352)	(0.2045)	(0.0565)	(0.9549)	(0.0433)
Duration	0.0181	0.0005	0.1790	-0.0123**	0.0033	-0.0130**	-0.2519**	0.0016
	(0.0334)	(0.0062)	(0.1139)	(0.0054)	(0.0290)	(0.0051)	(0.0985)	(0.0035)
$Duration^2$	0.0001	-0.0000	-0.0042*	0.0003**	0.0003	0.0003***	0.0051***	0.0001
	(0.0007)	(0.0001)	(0.0024)	(0.0001)	(0.0006)	(0.0001)	(0.0018)	(0.0001)

Note: Each model has been estimated as described in Section 2.4. It includes a dummy variable for the health condition, a duration variable for how long the person has had the illness and duration squared. The sample refers to the original 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old, as described in Section 2.3.1, Tables 3 and 4. Robust clustered standard errors are in parentheses. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table A13 – Estimates of the Effects of a Married Woman's Health Condition on Her and Her Husband's Labor Market Decisions based on the Original Sample

Wife's Health Condition	Husband's				Wife's		
	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
Cancer	0.1875	0.0698**	0.3880	0.0413	0.0435	-0.0020	0.0123
	(0.1738)	(0.0286)	(0.4789)	(0.0255)	(0.0318)	(0.5117)	(0.0237)
Duration	0.2670***	-0.0168	-0.2934	0.0071	0.0333	-0.1775	0.0274*
	(0.0839)	(0.0160)	(0.3167)	(0.0130)	(0.0248)	(0.3791)	(0.0149)
Duration^2	-0.0093**	0.0009	0.0262	-0.0007	-0.0024*	-0.0013	-0.0014*
	(0.0047)	(0.0010)	(0.0206)	(0.0008)	(0.0012)	(0.0208)	(0.0008)
Severe Cancer	-0.0619	0.0357	0.1126	0.0160	0.0360	0.1000	0.0058
	(0.0539)	(0.0295)	(0.5026)	(0.0265)	(0.0322)	(0.5373)	(0.0240)
Duration	0.1437***	-0.0092	-0.1642	0.0146	-0.0008	-0.8477**	0.0325*
	(0.0328)	(0.0175)	(0.3472)	(0.0142)	(0.0280)	(0.4169)	(0.0178)
Duration^2	-0.0053***	0.0005	0.0114	-0.0009	-0.0003	0.0439*	-0.0016
	(0.0020)	(0.0011)	(0.0216)	(0.0009)	(0.0015)	(0.0224)	(0.0010)
Stroke	-1.4674**	0.4792***	4.2902	0.2323*	-0.5917*	-7.3912**	0.0466
	(0.5886)	(0.1266)	(3.2197)	(0.1371)	(0.3187)	(3.5294)	(0.1284)
Duration	-0.6642**	0.1051*	1.3877	-0.0147	0.2629	0.8366	0.2438***
	(0.3119)	(0.0635)	(0.9946)	(0.0550)	(0.1636)	(3.1164)	(0.0891)
Duration^2	0.0363	-0.0162**	-0.1922	-0.0007	-0.0357**	-0.0778	-0.0315***
	(0.0295)	(0.0071)	(0.1327)	(0.0061)	(0.0176)	(0.3287)	(0.0101)
Ischemic Heart Disease	-0.1322	-0.0205	1.7276	-0.1375	0.0484	-2.8256	0.1127***
	(0.4687)	(0.0922)	(1.3722)	(0.0934)	(0.0753)	(2.1104)	(0.0387)
Duration	0.1277	0.0272	-1.1587	0.0918**	-0.0351	0.8219	-0.0958***
	(0.2048)	(0.0515)	(0.8680)	(0.0399)	(0.0652)	(1.1323)	(0.0368)
Duration^2	-0.0045	-0.0010	0.1080*	-0.0070***	0.0057	0.0503	0.0045**
	(0.0139)	(0.0035)	(0.0641)	(0.0026)	(0.0040)	(0.0718)	(0.0022)

Table A13 – (continued)

Wife's Health Condition	Husband's				Wife's		
	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
Emphysema	8.1372	-0.5879***	-2.1612***	-0.4143***	-0.3160***	6.5601***	-0.5138***
	(390.2459)	(0.0355)	(0.4993)	(0.0466)	(0.1202)	(1.8381)	(0.1313)
Duration	0.0058	0.0385	0.0666	0.0432	0.0133	-2.3485	0.1265**
	(0.2999)	(0.0506)	(0.9232)	(0.0297)	(0.1226)	(3.9835)	(0.0543)
Duration^2	-0.0127	-0.0025	-0.0271	-0.0017	-0.0045	0.1489	-0.0125***
	(0.0183)	(0.0031)	(0.0594)	(0.0019)	(0.0095)	(0.2992)	(0.0045)
Chronic Bronchitis	-0.1068	0.0185	0.7530**	-0.0201	0.0439**	0.9161***	-0.0003
	(0.0950)	(0.0168)	(0.3371)	(0.0155)	(0.0217)	(0.3445)	(0.0162)
Duration	-0.0340	0.0075	0.1472	-0.0033	-0.0036	0.0903	-0.0128
	(0.0684)	(0.0173)	(0.2866)	(0.0125)	(0.0141)	(0.2711)	(0.0107)
Duration^2	-0.0017	-0.0008	-0.0114	-0.0001	0.0002	-0.0025	0.0004
	(0.0018)	(0.0005)	(0.0087)	(0.0004)	(0.0004)	(0.0085)	(0.0004)
COPD	-0.1279	0.0164	0.7003**	-0.0193	0.0428**	0.8518**	0.0023
	(0.0974)	(0.0169)	(0.3375)	(0.0153)	(0.0217)	(0.3465)	(0.0161)
Duration	-0.0819	0.0216	0.1821	0.0076	0.0042	0.0652	-0.0026
	(0.0576)	(0.0141)	(0.2335)	(0.0106)	(0.0146)	(0.3031)	(0.0113)
Duration^2	-0.0005	-0.0013***	-0.0134*	-0.0004	-0.0000	-0.0007	0.0001
	(0.0016)	(0.0004)	(0.0072)	(0.0003)	(0.0004)	(0.0095)	(0.0004)
Asthma	-0.2682	-0.0641*	-0.3714	-0.0421	0.0485	0.0581	0.0164
	(0.2190)	(0.0355)	(0.7277)	(0.0276)	(0.0396)	(0.7459)	(0.0277)
Duration	-0.0232	-0.0020	0.0580	-0.0051	0.0127*	0.1969*	0.0041
	(0.0267)	(0.0049)	(0.0866)	(0.0041)	(0.0075)	(0.1110)	(0.0047)
Duration^2	0.0007	0.0000	-0.0017	0.0001	-0.0004**	-0.0051**	-0.0001
	(0.0005)	(0.0001)	(0.0017)	(0.0001)	(0.0002)	(0.0023)	(0.0001)

Notes: Each model has been estimated as described in Section 2.4 by including a dummy for the health condition, a duration variables for how long the person has had the illness and the duration squared. The sample refers to the original 1996-2002 MEPS data where I exclude: (i) couples where both partners are disabled or (ii) retired or (iii) where at least one of the spouses is a student or (iv) where at least one of the spouses is less than 18 years old as described in Section 2.3.1, Tables 3 and 4. Robust clustered standard errors are in parentheses. * Significant at 10%; ** Significant at 5%; *** Significant at 1%

Table A14 – Estimates of the Effects of a Married Man's Health Condition on His and His Wife's Labor Market Decisions based on the Matched Samples with Oversampling of Low-Income People (years 1996-2004)

Husband's Health Condition	Husband's				Wife's			
	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
Cancer	-0.5957*	0.0215	0.4160	0.0143	0.7940***	0.0188	-0.4350	0.0693*
	(0.3127)	(0.0461)	(0.8077)	(0.0400)	(0.2042)	(0.0657)	(0.8955)	(0.0415)
Duration	-0.0738*	0.0089	0.0143	0.0081	0.0576*	0.0018	-0.0202	0.0055
	(0.0409)	(0.0071)	(0.1084)	(0.0064)	(0.0307)	(0.0091)	(0.1633)	(0.0046)
Severe Cancer	-0.9905***	0.0789	0.8381	0.0650	0.6645***	-0.0084	-0.6026	0.0507
	(0.3678)	(0.0493)	(0.9103)	(0.0473)	(0.2282)	(0.0755)	(1.0144)	(0.0467)
Duration	-0.1711***	0.0106	0.2650	0.0059	0.1155**	-0.0071	-0.0921	-0.0028
	(0.0642)	(0.0126)	(0.2235)	(0.0122)	(0.0503)	(0.0091)	(0.1440)	(0.0080)
Stroke	-3.4679***	0.0547	-2.1665	0.1140	1.1783*	0.1300	0.5751	0.0952
	(0.8994)	(0.1374)	(1.9986)	(0.1353)	(0.6785)	(0.1304)	(2.0239)	(0.0951)
Duration	-0.7407***	0.0115	-0.2230	0.0226	-0.0808	0.0098	0.3465	-0.0152
	(0.1372)	(0.0188)	(0.8725)	(0.0198)	(0.0788)	(0.0157)	(0.2505)	(0.0139)
Ischemic Heart Disease	-0.2274	-0.1737	-1.0007	-0.1472*	0.4112	-0.0478	0.2888	-0.0244
	(0.8708)	(0.1146)	(1.8607)	(0.0833)	(0.4613)	(0.1354)	(1.9018)	(0.1048)
Duration	-0.2024***	0.0033	-0.1714	0.0084	0.0206	0.0070	0.0802	-0.0007
	(0.0678)	(0.0097)	(0.1584)	(0.0078)	(0.0366)	(0.0098)	(0.1185)	(0.0080)
Emphysema	-3.9125***	-0.4738***	-1.1200	-0.4355***	-0.9368	0.2736	3.4885	0.0337
	(1.3579)	(0.1740)	(1.3129)	(0.1473)	(0.9093)	(0.2576)	(2.6345)	(0.2274)
Duration	-0.2011***	-0.0103	0.4938*	-0.0205**	-0.1540**	0.0013	0.3288	-0.0175*
	(0.0696)	(0.0097)	(0.2648)	(0.0098)	(0.0623)	(0.0127)	(0.2338)	(0.0097)
Chronic Bronchitis	0.3286	0.0013	-0.3796	0.0053	-0.2301**	0.0064	-0.0671	-0.0087
	(0.2126)	(0.0241)	(0.4048)	(0.0212)	(0.1114)	(0.0315)	(0.5241)	(0.0222)
Duration	-0.1205***	-0.0062	-0.2357**	0.0009	0.0074	-0.0094**	-0.0120	-0.0071**
	(0.0454)	(0.0070)	(0.0960)	(0.0066)	(0.0312)	(0.0044)	(0.0862)	(0.0030)
COPD	0.1817	0.0051	-0.3530	0.0080	-0.2376**	0.0114	-0.0672	-0.0034
	(0.2085)	(0.0242)	(0.4050)	(0.0210)	(0.1111)	(0.0317)	(0.5212)	(0.0225)
Duration	-0.1768***	-0.0066	-0.0799	-0.0036	-0.0466	-0.0067	0.0519	-0.0088***
	(0.0531)	(0.0061)	(0.1096)	(0.0059)	(0.0338)	(0.0047)	(0.0941)	(0.0033)
Asthma	1.0051**	-0.0248	-0.2987	-0.0088	-0.1179	0.0242	0.5787	-0.0181
	(0.5095)	(0.0521)	(1.0198)	(0.0403)	(0.2463)	(0.0671)	(1.2030)	(0.0476)
Duration	0.0154	0.0010	0.0063	0.0009	0.0236**	0.0012	-0.0083	0.0024
	(0.0227)	(0.0025)	(0.0463)	(0.0018)	(0.0117)	(0.0025)	(0.0389)	(0.0016)

Notes: The matched samples are the result of the application of the data matching algorithm described in Section 2.3.1 to the original sample. The original sample refers to the 1996-2004 MEPS data where panel 2, 7, 8 and 9 include also low income people. Robust clustered standard errors are in parentheses.

Table A15 – Estimates of the Effects of a Married Woman's Health Condition on Her and Her Husband's Labor Market Decisions based on the Matched Sample with Oversampling of Low-Income People (years 1996-2004)

Wife's Health Condition	Husband's				Wife's			
	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages	Labor Force Participation	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
Cancer	0.0083	0.0782**	0.7232	0.0553*	-0.0533	0.0291	-0.4828	0.0446*
	(0.1894)	(0.0323)	(0.5423)	(0.0303)	(0.1343)	(0.0404)	(0.6792)	(0.0265)
Duration	0.1624***	0.0013	0.0903	-0.0015	-0.0570	-0.0035	-0.1274	0.0009
	(0.0526)	(0.0068)	(0.1492)	(0.0051)	(0.0374)	(0.0095)	(0.1542)	(0.0064)
Severe Cancer	0.0395	0.0479	0.4477	0.0193	0.0126	0.0024	-0.1886	0.0188
	(0.2024)	(0.0335)	(0.5562)	(0.0306)	(0.1431)	(0.0420)	(0.7207)	(0.0271)
Duration	0.1447**	0.0040	0.0757	0.0002	-0.0116	-0.0035	-0.1323	0.0057
	(0.0580)	(0.0078)	(0.1642)	(0.0058)	(0.0492)	(0.0089)	(0.1613)	(0.0066)
Stroke	-0.9120	0.2698*	1.9143	0.2082	-1.9747	-0.3449	-5.7948*	0.0118
	(0.7828)	(0.1541)	(2.9840)	(0.1507)	(1.2592)	(0.3027)	(3.1926)	(0.1331)
Duration	-0.2845	-0.0247	-0.2538	-0.0218	-0.4386***	-0.0286	0.2456	-0.0287
	(0.2742)	(0.0249)	(0.5137)	(0.0195)	(0.1489)	(0.0914)	(1.4121)	(0.0532)
Ischemic Heart Disease	-0.4273	-0.0023	1.2902	-0.0514	-0.7609	0.1023	-2.4651	0.1300**
	(0.5549)	(0.1140)	(1.7835)	(0.1062)	(0.4762)	(0.0943)	(2.3206)	(0.0509)
Duration	0.0088	0.0159	0.1826	0.0076	-0.1686**	0.0339**	0.5317	0.0088
	(0.0621)	(0.0131)	(0.2342)	(0.0101)	(0.0685)	(0.0145)	(0.4007)	(0.0119)
Emphysema	0.6154	0.1026	14.0322	-0.2625	3.0193	-0.0721	7.5924***	-0.2990*
	(1.1481)	(0.2823)	(10.9632)	(0.1987)	(2.9516)	(0.1953)	(2.8526)	(0.1640)
Duration	-0.0845	-0.0067	-0.0269	-0.0052	0.1188	-0.0815***	-0.8938	-0.0474**
	(0.2343)	(0.0154)	(0.1897)	(0.0130)	(0.1533)	(0.0293)	(0.7197)	(0.0226)
Chronic Bronchitis	-0.0927	0.0236	0.7006*	0.0111	0.1799**	0.0724***	0.8690**	0.0412**
	(0.1190)	(0.0206)	(0.4053)	(0.0190)	(0.0900)	(0.0266)	(0.4249)	(0.0193)
Duration	-0.0440	-0.0020	0.0693	-0.0040	-0.0449	0.0021	0.0472	-0.0014
	(0.0327)	(0.0080)	(0.1635)	(0.0057)	(0.0386)	(0.0046)	(0.0997)	(0.0048)
COPD	-0.1022	0.0249	0.7229*	0.0135	0.1783**	0.0732***	0.9608**	0.0383**
	(0.1199)	(0.0206)	(0.4099)	(0.0192)	(0.0879)	(0.0265)	(0.4218)	(0.0194)
Duration	-0.0414	-0.0017	0.0556	-0.0033	-0.0345	-0.0018	0.0000	-0.0031
	(0.0320)	(0.0074)	(0.1468)	(0.0054)	(0.0401)	(0.0049)	(0.1012)	(0.0050)
Asthma	0.0144	-0.0825**	-1.0688	-0.0416	-0.2210	0.0178	0.7936	-0.0280
	(0.2623)	(0.0403)	(0.7210)	(0.0330)	(0.2006)	(0.0540)	(0.8447)	(0.0399)
Duration	0.0015	-0.0011	0.0011	-0.0013	-0.0077	-0.0051**	-0.0538	-0.0022
	(0.0098)	(0.0016)	(0.0275)	(0.0014)	(0.0109)	(0.0026)	(0.0376)	(0.0017)

Notes: See notes Table A15.

Table A16 – Estimated Coefficients of a Married Man's Health Condition on his Labor Market Decisions

Husband's Health Condition	*Dependent Variables*								
	Husband's Log Weekly Earnings[a]			**Husband's Weekly Hours of Work[b]**			**Husband's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cancer	-0.0541	-0.0465	-0.0454	-0.2413	0.1487	0.1700	-0.0383	-0.0634	-0.0644
	(0.0380)	(0.0560)	(0.0560)	(0.6490)	(0.9637)	(0.9628)	(0.0325)	(0.0483)	(0.0484)
Duration		0.0106	-0.0009		0.0136	0.0952		0.0073	-0.0110
		(0.0087)	(0.0196)		(0.1399)	(0.3067)		(0.0083)	(0.0179)
Duration^2			0.0005			-0.0035			0.0008*
			(0.0005)			(0.0072)			(0.0004)
Severe Cancer	-0.0110	0.0247	0.0252	0.2503	0.3716	0.3890	-0.0491	-0.0201	-0.0213
	(0.0456)	(0.0588)	(0.0587)	(0.7808)	(1.0171)	(1.0170)	(0.0412)	(0.0554)	(0.0556)
Duration		0.0093	0.0064		0.3013	0.1130		-0.0148	-0.0076
		(0.0176)	(0.0481)		(0.3258)	(0.8995)		(0.0177)	(0.0370)
Duration^2			0.0002			0.0142			-0.0005
			(0.0035)			(0.0754)			(0.0030)
Stroke	-0.0914	-0.0226	-0.0204	-1.4481	-2.4062	-2.2729	-0.0300	0.1217	0.1067
	(0.1359)	(0.1671)	(0.1680)	(1.7155)	(2.2471)	(2.2820)	(0.1329)	(0.1648)	(0.1644)
Duration		0.0132	-0.0807		-0.8679***	-1.0819		0.0823***	-0.0101
		(0.0203)	(0.0880)		(0.2020)	(1.7426)		(0.0257)	(0.0782)
Duration^2			0.0069			0.0158			0.0067
			(0.0055)			(0.1188)			(0.0045)
Ischemic Heart Disease	-0.0260	-0.2209*	-0.2460**	-0.6318	-1.2283	-0.9530	0.0028	-0.1116	-0.1637
	(0.0583)	(0.1236)	(0.1254)	(0.8784)	(1.2075)	(1.1980)	(0.0465)	(0.1150)	(0.1145)
Duration		-0.0230	0.0057		-0.4094*	-0.3211		0.0171	0.0397
		(0.0157)	(0.0384)		(0.2300)	(0.5439)		(0.0139)	(0.0302)
Duration^2			-0.0023			-0.0068			-0.0019
			(0.0025)			(0.0324)			(0.0020)
Emphysema	0.0184	-0.6661***	-0.6685***	2.0363	-4.6351**	-4.6529**	-0.2051*	-0.1688	-0.1771
	(0.0967)	(0.2363)	(0.2370)	(2.6094)	(2.3020)	(2.3234)	(0.1054)	(0.2112)	(0.2134)
Duration		-0.0123	-0.0359		0.6644**	0.4942		-0.0748***	-0.0942***
		(0.0132)	(0.0436)		(0.2602)	(1.2371)		(0.0150)	(0.0348)
Duration^2			0.0010			0.0075			0.0008
			(0.0015)			(0.0451)			(0.0012)

Table A16 – (Continued)

Husband's Health Condition	*Dependent Variables*								
	Husband's Log Weekly Earnings[a]			**Husband's Weekly Hours of Work[b]**			**Husband's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Chronic Bronchitis	-0.0055 (0.0296)	0.0101 (0.0309)	0.0092 (0.0309)	0.0171 (0.5323)	-0.2463 (0.5250)	-0.2370 (0.5256)	-0.0159 (0.0247)	0.0215 (0.0261)	0.0195 (0.0262)
Duration		-0.0108 (0.0116)	-0.0874*** (0.0223)		-0.2165* (0.1256)	-0.9392** (0.3780)		0.0088 (0.0103)	0.0083 (0.0274)
Duration^2			0.0022*** (0.0005)			0.0206** (0.0088)			0.0000 (0.0006)
COPD	0.0020 (0.0284)	0.0087 (0.0309)	0.0083 (0.0310)	0.1972 (0.5327)	-0.2508 (0.5246)	-0.2340 (0.5252)	-0.0285 (0.0243)	0.0183 (0.0261)	0.0157 (0.0261)
Duration		-0.0095 (0.0094)	-0.0587*** (0.0205)		-0.0379 (0.1397)	-0.0923 (0.4969)		-0.0074 (0.0092)	-0.0097 (0.0178)
Duration^2			0.0015*** (0.0005)			0.0014 (0.0115)			0.0013*** (0.0004)
Asthma	-0.0453 (0.0380)	-0.0336 (0.0642)	-0.0302 (0.0645)	0.0460 (0.7485)	1.1384 (1.3682)	1.1573 (1.3653)	-0.0414 (0.0318)	-0.1412*** (0.0521)	-0.1387*** (0.0530)
Duration		0.0012 (0.0024)	-0.0008 (0.0080)		0.0014 (0.0475)	0.1681 (0.1605)		0.0010 (0.0019)	-0.0141* (0.0078)
Duration^2			0.0000 (0.0002)			-0.0037 (0.0034)			0.0003** (0.0002)

Notes: Each model includes all the health conditions at the same time with the exception of COPD. Separate equations have been estimated for COPD, which include all the health conditions at the same time with the exception of emphysema and chronic bronchitis. "Duration" refers to the number of years that the individual has had a health condition. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition linearly; and Model 3 also includes a quadratic term of the duration of the health condition. Each model accounts for sample selection by including inverse Mills ratio for each round of interview *t*. Each model also includes dummy variables for the year and month of interview and dummy variables for husband's arthritis, back problems and mental illness. The sample is the matched sample of married men aged 18-64 with wives older than 18 described in Section 2.3.1, Table 6. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Other covariates include husband's and household characteristics; average weekly wages by county as listed in Table A5 in Appendix A.
[b] Other covariates include husband's and household characteristics and husband's predicted hourly wages as listed in Table A7 in Appendix A.
[c] Other covariates include husband's characteristics, average weekly wages by county and husband's predicted number of hours of work as listed in Table A9.

Table A17 –Effects of a Married Woman's Health Condition on her Labor Market Decisions

Wife's Health Condition	*Dependent Variables*								
	Wife's Log Weekly Earnings[a]			**Wife's Weekly Hours of Work[b]**			**Wife's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cancer	0.0026	0.0241	0.0272	-0.5402	-0.2999	-0.2877	0.0290	0.0222	0.0244
	(0.0403)	(0.0466)	(0.0465)	(0.6173)	(0.7574)	(0.7563)	(0.0265)	(0.0350)	(0.0351)
Duration		-0.0067	0.0326		-0.1537	-0.1844		0.0004	0.0266
		(0.0125)	(0.0354)		(0.2114)	(0.5453)		(0.0079)	(0.0210)
Duration^2			-0.0024			0.0013			-0.0016
			(0.0018)			(0.0299)			(0.0011)
Severe Cancer	0.0308	0.0257	0.0270	-0.1745	0.0355	0.0173	0.0354	0.0149	0.0175
	(0.0393)	(0.0478)	(0.0476)	(0.6527)	(0.7952)	(0.7935)	(0.0266)	(0.0357)	(0.0356)
Duration		-0.0030	0.0026		-0.1219	-0.8036		0.0036	0.0416
		(0.0120)	(0.0398)		(0.2225)	(0.5903)		(0.0088)	(0.0260)
Duration^2			-0.0004			0.0416			-0.0024
			(0.0022)			(0.0319)			(0.0015)
Stroke	-0.3383*	-0.6823	-0.6747	-0.1896	-9.2690*	-9.1870*	-0.2560**	0.0263	0.0278
	(0.1941)	(0.4546)	(0.4549)	(2.6017)	(4.8819)	(4.8966)	(0.1305)	(0.1909)	(0.1914)
Duration		-0.0078	0.2412		0.0954	0.9296		0.0001	0.2265*
		(0.0950)	(0.2302)		(1.4374)	(4.3981)		(0.0566)	(0.1231)
Duration^2			-0.0322			-0.0813			-0.0297**
			(0.0247)			(0.4644)			(0.0140)
Ischemic Heart Disease	-0.1026	0.0162	0.0159	-1.6329	-3.5429	-3.5429	-0.0550	0.1099**	0.1087**
	(0.0942)	(0.1045)	(0.1042)	(1.9406)	(2.8815)	(2.8815)	(0.0537)	(0.0524)	(0.0529)
Duration		0.0402**	-0.0457		0.6543	0.6543		-0.0144	-0.0862
		(0.0159)	(0.0933)		(1.6476)	(1.6476)		(0.0143)	(0.0533)
Duration^2			0.0059			0.0550			0.0050
			(0.0057)			(0.1038)			(0.0032)
Emphysema	-0.0326	-0.2062	-0.2184	1.9439	9.4654***	9.3434***	-0.0587	-0.5609***	-0.5637***
	(0.1717)	(0.2023)	(0.1975)	(4.9032)	(3.0434)	(3.0384)	(0.1064)	(0.1917)	(0.1889)
Duration		-0.0372	0.0217		-0.4813	-2.2124		-0.0291*	0.1047
		(0.0247)	(0.1754)		(0.8521)	(5.7337)		(0.0161)	(0.0748)
Duration^2			-0.0052			0.1391			-0.0113*
			(0.0136)			(0.4298)			(0.0062)

Table A17 – (Continued)

Wife's Health Condition	*Dependent Variables*								
	Wife's Log Weekly Earnings[a]			**Wife's Weekly Hours of Work[b]**			**Wife's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Chronic Bronchitis	0.0331	0.0460	0.0478	0.5854	1.0034*	0.9457*	0.0149	0.0092	0.0101
	(0.0305)	(0.0330)	(0.0328)	(0.5018)	(0.5179)	(0.5200)	(0.0219)	(0.0243)	(0.0242)
Duration		0.0052	0.0034		0.0258	0.0116		0.0013	0.0001
		(0.0050)	(0.0209)		(0.1161)	(0.4334)		(0.0050)	(0.0160)
Duration^2			0.0000			0.0011			0.0000
			(0.0006)			(0.0135)			(0.0006)
COPD	0.0342	0.0471	0.0491	0.4066	0.9138*	1.0324**	0.0097	0.0062	0.0073
	(0.0304)	(0.0329)	(0.0327)	(0.4928)	(0.5216)	(0.5166)	(0.0219)	(0.0244)	(0.0243)
Duration		0.0036	-0.0057		0.0635	0.0073		0.0010	-0.0090
		(0.0050)	(0.0201)		(0.1148)	(0.3903)		(0.0050)	(0.0152)
Duration^2			0.0003			0.0001			0.0003
			(0.0006)			(0.0122)			(0.0005)
Asthma	-0.0172	0.0659	0.0679	0.2707	0.2677	0.2630	-0.0320	0.0155	0.0171
	(0.0388)	(0.0573)	(0.0573)	(0.6218)	(1.0726)	(1.0741)	(0.0248)	(0.0395)	(0.0396)
Duration		-0.0038	0.0143		-0.0358	0.1957		-0.0015	0.0064
		(0.0033)	(0.0107)		(0.0456)	(0.1594)		(0.0022)	(0.0068)
Duration^2			-0.0004			-0.0051			-0.0002
			(0.0002)			(0.0034)			(0.0002)

Notes: Each model includes all the health conditions at the same time with the exception of COPD. Separate equations have been estimated for COPD, which include all the health conditions at the same time with the exception of emphysema and chronic bronchitis. "Duration" refers to the number of years that the individual has had a health condition. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition linearly; and Model 3 also includes a quadratic term of the duration of the health condition. Each model accounts for sample selection by including inverse Mills ratio for each round of interview *t*. Each model also includes dummy variables for the year and month of interview and dummy variables for wife's arthritis, back problems and mental illness. The sample is the matched sample of married women aged 18-64 with husbands older than 18 described in Section 2.3.1, Table 6. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Other covariates include wife's and household characteristics; average weekly wages by county as listed in Table A4 in Appendix A.

[b] Other covariates include wife's and household characteristics and wife's predicted hourly wages as listed in Table A10 in Appendix A.

[c] Other covariates include wife's characteristics, average weekly wages by county and wife's predicted number of hours of work as listed in Table A8.

Table A18 – Effects of a Married Man's Health Condition on his Wife's Labor Market Decisions

Husband's Health Condition	*Dependent Variables*								
	Wife's Log Weekly Earnings[a]			**Wife's Weekly Hours of Work[b]**			**Wife's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cancer	0.0522	0.0143	0.0157	0.3695	-0.6132	-0.6570	0.0307	0.0392	0.0428
	(0.0447)	(0.0665)	(0.0665)	(0.6755)	(1.1198)	(1.1152)	(0.0297)	(0.0470)	(0.0471)
Duration		0.0059	0.0072		0.1011	1.1547**		-0.0040	-0.0571**
		(0.0114)	(0.0369)		(0.1603)	(0.5159)		(0.0086)	(0.0273)
Duration^2			-0.0001			-0.0738**			0.0037**
			(0.0022)			(0.0307)			(0.0018)
Severe Cancer	0.0145	-0.0685	-0.0637	0.8262	-1.0479	-1.1013	-0.0191	0.0087	0.0154
	(0.0458)	(0.0728)	(0.0725)	(0.7516)	(1.1997)	(1.1972)	(0.0345)	(0.0526)	(0.0524)
Duration		-0.0037	-0.0421		0.0196	0.8544		-0.0054	-0.0749***
		(0.0116)	(0.0328)		(0.1912)	(0.5778)		(0.0118)	(0.0271)
Duration^2			0.0027			-0.0585*			0.0048***
			(0.0019)			(0.0341)			(0.0017)
Stroke	0.0998	0.1603	0.1631	-0.3168	-0.0164	0.0178	0.0927	0.1151	0.1152
	(0.1038)	(0.1969)	(0.1945)	(1.4576)	(2.2165)	(2.1899)	(0.0649)	(0.1425)	(0.1426)
Duration		0.0285	0.0545		0.5918	3.0977**		-0.0009	-0.0900*
		(0.0175)	(0.0804)		(0.3678)	(1.2821)		(0.0139)	(0.0535)
Duration^2			-0.0019			-0.1927**			0.0069*
			(0.0052)			(0.0809)			(0.0036)
Ischemic Heart Disease	-0.0053	0.0433	0.0381	0.7306	0.1972	0.1375	-0.0273	0.0648	0.0624
	(0.0699)	(0.1294)	(0.1296)	(0.9643)	(2.0811)	(2.0814)	(0.0502)	(0.0688)	(0.0690)
Duration		-0.0063	-0.0092		-0.0268	-0.2277		-0.0087	-0.0052
		(0.0135)	(0.0249)		(0.1447)	(0.3366)		(0.0114)	(0.0181)
Duration^2			0.0001			0.0071			-0.0001
			(0.0007)			(0.0109)			(0.0005)
Emphysema	-0.0948	0.0000	0.0000	1.3576	0.0000	0.2015	-0.1068*	-0.0517	-0.0274
	(0.1204)	(0.0000)	(0.0000)	(1.9033)	(0.0000)	(3.2730)	(0.0635)	(0.0791)	(0.1024)
Duration		0.0034	-0.0247		0.3166	0.0330		-0.0076	-0.0163
		(0.0171)	(0.0427)		(0.3010)	(0.7355)		(0.0127)	(0.0257)
Duration^2			0.0013			0.0122			0.0005
			(0.0014)			(0.0233)			(0.0007)

Table A18 – (Continued)

Husband's Health Condition	*Dependent Variables*								
	Wife's Log Weekly Earnings[a]			**Wife's Weekly Hours of Work[b]**			**Wife's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Chronic Bronchitis	0.0429	0.0371	0.0350	0.3030	0.2793	0.2728	0.0019	0.0032	0.0013
	(0.0328)	(0.0350)	(0.0351)	(0.5695)	(0.6282)	(0.6307)	(0.0250)	(0.0265)	(0.0266)
Duration		-0.0078**	-0.0149		0.0472	0.1091		-0.0092**	-0.0270
		(0.0038)	(0.0252)		(0.0841)	(0.3898)		(0.0036)	(0.0235)
Duration^2			0.0002			-0.0013			0.0005
			(0.0006)			(0.0092)			(0.0006)
COPD	0.0289	0.0378	0.0359	0.4066	0.2602	0.2510	-0.0056	0.0061	0.0041
	(0.0337)	(0.0352)	(0.0354)	(0.5759)	(0.6296)	(0.6324)	(0.0238)	(0.0267)	(0.0269)
Duration		-0.0051	-0.0155		0.1239	0.2907		-0.0087*	-0.0210
		(0.0055)	(0.0256)		(0.1115)	(0.4126)		(0.0045)	(0.0185)
Duration^2			0.0003			-0.0048			0.0004
			(0.0006)			(0.0098)			(0.0004)
Asthma	0.0215	-0.0262	-0.0291	-0.5770	-0.9725	-1.0011	0.0430	0.0137	0.0134
	(0.0459)	(0.0815)	(0.0816)	(0.7621)	(1.3536)	(1.3527)	(0.0322)	(0.0635)	(0.0636)
Duration		0.0042	-0.0115		0.0079	-0.2181		0.0051***	0.0006
		(0.0032)	(0.0073)		(0.0558)	(0.1416)		(0.0018)	(0.0052)
Duration^2			0.0003***			0.0045*			0.0001
			(0.0001)			(0.0026)			(0.0001)

Notes: Each model includes all the health conditions at the same time with the exception of COPD. Separate equations have been estimated for COPD, which include all the health conditions at the same time with the exception of emphysema and chronic bronchitis. "Duration" refers to the number of years that the individual has had a health condition. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition linearly; and Model 3 also includes a quadratic term of the duration of the health condition. Each model accounts for sample selection by including inverse Mills ratio for each round of interview *t*. Each model also includes dummy variables for the year and month of interview and dummy variables for husbands' arthritis, back problems and mental illness. The sample is the matched sample of married women aged 18-64 with husbands older than 18 described in Section 2.3.1, Table 9. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Other covariates include wife's and household characteristics; average weekly wages by county as listed in Table A4 in Appendix A.

[b] Other covariates include wife's and household characteristics and wife's predicted hourly wages as listed in Table A10 in Appendix A.

[c] Other covariates include wife's characteristics, average weekly wages by county and wife's predicted number of hours of work as listed in Table A8.

Table A19 – Effects of a Married Woman's Health Condition on her Husband's Labor Market Decisions

Wife's Health Condition	*Dependent Variables*								
	Husband's Log Weekly Earnings[a]			**Husband's Weekly Hours of Work[b]**			**Husband's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Cancer	0.0188	0.0527	0.0513	0.6457	0.3714	0.3655	-0.0249	0.0243	0.0223
	(0.0285)	(0.0414)	(0.0414)	(0.5212)	(0.7049)	(0.7039)	(0.0256)	(0.0369)	(0.0368)
Duration		0.0016	-0.0060		0.1341	-0.1710		-0.0050	0.0095
		(0.0086)	(0.0229)		(0.1932)	(0.4428)		(0.0066)	(0.0183)
Duration^2			0.0005			0.0197			-0.0009
			(0.0014)			(0.0287)			(0.0011)
Severe Cancer	-0.0123	0.0124	0.0114	0.4723	0.1785	0.1857	-0.0458*	-0.0012	-0.0036
	(0.0300)	(0.0426)	(0.0426)	(0.5589)	(0.7262)	(0.7252)	(0.0272)	(0.0383)	(0.0383)
Duration		-0.0002	-0.0063		0.0172	-0.1864		0.0025	0.0134
		(0.0095)	(0.0256)		(0.2134)	(0.4892)		(0.0068)	(0.0205)
Duration^2			0.0004			0.0130			-0.0007
			(0.0016)			(0.0305)			(0.0013)
Stroke	-0.0478	0.4650**	0.4605**	-1.7587	4.6065	4.5596	0.0613	0.1656	0.1536
	(0.0965)	(0.1834)	(0.1841)	(1.3283)	(4.6067)	(4.6011)	(0.0826)	(0.1995)	(0.2006)
Duration		-0.0245	0.0797		-0.0915	1.5971		-0.0242	-0.0525
		(0.0257)	(0.0898)		(0.4432)	(1.4277)		(0.0202)	(0.0852)
Duration^2			-0.0141			-0.2251			0.0036
			(0.0099)			(0.1860)			(0.0096)
Ischemic Heart Disease	-0.1163	-0.0440	-0.0404	0.7438	1.5249	1.6230	-0.1617***	-0.1556	-0.1616
	(0.0751)	(0.1364)	(0.1371)	(1.4471)	(1.9979)	(1.9852)	(0.0590)	(0.1358)	(0.1366)
Duration		0.0166	0.0212		0.3464	-1.1423		-0.0075	0.1012*
		(0.0257)	(0.0729)		(0.4603)	(1.2253)		(0.0185)	(0.0565)
Duration^2			-0.0003			0.1064			-0.0078**
			(0.0050)			(0.0903)			(0.0038)
Emphysema	0.1083	-0.5758***	-0.5662***	0.0040	-3.2913***	-3.1176***	0.0918	-0.3843***	-0.3772***
	(0.1149)	(0.0568)	(0.0551)	(2.0335)	(1.1393)	(1.1153)	(0.0875)	(0.0680)	(0.0656)
Duration		0.0053	0.0566		-0.1730	0.3103		0.0146	0.0408
		(0.0175)	(0.0712)		(0.2707)	(1.4017)		(0.0144)	(0.0402)
Duration^2			-0.0038			-0.0378			-0.0018
			(0.0045)			(0.0903)			(0.0027)

Table A19 – (continued)

Wife's Health Condition	*Dependent Variables*								
	Husband's Log Weekly Earnings[a]			**Husband's Weekly Hours of Work[b]**			**Husband's Log Hourly Wages[c]**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Chronic Bronchitis	-0.0069	0.0020	0.0020	0.4359	0.6817	0.6916	-0.0302	-0.0380	-0.0399*
	(0.0245)	(0.0254)	(0.0254)	(0.4719)	(0.5076)	(0.5070)	(0.0211)	(0.0232)	(0.0232)
Duration		-0.0137*	0.0019		-0.1501	0.0886		-0.0038	-0.0048
		(0.0072)	(0.0237)		(0.1053)	(0.4169)		(0.0059)	(0.0169)
Duration^2			-0.0006			-0.0092			0.0001
			(0.0007)			(0.0127)			(0.0005)
COPD	-0.0029	0.0004	0.0002	0.4545	0.6358	0.6425	-0.0276	-0.0363	-0.0381*
	(0.0243)	(0.0255)	(0.0255)	(0.4669)	(0.5083)	(0.5078)	(0.0210)	(0.0230)	(0.0230)
Duration		-0.0096	0.0174		-0.1251	0.2095		-0.0018	0.0022
		(0.0080)	(0.0192)		(0.1086)	(0.3367)		(0.0064)	(0.0145)
Duration^2			-0.0011*			-0.0139			-0.0001
			(0.0006)			(0.0104)			(0.0005)
Asthma	-0.0577*	-0.0853*	-0.0851*	0.4975	-0.3689	-0.3554	-0.0807***	-0.0550	-0.0544
	(0.0298)	(0.0511)	(0.0511)	(0.5695)	(1.0526)	(1.0531)	(0.0238)	(0.0399)	(0.0399)
Duration		-0.0004	-0.0027		-0.0164	0.0552		0.0002	-0.0055
		(0.0020)	(0.0070)		(0.0342)	(0.1243)		(0.0018)	(0.0058)
Duration^2			0.0001			-0.0016			0.0001
			(0.0002)			(0.0024)			(0.0001)

Notes: Each model includes all the health conditions at the same time with the exception of COPD. Separate equations have been estimated for COPD, which include all the health conditions at the same time with the exception of emphysema and chronic bronchitis. "Duration" refers to the number of years that the individual has had a health condition. Model 1 does not control for the duration of the health condition; Model 2 controls for the duration of the health condition linearly; and Model 3 also includes a quadratic term of the duration of the health condition. Each model accounts for sample selection by including inverse Mills ratio for each round of interview *t*. Each model also includes dummy variables for the year and month of interview and dummy variables for wives' arthritis, back problems and mental illness. The sample is the matched sample of married men aged 18-64 with wives older than 18 described in Section 2.3.1, Table 9. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] Other covariates include husband's and household characteristics; average weekly wages by county as listed in Table A3 in Appendix A.

[b] Other covariates include husband's and household characteristics and husband's predicted hourly wages as listed in Table A9 in Appendix A.

[c] Other covariates include husband's characteristics, average weekly wages by county and husband's predicted number of hours of work as listed in Table A7.

Appendix B - Auxiliary Tables for Chapter 3

Table B1 –Definition of Variables in Parents' Labor Force Participation, Earnings, Wages and Hours of Work Equations

Variable name	Definition
Children's Health	
Atleastone_asthma	Dummy =1 if there is at least one asthmatic child in the household; 0 otherwise
Atleastone_asthma05	Dummy =1 if there is at least one asthmatic child in the household in the age group 0-5; 0 otherwise
Atleastone_asthma611	Dummy =1 if there is at least one asthmatic child in the household in the age group 6-11; 0 otherwise
Atleastone_asthma1217	Dummy =1 if there is at least one asthmatic child in the household in the age group 12-17; 0 otherwise
Atleastone_severecondition	Dummy =1 if there is at least one child in the household with deformities, congenital anomalies, heart problems, epilepsy or cancer; 0 otherwise
Atleastone_severecondition05	Dummy =1 if there is at least one child in the household in the age group 0-5 and with deformities, congenital anomalies, heart problems, epilepsy or cancer; 0 otherwise
Atleastone_severecondition611	Dummy =1 if there is at least one child in the household in the age group 6-11 and with deformities, congenital anomalies, heart problems, epilepsy or cancer; 0 otherwise
Atleastone_severecondition1217	Dummy =1 if there is at least one child in the household in the age group 12-17 and with deformities, congenital anomalies, heart problems, epilepsy or cancer; 0 otherwise
Parent's Characteristics	
Age	Age of the parent
Age^2	Age of the parent squared
Age 18-24	Dummy = 1 if parent is in the age group 18-24; 0 otherwise
Age 25-34	Dummy = 1 if parent is in the age group 25-34; 0 otherwise
Age 35-44	Dummy = 1 if parent is in the age group 35-44; 0 otherwise
Age 45-54	Dummy = 1 if parent is in the age group 45-54; 0 otherwise
Age 55-64	Dummy = 1 if parent is in the age group 55-64; 0 otherwise
Age 65+	Dummy = 1 if parent older than 64; 0 otherwise
High-school degree	Dummy = 1 if parent has a high-school degree; 0 otherwise
Some college	Dummy = 1 if parent has some college; 0 otherwise
College	Dummy = 1 if parent has a college degree; 0 otherwise
Non-white	Dummy = 1 if parent is non-white; 0 otherwise
Hispanic	Dummy = 1 if parent is Hispanic; 0 otherwise
Served in the military	Dummy = 1 if parent served in the military; 0 otherwise
Single	Dummy = 1 if household has only one parent; 0 otherwise
Singleasthma	Dummy = 1 if parent is single and has at least one child with asthma
Singleasthma05	Dummy = 1 if parent is single and has at least one child with asthma in the age group 0-5
Singleasthma611	Dummy = 1 if parent is single and has at least one child with asthma in the age group 6-11
Singleasthma1217	Dummy = 1 if parent is single and has at least one child with asthma in the age group 12-17
Household Characteristics	
Numage05	Number of children in age group 0-5
Numage611	Number of children in age group 6-11
Numage1217	Number of children in age group 12-17
Transfinc	Transfer income / 1000
Notransfinc	Non-transfer income / 1000
Area Characteristics	
Non-MSA	Non metropolitan statistical area
Unemployment rate by county	Unemployment rate by county as percentage of the labor force
Wage by county	Average weekly wage by county/100

Table B2 – Definition of Children's Health Conditions

Health Condition	ICD-9 Code	Definition
Asthma	493	asthma
Cancer	140-149; 160; 230	cancer of head and neck
	150-151; 230	cancer of esophagus; of stomach
	153-154; 159	cancer of colon; of rectum and anus
	155	cancer of liver and intrahepatic bile duct
	157	cancer of pancreas
	152; 156; 158-159;162	cancer of other GI organs, peritoneum
	162; 231	cancer of bronchus, lung
	162-163;165	cancer, other respiratory and intrathoracic organs
	170-171	cancer of bone and connective tissue
	172	melanomas of skin
	173; 232	other non-epithelial cancer of skin
	174-175; 233	cancer of breast
	179-180; 182; 233; 795	cancer of uterus; of cervix
	27	cancer of ovary
	181;183-184	cancer of other female genital organ
	185-186;233	cancer of prostate; of testis
	188-189	cancer of bladder; of kidney and renal pelvis
	191-192	cancer of brain and nervous system
	193	cancer of thyroid
	201	hodgkin's disease
	200;202	non-hodgkin's lymphoma
	202-208	leukemias
	203	multiple myeloma
	164;190;194-195;234;795;	cancer, other and unspecified primary
	196-198	secondary malignancies
	199	malignant neoplasm without specification of site
	235-239	neoplasms of unspecified nature or uncertain behavior
Congenital Anomalies	213	Cardiac and circulatory congenital anomalies
	214	Digestive congenital anomalies
	215	Genitourinary congenital anomalies
	216	Nervous system congenital anomalies
	217	Other congenital anomalies
Deformities	342	Hemiplegia and hemiparesis
	343	Infantile cerebral paralysis
	734-736; 754	Acquired foot deformities
	735; 736	Other acquired deformities
	746; 754	Other bone disease and musculoskeletal deformities
	735; 736	acquired deformities of toe
	736; 755	other acquired limb deformities
	737; 738	curvature of spine
	738	other acquired deformity
	741; 756	Spina bifida
Epilepsy	345	Epilepsy
Heart Problems	424; 746	Heart valve disorders
	391; 422; 425; 674	Peri-; endo-; and myocarditis; cardiomyopathy
	410-412; 425	Acute myocardial infarction
	786	Nonspecific chest pain
	402; 415; 416; 428; 514; 518	Pulmonary heart disease
	404; 402; 428; 429	Other and ill-defined heart disease
	426	Conduction disorders
	427; 429; 785; 997	Cardiac dysrhythmias
	427; 429; 668; 799; 997	Cardiac arrest and ventricular fibrillation
	402, 404; 428	Congestive heart failure; nonhypertensive
	404; 410-414; 418	Other Chronic Ischemic Heart Disease
	101; 411; 413	Angina

Table B3 – Coefficients of Non-Health Variables in Mothers' Labor Force Participation Equation

	Model 1	Model 2
age_f	4.5962***	4.6916***
	(0.7199)	(0.7241)
age2_f	-0.5941***	-0.6048***
	(0.0975)	(0.0977)
highschdegree_f	1.3049***	1.3053***
	(0.1824)	(0.1831)
somecoll_f	2.0337***	2.0341***
	(0.2097)	(0.2103)
college_f	2.5866***	2.5894***
	(0.2589)	(0.2601)
nowhite_f	0.1083	0.1123
	(0.2051)	(0.2048)
hispanic_f	-0.9150***	-0.9026***
	(0.2126)	(0.2131)
age_m	-1.6528**	-1.7172**
	(0.8215)	(0.8255)
age2_m	0.2069**	0.2119**
	(0.1035)	(0.1038)
highschdegree_m	0.6620***	0.6512***
	(0.2359)	(0.2372)
somecoll_m	0.7609***	0.7521***
	(0.2600)	(0.2612)
college_m	-0.8001***	-0.8083***
	(0.2893)	(0.2909)
nowhite_m	1.0057***	1.0061***
	(0.2554)	(0.2556)
hispanic_m	0.1969	0.1837
	(0.2619)	(0.2630)
numage05	-0.7268***	-0.7229***
	(0.0716)	(0.0732)
numage611	-0.5253***	-0.5353***
	(0.0642)	(0.0663)
numage1217	-0.1422**	-0.1417*
	(0.0725)	(0.0753)
transfinc	-0.0513***	-0.0502***
	(0.0096)	(0.0096)
notransfinc	0.0081	0.0079
	(0.0105)	(0.0105)
didserve_f	0.0411	0.0381
	(0.5543)	(0.5619)
didserve_m	0.4239**	0.4335**
	(0.2116)	(0.2124)
nonmsa	0.2334	0.2282
	(0.1558)	(0.1562)
unemployrate	-0.0851***	-0.0834***
	(0.0218)	(0.0219)
wages by county	-0.0882**	-0.0862*
	(0.0442)	(0.0443)
single	-1.1734	-1.3423
	(1.6029)	(1.6134)

Table B3 – (continued)

Single*asthma_c	0.1009	
	(0.2112)	
singleseverecond_c	0.2328	
	(0.2890)	
atleastoneasthma_c	-0.0062	
	(0.1099)	
atleastoneseverecond_c	-0.2033	
	(0.1300)	
atleastone05asthma*single_c		0.2708
		(0.2996)
atleastone611asthma*single_c		-0.1230
		(0.2698)
atleastone1217asthma*single_c		-0.0640
		(0.3625)
atleastone05severcond*single_c		0.4515
		(0.4247)
atleastone611severcond*single_c		1.0930**
		(0.5363)
atleastone1217severcond*single_c		-0.3420
		(0.4492)
atleastone05asthma_c		-0.0168
		(0.1618)
atleastone611asthma_c		0.1135
		(0.1467)
atleastone1217asthma_c		-0.1277
		(0.1837)
atleastone05severcond_c		-0.3220
		(0.1988)
atleastone611severcond_c		-0.2862
		(0.1944)
atleastone1217severcond_c		0.1618
		(0.2060)
Constant	-2.0455	-2.0969
	(1.4886)	(1.4923)
Observations	16975	16975

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. *_f* denotes the mother and *_c* the child. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Other covariates include dummy variables for the year, and month of interview. The sample is the matched samples of mothers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. Table B1 in Appendix B presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table B4 – Coefficients of Non-Health Variables – Model 1- Mothers' Earnings, Hours of Work and Wages Equations

	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
Invmill1_f	-0.1469	-2.1668	0.2234***
	(0.1109)	(1.4869)	(0.0840)
Invmill2_f	-0.1734	-4.0209**	0.3212***
	(0.1181)	(1.5728)	(0.1020)
Invmill3_f	-0.2178*	-4.1503**	0.2839***
	(0.1190)	(1.6140)	(0.1034)
Invmill4_f	-0.2413*	-3.5392**	0.2253**
	(0.1241)	(1.7086)	(0.1004)
Invmill5_f	-0.2303*	-3.4667**	0.2359**
	(0.1215)	(1.6449)	(0.0983)
age_f	0.6162***	0.0700	0.5665***
	(0.1344)	(2.4522)	(0.0843)
age2_f	-0.0745***	-0.0594	-0.0676***
	(0.0183)	(0.3322)	(0.0114)
highschdegree_f	0.1225***		0.2441***
	(0.0399)		(0.0311)
somecoll_f	0.2557***		0.4669***
	(0.0514)		(0.0408)
college_f	0.6394***		0.7708***
	(0.0568)		(0.0373)
nowhite_f	0.0110	1.5321***	-0.0965***
	(0.0293)	(0.4865)	(0.0238)
hispanic_f	0.0082	2.1724***	-0.1759***
	(0.0334)	(0.5292)	(0.0343)
numage05	-0.0317	-1.2189***	
	(0.0257)	(0.4092)	
numage611	-0.0685***	-1.1286***	
	(0.0168)	(0.2876)	
numage1217	-0.0493***	-0.3458	
	(0.0174)	(0.2977)	
transfinc2	0.0064***	0.0500	
	(0.0023)	(0.0364)	
notransfinc2	0.0050	-0.0385	
	(0.0037)	(0.0574)	
single	-0.0455	1.2871**	-0.0757***
	(0.0361)	(0.5996)	(0.0262)

Table B4 – (continued)

	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
single	-0.0455	1.2871**	-0.0757***
	(0.0361)	(0.5996)	(0.0262)
single*asthma_c	-0.0258	-0.7066	-0.0042
	(0.0494)	(0.8339)	(0.0353)
singleseverecond_c	-0.1059	-0.5085	-0.0710
	(0.0665)	(1.0392)	(0.0512)
atleastoneasthma_c	0.0106	0.2588	-0.0208
	(0.0318)	(0.5236)	(0.0223)
atleastoneseverecond_c	0.0503	-0.1797	0.0176
	(0.0394)	(0.6748)	(0.0270)
wage by county	0.0538***		0.0687***
	(0.0096)		(0.0076)
wage_f		-0.3006	
		(0.9812)	
hour_f			0.0256***
			(0.0096)
Constant	4.3099***	38.3148***	-0.3780
	(0.2646)	(4.5845)	(0.4421)
Observations	10466	10466	10466

Notes: *_f* denotes the mother and *_c* the child. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Other covariates include dummy variables for the year, and month of interview. The sample is the matched samples of mothers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. Table B1 in Appendix B presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table B5 – Coefficients of Non-Health Variables – Model 2- Mothers' Earnings, Hours of Work and Wages Equations

	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
Invmill1_f	-0.1659	-2.2551	0.2140**
	(0.1070)	(1.4630)	(0.0846)
Invmill2_f	-0.1857	-4.2716***	0.3286***
	(0.1140)	(1.5263)	(0.1043)
Invmill3_f	-0.2316**	-4.4192***	0.2874***
	(0.1148)	(1.5502)	(0.1055)
Invmill4_f	-0.2694**	-3.9973**	0.2230**
	(0.1196)	(1.6682)	(0.1029)
Invmill5_f	-0.2490**	-3.6900**	0.2291**
	(0.1178)	(1.6090)	(0.0989)
age_f	0.5862***	-0.2879	0.5541***
	(0.1349)	(2.4588)	(0.0848)
age2_f	-0.0706***	-0.0105	-0.0657***
	(0.0183)	(0.3328)	(0.0115)
highschdegree_f	0.1176***		0.2434***
	(0.0393)		(0.0309)
somecoll_f	0.2494***		0.4655***
	(0.0504)		(0.0409)
college_f	0.6334***		0.7681***
	(0.0559)		(0.0374)
nowhite_f	0.0094	1.4760***	-0.0972***
	(0.0291)	(0.4847)	(0.0239)
hispanic_f	0.0080	2.1820***	-0.1780***
	(0.0334)	(0.5280)	(0.0351)
numage05	-0.0303	-1.2642***	
	(0.0257)	(0.4141)	
numage611	-0.0711***	-1.0708***	
	(0.0171)	(0.2972)	
numage1217	-0.0447**	-0.2727	
	(0.0189)	(0.3145)	
transfinc2	0.0064***	0.0503	
	(0.0023)	(0.0359)	
notransfinc2	0.0049	-0.0342	
	(0.0037)	(0.0577)	
single	-0.0501	1.3028**	-0.0841***
	(0.0354)	(0.5912)	(0.0261)
atleastone05asthma*single_c	-0.0660	-2.4686*	0.0641
	(0.0819)	(1.4048)	(0.0597)
atleastone611asthma*single_c	0.0081	0.3767	-0.0467
	(0.0628)	(1.0869)	(0.0446)
atleastone1217asthma*single_c	0.0110	-0.7196	0.0435
	(0.0758)	(1.2030)	(0.0567)
atleastone05severcond*single_c	-0.2853**	-2.5405	-0.1395
	(0.1360)	(1.6409)	(0.1286)
atleastone611severcond*single_c	-0.1573	-1.0146	-0.0764
	(0.0991)	(1.7015)	(0.0654)
atleastone1217severcond*single_c	-0.0201	0.1041	-0.0198
	(0.0916)	(1.5100)	(0.0688)
atleastone05asthma_c	0.0160	1.0285	-0.0200
	(0.0505)	(0.9517)	(0.0371)

Table B5 – (continued)

atleastone611asthma_c	0.0123	0.0597	-0.0080
	(0.0478)	(0.7672)	(0.0306)
atleastone1217asthma_c	-0.0033	-0.2018	-0.0257
	(0.0454)	(0.7375)	(0.0314)
atleastone05severcond_c	0.1185*	1.3775	-0.0080
	(0.0634)	(0.9959)	(0.0517)
atleastone611severcond_c	0.0884	-0.9861	0.1015**
	(0.0632)	(1.1230)	(0.0408)
atleastone1217severcond_c	-0.0024	-0.3243	-0.0203
	(0.0546)	(1.0405)	(0.0376)
annaww2	0.0537***		0.0692***
	(0.0096)		(0.0077)
lnw2hatc_f		-0.3532	
		(0.9796)	
hourhat2c_f2			0.0266***
			(0.0099)
Constant	4.3734***	39.0852***	-0.3953
	(0.2658)	(4.6218)	(0.4581)
Observations	10466	10466	10466

Notes: *_f* denotes the mother and *_c* the child. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Other covariates include dummy variables for the year, and month of interview. The sample is the matched samples of mothers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. Table B1 in Appendix B presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table B6 – Mothers with Partners' Hours of Work Conditional on Hours of Work of the Child's Father

Dependent Variable: **Mothers' Hours of Work**	**Fathers' Weekly Hours of Work < 40**		**Fathers' Weekly Hours of Work = 40**		**Fathers' Weekly Hours of Work > 40**	
Independent Variables						
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Asthmatic Child	-1.4565		0.6977		0.1666	
	(2.1909)		(0.6367)		(0.8915)	
Asthmatic Child Age 0-5		0.6028		2.2788**		-0.9755
		(2.8332)		(1.0671)		(1.6374)
Asthmatic Child Age 6-11		-5.9327*		-0.0028		0.7254
		(3.3196)		(0.8764)		(1.3846)
Asthmatic Child Age 12-17		-2.1293		-0.4874		0.9102
		(3.7157)		(0.9288)		(1.1621)
Child_Severe Health Condition	-2.9730		-0.4873		0.8924	
	(2.0578)		(0.8254)		(1.1813)	
Child_Severe Health Condition Age 0-5		-1.1451		0.8315		1.9650
		(2.0086)		(1.4157)		(1.7168)
Child_Severe Health Condition Age 6-11		-3.7958		-1.6241		-0.8000
		(3.3833)		(1.2081)		(1.8345)
Child_Severe Health Condition Age 12-17		-4.0517		-0.6965		2.3065
		(3.5948)		(1.3113)		(1.8656)
Number of Observations	404	404	3379	3379	2948	2948

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. The sample is the matched sample of mothers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B7 – Fathers with Partners' Hours of Work Conditional on Hours of Work of the Child's Mother

Dependent Variable: **Fathers' Hours of Work**	**Mothers' Weekly Hours of Work <40**		**Mothers' Weekly Hours of Work = 40**		**Mothers' Weekly Hours of Work > 40**	
Independent Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Asthmatic Child	0.4970		1.1834*		0.6894	
	(0.4328)		(0.6647)		(0.5315)	
Asthmatic Child Age 0-5		1.1536		2.1453**		1.8690
		(0.9957)		(1.0201)		(1.2577)
Asthmatic Child Age 6-11		0.0796		0.6111		-0.2185
		(0.3749)		(1.2290)		(0.9644)
Asthmatic Child Age 12-17		0.2062		0.1009		0.5548
		(0.5047)		(1.0087)		(0.7041)
Child_Severe Health Condition	1.1167		0.1037		0.6414	
	(0.7710)		(0.7348)		(0.7076)	
Child_Severe Health Condition Age 0-5		1.4426*		0.9530		-1.6074
		(0.8321)		(0.8410)		(1.0656)
Child_Severe Health Condition Age 6-11		1.7319		-0.0416		1.3115
		(1.6380)		(0.7221)		(0.8482)
Child_Severe Health Condition Age 12-17		0.3326		-0.4247		1.6762*
		(0.4832)		(1.3024)		(0.9022)
Number of Observations						

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. The sample is the matched sample of fathers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B8 – Coefficients of Non-Health Variables in Fathers' Earnings, Hours of Work and Wages Equations (Model 1)

	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
age_m	0.5933***	3.1048	0.3707***
	(0.1091)	(2.0645)	(0.1181)
age2_m	-0.0644***	-0.4914**	-0.0344**
	(0.0136)	(0.2500)	(0.0157)
highschdegree_m	0.1937***		0.0927**
	(0.0396)		(0.0435)
somecoll_m	0.2707***		0.2163***
	(0.0427)		(0.0382)
college_m	0.6274***		0.5233***
	(0.0527)		(0.0587)
nowhite_m	-0.1339***	-0.7102	-0.0679**
	(0.0303)	(0.7368)	(0.0346)
hispanic_m	-0.2622***	-0.9568	-0.2116***
	(0.0304)	(0.6366)	(0.0358)
numage05	-0.0005	-0.1998	
	(0.0098)	(0.2096)	
numage611	0.0065	0.0047	
	(0.0091)	(0.2163)	
numage1217	-0.0040	0.0705	
	(0.0083)	(0.2203)	
transfinc2	-0.0016	-0.0336	
	(0.0013)	(0.0246)	
notransfinc2	0.0022***	0.0183	
	(0.0008)	(0.0242)	
atleastone05asthma_c	-0.0020	1.1774***	-0.0490*
	(0.0208)	(0.4503)	(0.0289)
atleastone611asthma_c	0.0184	0.0378	0.0149
	(0.0150)	(0.4284)	(0.0133)
atleastone1217asthma_c	-0.0058	0.0206	-0.0093
	(0.0137)	(0.4389)	(0.0101)
atleastone05severcond_c	0.0026	0.0061	0.0058
	(0.0166)	(0.3546)	(0.0173)
atleastone611severcond_c	-0.0214	0.6383	-0.0426
	(0.0252)	(0.5279)	(0.0259)
atleastone1217severcond_c	0.0467**	0.4350	0.0182
	(0.0217)	(0.4520)	(0.0231)
Wage by county	0.0443***		0.0403***
	(0.0140)		(0.0117)
lnw2hatc_m		2.5019**	
		(1.1818)	
hourhat2c_m2			0.0240
			(0.0188)
Constant	4.7553***	32.4815***	0.4402
	(0.2086)	(4.1057)	(0.6820)
Observations	9211	9211	9211

Notes: *_f* denotes the mother and *_c* the child. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Other covariates include dummy variables for the year, and month of interview. The sample is the matched samples of fathers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. Table B1 in Appendix B presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table B9 – Coefficients of Non-Health Variables in Fathers' Earnings, Hours of Work and Wages Equations (Model 2)

	Log Weekly Earnings	Weekly Hours of Work	Log Hourly Wages
age_m	0.5849***	3.2845	0.3207***
	(0.1085)	(2.0586)	(0.1234)
age2_m	-0.0634***	-0.5166**	-0.0272
	(0.0136)	(0.2495)	(0.0166)
highschdegree_m	0.1949***		0.0767*
	(0.0395)		(0.0463)
somecoll_m	0.2719***		0.2089***
	(0.0426)		(0.0387)
college_m	0.6291***		0.5034***
	(0.0525)		(0.0619)
nowhite_m	-0.1335***	-0.6928	-0.0596*
	(0.0303)	(0.7374)	(0.0357)
hispanic_m	-0.2629***	-0.9599	-0.1995***
	(0.0304)	(0.6363)	(0.0379)
numage05	-0.0013	-0.1574	
	(0.0098)	(0.2089)	
numage611	0.0057	-0.0039	
	(0.0090)	(0.2122)	
numage1217	-0.0013	0.0407	
	(0.0082)	(0.2081)	
transfinc2	-0.0017	-0.0319	
	(0.0013)	(0.0245)	
notransfinc2	0.0022***	0.0180	
	(0.0008)	(0.0241)	
atleastoneasthma_c	0.0013	0.4923*	-0.0232*
	(0.0105)	(0.2947)	(0.0137)
atleastoneseverecond_c	0.0130	0.4198	-0.0091
	(0.0141)	(0.3335)	(0.0167)
annaww2	0.0448***		0.0401***
	(0.0141)		(0.0119)
lnw1hatc_m		2.4979**	
		(1.1765)	
hourhat1c_m2			0.0335
			(0.0207)
Constant	4.7679***	32.1539***	0.1227
	(0.2078)	(4.1181)	(0.7507)
Observations	9211	9211	9211

Notes: *_f* denotes the mother and *_c* the child. Each model accounts for sample selection by including inverse Mills ratio (*Invmill*) for each round of interview. Other covariates include dummy variables for the year, and month of interview. The sample is the matched samples of fathers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. Table B1 in Appendix B presents the definition of the variables. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table B10 – Effect of an Asthmatic Child on Mothers' Labor Decisions by Using the Non-matched Sample of Mothers

Mothers	*Dependent Variables*							
	Labor Force Participation[a]		**Log Weekly Earnings[b]**		**Weekly Hours of Work[c]**		**Log Hourly Wages[d]**	
Independent Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Asthmatic Child	0.0787		-0.0047		-0.3363		-0.0003	
	(0.0999)	(0.0999)	(0.0286)		(0.4694)		(0.0208)	
Asthmatic Child Age 0-5		0.1589		0.0208		0.5627		0.0064
		(0.1516)		(0.0484)		(0.9279)		(0.0354)
Asthmatic Child Age 6-11		0.1297		0.0016		-0.3909		0.0119
		(0.1387)		(0.0454)		(0.7203)		(0.0302)
Asthmatic Child Age 12-17		-0.1066		-0.0334		-0.8514		-0.0176
		(0.1675)		(0.0417)		(0.6760)		(0.0310)
Single*Asthmatic Child	-0.1950		-0.0037		0.2703		-0.0331	
		(0.1788)	(0.0432)		(0.7351)		(0.0314)	
Single*Asthmatic Child Age 0-5		-0.1054		-0.0458		-1.5127		0.0216
		(0.2639)		(0.0777)		(1.3281)		(0.0547)
Single*Asthmatic Child Age 6-11		-0.4190*		0.0288		1.5274		-0.0788*
		(0.2406)		(0.0593)		(1.0433)		(0.0441)
Single*Asthmatic Child Age 12-17		-0.1529		0.0215		-0.2629		0.0252
		(0.3161)		(0.0709)		(1.1363)		(0.0536)
Number of Observations	47,027	47,027	28,937	28,937	28,937	28,937	28,937	28,937

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. The sample is the non-matched sample of mothers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B11 – Effect of a Child with a Severe Chronic Health Condition on Mothers' Labor Market Decisions by Using the Non-matched Sample of Mothers

Mothers	*Dependent Variables*							
	Labor Force Participation[a]		**Log Weekly Earnings[b]**		**Weekly Hours of Work[c]**		**Log Hourly Wages[d]**	
Independent Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Child_Severe Health Condition	-0.2121*		0.0352		-0.6811		0.0364	
	(0.1210)		(0.0366)		(0.6388)		(0.0255)	
Child_Severe Health Condition Age 0-5		-0.3621*		0.1236**		1.0265		0.0245
		(0.1892)		(0.0617)		(0.9599)		(0.0492)
Child_Severe Health Condition Age 6-11		-0.3202*		0.0782		-1.4129		0.1171***
		(0.1861)		(0.0606)		(1.0844)		(0.0397)
Child_Severe Health Condition Age 12-17		0.1828		-0.0328		-0.9482		-0.0089
		(0.1943)		(0.0523)		(1.0171)		(0.0367)
Single*Child_Severe Health Condition	0.2404		-0.0837		0.3181		-0.0937**	
		(0.2628)	(0.0617)		(0.9569)		(0.0470)	
Single*Child_Severe Health Condition Age 0-5		0.3467		-0.2375*		-1.0451		-0.1772
		(0.3754)		(0.1278)		(1.5208)		(0.1170)
Single*Child_Severe Health Condition Age 6-11		0.6975		-0.1368		-0.0406		-0.1075*
		(0.4498)		(0.0955)		(1.6401)		(0.0614)
Single*Child_Severe Health Condition Age 12-17		-0.3179		-0.0050		0.5842		-0.0379
		(0.4300)		(0.0877)		(1.4619)		(0.0659)
Number of Observations	47,027	47,027	28,937	28,937	28,937	28,937	28,937	28,937

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. The sample is the non-matched sample of mothers aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B12 – Effect of an Asthmatic Child or Severely Ill Child on Fathers' Labor Market Decisions by Using the Non-matched Sample of Fathers

Fathers	*Dependent Variables*					
	Log Weekly Earnings		**Weekly Hours of Work**		**Log Hourly Wages**	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Independent Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Asthmatic Child	0.0051		0.4674*		-0.0167	
	(0.0095)		(0.2730)		(0.0109)	
Asthmatic Child Age 0-5		-0.0004		1.1220**		-0.0465*
		(0.0201)		(0.4403)		(0.0245)
Asthmatic Child Age 6-11		0.0237		0.0020		0.0167
		(0.0147)		(0.4125)		(0.0134)
Asthmatic Child Age 12-17		-0.0022		0.1240		-0.0092
		(0.0131)		(0.4149)		(0.0099)
Child_Severe Health Condition	0.0166		0.3929		-0.0034	
	(0.0137)		(0.3202)		(0.0148)	
Child_Severe Health Condition Age 0-5		0.0021		-0.0818		0.0089
		(0.0162)		(0.3422)		(0.0171)
Child_Severe Health Condition Age 6-11		-0.0166		0.5829		-0.0421*
		(0.0249)		(0.5100)		(0.0249)
Child_Severe Health Condition Age 12-17		0.0517**		0.5040		0.0189
		(0.0217)		(0.4258)		(0.0218)
Number of Observations	6,402	6,402	6,402	6,402	6,402	6,402

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. The sample is the non-matched sample of fathers with partners aged 18-64 described in Section 3.4. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B13 – Effect of an Asthmatic Child on Mothers' Labor Market Decisions by Using the Matched Sample of Mothers with Oversampling of Low Income People (years 1996-2004)

Mothers	*Dependent Variables*							
	Labor Force Participation[a]		**Log Weekly Earnings[b]**		**Weekly Hours of Work[c]**		**Log Hourly Wages[d]**	
Independent Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Asthmatic Child	0.1291		0.0112		-0.2813		0.0103	
	(0.0837)		(0.0255)		(0.4083)		(0.0178)	
Asthmatic Child Age 0-5		0.3473		0.0778**		0.8381		0.0465*
		(0.3182)		(0.0396)		(0.6900)		(0.0279)
Asthmatic Child Age 6-11		0.3579		-0.0234		-0.6934		-0.0076
		(0.3042)		(0.0365)		(0.5795)		(0.0243)
Asthmatic Child Age 12-17		-0.1062		-0.0056		-0.6871		-0.0031
		(0.3085)		(0.0364)		(0.6214)		(0.0256)
Single*Asthmatic Child	-0.2130		-0.0151		0.0246		-0.0197	
	(0.1431)		(0.0380)		(0.6429)		(0.0262)	
Single*Asthmatic Child Age 0-5		0.0557		-0.0701		-1.2723		-0.0290
		(0.1987)		(0.0574)		(1.0204)		(0.0400)
Single*Asthmatic Child Age 6-11		-0.4286**		0.0160		1.0614		-0.0363
		(0.1845)		(0.0497)		(0.8358)		(0.0354)
Single*Asthmatic Child Age 12-17		-0.3205		-0.0062		-0.5105		0.0363
		(0.2318)		(0.0588)		(1.0799)		(0.0420)
Number of Observations	7,141	7,141	17,972	17,972	17,972	17,972	17,972	17,972

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. The matched samples are the result of the application of the data matching algorithm described in Section 3.4 to the original sample. The original sample refers to the 1996-2004 MEPS data where panel 2, 7, 8 and 9 include also low income people. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B14 – Effect of a Child with a Severe Chronic Health Condition on Mothers' Labor Market Decisions by Using the Matched Sample of Mothers with Oversampling of Low Income People (years 1996-2004)

Mothers	*Dependent Variables*							
	Labor Force Participation[a]		**Log Weekly Earnings[b]**		**Weekly Hours of Work[c]**		**Log Hourly Wages[d]**	
Independent Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Child_Severe Health Condition	-0.2071**		0.0150		-0.3652		0.0318	
	(0.1028)		(0.0329)		(0.5295)		(0.0219)	
Child_Severe Health Condition Age 0-5		-0.4267***		0.0535		0.9168		0.0300
		(0.1590)		(0.0579)		(0.9018)		(0.0416)
Child_Severe Health Condition Age 6-11		-0.0584		0.0303		-1.1711		0.0623*
		(0.1468)		(0.0485)		(0.7898)		(0.0348)
Child_Severe Health Condition Age 12-17		-0.0687		-0.0427		-0.6037		-0.0118
		(0.1566)		(0.0523)		(0.8386)		(0.0347)
Single*Child_Severe Health Condition	0.2123		-0.0989*		-1.4452*		-0.0564	
	(0.2046)		(0.0541)		(0.8339)		(0.0395)	
Single*Child_Severe Health Condition Age 0-5		0.1037		-0.2352**		-3.0095**		-0.1434
		(0.1219)		(0.1030)		(1.4750)		(0.0885)
Single*Child_Severe Health Condition Age 6-11		0.2423**		-0.1607**		-2.3453*		-0.0644
		(0.1107)		(0.0812)		(1.3137)		(0.0539)
Single*Child_Severe Health Condition Age 12-17		0.0220		0.0325		-0.0425		0.0069
		(0.1355)		(0.0788)		(1.2079)		(0.0563)
Number of Observations	7,141	7,141	17,972	17,972	17,972	17,972	17,972	17,972

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. The matched samples are the result of the application of the data matching algorithm described in Section 3.4 to the original sample. The original sample refers to the 1996-2004 MEPS data where panel 2, 7, 8 and 9 include also low income people. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B15 – Effect of an Asthmatic Child on Fathers' Labor Market Decisions by Using the Matched Sample of Fathers with Oversampling of Low Income People (years 1996-2004)

Fathers	*Dependent Variables*					
	Log Weekly Earnings		**Weekly Hours of Work**		**Log Hourly Wages**	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Independent Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Asthmatic Child	-0.0104		0.4257**		-0.0184*	
	(0.0070)		(0.1882)		(0.0102)	
Asthmatic Child Age 0-5		-0.0153		0.8338***		-0.0254
		(0.0123)		(0.2808)		(0.0204)
Asthmatic Child Age 6-11		0.0090		0.2928		0.0064
		(0.0110)		(0.2937)		(0.0114)
Asthmatic Child Age 12-17		-0.0116		0.1373		-0.0178***
		(0.0097)		(0.2807)		(0.0068)
Child_Severe Health Condition	-0.0010		0.1793		-0.0049	
	(0.0108)		(0.2306)		(0.0104)	
Child_Severe Health Condition Age 0-5		-0.0191		-0.4235		-0.0081
		(0.0146)		(0.2908)		(0.0161)
Child_Severe Health Condition Age 6-11		-0.0174		0.2987		-0.0207
		(0.0166)		(0.3413)		(0.0158)
Child_Severe Health Condition Age 12-17		0.0266*		0.4752		0.0125
		(0.0154)		(0.3384)		(0.0176)
Number of Observations	3,861	3,861	3,861	3,861	3,861	3,861

Notes: Model 1 includes in the same equation a dummy variable for the presence of at least one asthmatic child and a dummy variable for the presence of at least one child with severe health conditions such as deformities, congenital anomalies, heart problems, epilepsy and cancer. Model 2 includes dummy variables of the child health conditions by age group. The matched samples are the result of the application of the data matching algorithm described in Section 3.4 to the original sample. The original sample refers to the 1996-2004 MEPS data where panel 2, 7, 8 and 9 include also low income people. Robust clustered standard errors are in parentheses. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.

Table B16 – Mothers' Labor Force Participation and School Days Lost by Using the Non-matched Sample of Mothers - Random Effects Probit

Independent Variables	Independent Variables' Definition[a]	Coefficients
	Child's Characteristics	
asthma	Dummy = 1 if the child has asthma; 0 otherwise	0.7188***
		(3.36)
severecond	Dummy = 1 if the child has a severe health condition; 0 otherwise	1.1433***
		(4.51)
age611	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.1317***
		(7.24)
age611single	*age611**Single mother	-0.1286***
		(3.65)
nonwhite	Dummy = 1 if the child is non-white; 0 otherwise	-0.3781***
		(17.92)
hispanic	Dummy = 1 if the child is non-Hispanic; 0 otherwise	-0.2048***
		(9.73)
firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.0122
		(0.61)
sibling	Dummy = 1 if the child has siblings; 0 otherwise	-0.1556***
		(6.26)
	Mothers' Characteristics	
part_f	Predicted probability of mothers' labor force participation	0.5407***
		(7.79)
asthmapart_f	*asthma*part_f*	-0.1697
		(0.76)
severecondpart_f	*severecond*part_f*	-0.8018***
		(3.04)
single	Dummy = 1 if the mother is single; 0 otherwise	0.0395
		(0.19)
partsingle_f	*part_f*single*	0.0391
		(0.19)
highsch_f	Dummy = 1 if the mother has a high-school degree; 0 otherwise	-0.1593
		(0.47)
somecoll_f	Dummy = 1 if the mother has some college; 0 otherwise	0.7377
		(1.57)
college_f	Dummy = 1 if the mother has a college degree; 0 otherwise	-0.3114
		(0.24)
highschpart_f	*highsch_f *part_f*	0.1720
		(0.50)
somecollpart_f	*somecoll_f*part_f*	-0.6527
		(1.38)
collpart_f	*college_f*part_f*	0.4190
		(0.33)
Constant	Constant	-1.0008***
		(14.48)
Number of Observations		60,374

Notes: The sample is the non-matched sample of children aged 6-17 described in Section 3.4. Standard errors are in parentheses. Other covariates include the percentage of household income from transfers and non-transfers; if the child lives in a non-metropolitan statistical area; dummy variables for the year and month of interview, and the recall period of the number of lost school days. The dependent variable is a dummy = 1 if the child has lost days of school; 0 otherwise. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B17 – Mothers' Labor Supply and School Days Lost by Using the Non-matched Sample of Mothers - Random Effects Probit

Independent Variables	Independent Variables' Definition[a]	Coefficients
	Child's Characteristics	
asthma	Dummy = 1 if the child has asthma; 0 otherwise	0.4149
		(0.58)
severecond	Dummy = 1 if the child has a severe health condition; 0 otherwise	0.5612
		(0.66)
age611	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.1487***
		(5.73)
age611single	*age611**Single mother	-0.1224***
		(2.71)
nonwhite	Dummy = 1 if the child is non-white; 0 otherwise	-0.3992***
		(14.40)
hispanic	Dummy = 1 if the child is non-Hispanic; 0 otherwise	-0.1968***
		(7.14)
firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.0083
		(0.31)
sibling	Dummy = 1 if the child has siblings; 0 otherwise	-0.1380***
		(4.63)
	Mothers' Characteristics	
hour_f	Mothers' predicted number of hours of work per week	0.0282**
		(2.57)
asthmahour_f	*asthma*hour_f*	0.0041
		(0.21)
severecondhour_f	*severecond*hour_f*	-0.0058
		(0.25)
single	Dummy = 1 if the mother is single; 0 otherwise	-0.0249
		(0.05)
hoursingle_f	*hour_f*single*	0.0012
		(0.09)
highsch_f	Dummy = 1 if the mother has a high-school degree; 0 otherwise	-0.1757
		(0.36)
somecoll_f	Dummy = 1 if the mother has some college; 0 otherwise	0.2387
		(0.45)
college_f	Dummy = 1 if the mother has a college degree; 0 otherwise	0.7219
		(1.30)
highschhour_f	*highsch_f *hour_f*	0.0078
		(0.60)
somecollhour_f	*somecoll_f*hour_f*	-0.0020
		(0.14)
collhour_f	*college_f*hour_f*	-0.1757
		(0.36)
Constant	Constant	-1.6428***
		(4.14)
Number of Observations		36,975

Notes: The sample is the non-matched sample of children aged 6-17 described in Section 3.4. Standard errors are in parentheses. Other covariates include the percentage of household income from transfers and non-transfers; if the child lives in a non-metropolitan statistical area; dummy variables for the year and month of interview, and the recall period of the number of lost school days. The dependent variable is a dummy = 1 if the child has lost days of school; 0 otherwise. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B18 – Mothers' Labor Force Participation and School Days Lost by Using the Matched Sample of Mothers with Oversampling of Low Income People - (years 1996-2004) - Random Effects Probit

Independent Variables	Independent Variables' Definition[a]	Coefficients
	Child's Characteristics	
asthma	Dummy = 1 if the child has asthma; 0 otherwise	0.7059***
		(5.31)
severecond	Dummy = 1 if the child has a severe health condition; 0 otherwise	0.6026***
		(4.33)
age611	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.1641***
		(7.69)
age611single	*age611**Single mother	-0.1307***
		(3.42)
nonwhite	Dummy = 1 if the child is non-white; 0 otherwise	-0.3576***
		(15.26)
hispanic	Dummy = 1 if the child is non-Hispanic; 0 otherwise	-0.1673***
		(7.03)
firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.0351
		(1.57)
sibling	Dummy = 1 if the child has siblings; 0 otherwise	-0.1247***
		(4.16)
	Mothers' Characteristics	
part_f	Predicted probability of mothers' labor force participation	0.5739***
		(8.48)
asthmapart_f	*asthma*part_f*	-0.2370*
		(1.70)
severecondpart_f	*severecond*part_f*	-0.2525*
		(1.71)
single	Dummy = 1 if the mother is single; 0 otherwise	-0.3201
		(1.61)
partsingle_f	*part_f*single*	0.3999**
		(2.02)
highsch_f	Dummy = 1 if the mother has a high-school degree; 0 otherwise	-0.2084
		(0.96)
somecoll_f	Dummy = 1 if the mother has some college; 0 otherwise	0.4901
		(1.20)
college_f	Dummy = 1 if the mother has a college degree; 0 otherwise	-1.0655*
		(1.92)
highschpart_f	*highsch_f *part_f*	0.1575
		(0.71)
somecollpart_f	*somecoll_f*part_f*	-0.4683
		(1.13)
collpart_f	*college_f*part_f*	1.1004**
		(1.97)
Constant	Constant	-1.1392***
		(16.08)
Number of Observations		44,089

Notes: The sample of children aged 6-17 is the result of the application of the data matching algorithm described in Section 3.4 to the original sample. The original sample refers to the 1996-2004 MEPS data where panel 2, 7, 8 and 9 include also low income people. Standard errors are in parentheses. Other covariates include the percentage of household income from transfers and non-transfers; if the child lives in a non-metropolitan statistical area; dummy variables for the year and month of interview, and the recall period of the number of lost school days. The dependent variable is a dummy = 1 if the child has lost days of school; 0 otherwise. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B19 – Mothers' Labor Supply and School Days Lost by Using the Matched Sample of Mothers with Oversampling of Low Income People – (years 1996-2004) - Random Effects Probit

Independent Variables	Independent Variables' Definition[a]	Coefficients
	Child's Characteristics	
asthma	Dummy = 1 if the child has asthma; 0 otherwise	-0.2703
		(0.47)
severecond	Dummy = 1 if the child has a severe health condition; 0 otherwise	-0.3701
		(0.50)
age611	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.1517***
		(4.73)
age611single	*age611**Single mother	-0.1492***
		(2.93)
nonwhite	Dummy = 1 if the child is non-white; 0 otherwise	-0.3640***
		(11.64)
hispanic	Dummy = 1 if the child is non-Hispanic; 0 otherwise	-0.1247***
		(4.11)
firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.0835***
		(2.79)
sibling	Dummy = 1 if the child has siblings; 0 otherwise	-0.0937***
		(2.61)
	Mothers' Characteristics	
hour_f	Mothers' predicted number of hours of work per week	0.0216
		(1.58)
asthmahour_f	*asthma*hour_f*	0.0200
		(1.31)
severecondhour_f	*severecond*hour_f*	0.0192
		(0.94)
single	Dummy = 1 if the mother is single; 0 otherwise	0.0305
		(0.06)
hoursingle_f	*hour_f*single*	0.0020
		(0.14)
highsch_f	Dummy = 1 if the mother has a high-school degree; 0 otherwise	0.9900*
		(1.80)
somecoll_f	Dummy = 1 if the mother has some college; 0 otherwise	1.9769***
		(3.25)
college_f	Dummy = 1 if the mother has a college degree; 0 otherwise	0.8444
		(1.29)
highschhour_f	*highsch_f *hour_f*	-0.0238
		(1.59)
somecollhour_f	*somecoll_f*hour_f*	-0.0479***
		(2.91)
collhour_f	*college_f*hour_f*	-0.0165
		(0.92)
Constant	Constant	-1.5955***
		(3.26)
Number of Observations		25,728

Notes: The sample of children aged 6-17 is the result of the application of the data matching algorithm described in Section 3.4 to the original sample. The original sample refers to the 1996-2004 MEPS data where panel 2, 7, 8 and 9 include also low income people. Other covariates include the percentage of household income from transfers and non-transfers; if the child lives in a non-metropolitan statistical area; dummy variables for the year and month of interview, and the recall period of the number of lost school days. The dependent variable is a dummy = 1 if the child has lost days of school; 0 otherwise. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

Table B20 – Mothers' Labor Force Participation and School Days Lost (Random Effects Negative Binomial and Random Effects Poisson)

Independent Variables	Independent Variables' Definition	**Random Effects Negative Binomial[a]** Coefficients	**Random Effects Poisson[b]** Coefficients
	Child's Characteristics		
asthma_c	Dummy = 1 if the child has asthma; 0 otherwise	1.0810***	1.1470***
		(4.55)	(4.86)
severcond_c	Dummy = 1 if the child has a severe health condition; 0 otherwise	1.0809***	1.7694***
		(4.08)	(6.75)
age611	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.1774***	-0.0045
		(5.44)	(0.14)
age611single	*age611**Single mother	-0.0254	-0.0826
		(0.41)	(1.39)
nonwhite_c	Dummy = 1 if the child is non-white; 0 otherwise	-0.5134***	-0.4243***
		(13.37)	(8.87)
hispanic_c	Dummy = 1 if the child is non-Hispanic; 0 otherwise	-0.2130***	-0.1771***
		(5.70)	(3.78)
firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.0457	0.0529
		(1.31)	(1.19)
sibling	Dummy = 1 if the child has siblings; 0 otherwise	-0.1497***	-0.0962*
		(3.23)	(1.79)
	Mothers' Characteristics		
part_f	Predicted probability of mothers' labor force participation	0.7720***	0.5891***
		(5.73)	(4.22)
asthmapart_f	*asthma*part_f*	-0.4418*	-0.5966**
		(1.80)	(2.46)
severcondpart_f	*severecond*part_f*	-0.6964**	-1.0038***
		(2.52)	(3.71)
single	Dummy = 1 if the mother is single; 0 otherwise	-0.5170	-0.6867*
		(1.32)	(1.94)
partsingle_f	*part_f*single*	0.5634	0.9398***
		(1.44)	(2.65)
highschdegree_f	Dummy = 1 if the mother has a high-school degree; 0 otherwise	0.6108*	0.5510
		(1.88)	(1.57)
somecoll_f	Dummy = 1 if the mother has some college; 0 otherwise	1.5063**	0.8473
		(2.39)	(1.30)
college_f	Dummy = 1 if the mother has a college degree; 0 otherwise	-0.3010	-1.2775*
		(0.28)	(1.79)
highschpart_f	*highsch_f *part_f*	-0.5818*	-0.6370*
		(1.73)	(1.77)
somecollpart_f	*somecoll_f*part_f*	-1.3599**	-0.9685
		(2.13)	(1.48)
collpart_f	*college_f*part_f*	0.4443	1.0104
		(0.41)	(1.40)
Constant	Constant	-0.6127***	-1.7125***
		(4.31)	(12.53)
Number of Observations		23,847	23,847

Notes: I use the sample of children with mothers aged 18-64 described in Section 3.4. Standard errors are in parentheses. Other covariates include the percentage of household income from transfers and non-transfers; if the child lives in a non-metropolitan statistical area; dummy variables for the year and month of interview, and the recall period of the number of days of school lost. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] [b] The dependent variable is the number of days of school lost by the child.

Table B21 – Mothers' Labor Force Participation, Asthmatic Children and Predicted Number of Days of School Lost (Random Effects Negative Binomial)

(A) Mothers with Partners and with College Degree				**(B) Mothers with Partners and with High-School Degree**			
White Children				*White Children*			
	P	NP	*[(P-NP)/NP]*100*		P	NP	*((P-NP)/NP)*100*
NA	0.9593	0.5236	*83.20*	NA	0.8557	0.7075	*20.94*
A	1.8178	0.8380	*116.93*	A	1.6215	2.0856	*-22.25*
*[(A-NA)/NA]*100*	*89.50*	*60.04*		*[(A-NA)/NA]*100*	*89.50*	*194.77*	
Non-white Children				*Non-white Children*			
	P	NP	*[(P-NP)/NP]*100*		P	NP	*[(P-NP)/NP]*100*
NA	0.5741	0.3134	*83.20*	NA	0.5121	0.4234	*20.94*
A	1.0879	0.5015	*116.93*	A	0.9704	1.2481	*-22.25*
*[(A-NA)/NA]*100*	*89.50*	*60.04*		*[(A-NA)/NA]*100*	*89.50*	*194.77*	
(C) Single Mothers with College Degree				**(D) Single Mothers with High-School Degree**			
White Children				*White Children*			
	P	NP	*[(P-NP)/NP]*100*		P	NP	*[(P-NP)/NP]*100*
NA	0.9797	0.1653	*492.79*	NA	0.8739	0.4113	*112.45*
A	1.8566	0.4872	*281.09*	A	1.6561	1.2125	*36.58*
*[(A-NA)/NA]*100*	*89.50*	*194.77*		*[(A-NA)/NA]*100*	*89.50*	*194.77*	
Non-white Children				*Non-white Children*			
	P	NP	*[(P-NP)/NP]*100*		P	NP	*[(P-NP)/NP]*100*
NA	0.5863	0.0989	*492.79*	NA	0.5230	0.2462	*112.45*
A	1.1111	0.2916	*281.09*	A	0.9911	0.7256	*36.58*
*[(A-NA)/NA]*100*	*89.50*	*194.77*		*[(A-NA)/NA]*100*	*89.50*	*194.77*	

Notes: Predicted school days lost have been calculated for a child in the age group 6-11, non-Hispanic, with siblings. I used the coefficients of the random effects negative binomial presented in the Table B24.

P = Mothers participate in the labor force.
NP = Mothers do not participate in the labor force.
A = Child has asthma.
NA = Child does not have asthma.

For example, [NA, NP] is the predicted number of days of school lost of a child without asthma with a mother that does not participate in the labor force. [(A-NA)/NA]*100 indicates the percentage change in the number of days of school lost between an asthmatic child and a non-asthmatic child. *[(P-NP)/NP]*100* indicates the percentage change in the number of days of school lost between a child whose mother participates in the labor force and a child whose mother does not participate in the labor force.

Table B22 – Mothers' Labor Force Participation, Severely Ill Children and Predicted Probabilities of School Days Lost (Random Effects Negative Binomial)

(A) Mothers with Partners and with College Degree				**(B) Mothers with Partners and with High-School Degree**			
White Children				*White Children*			
	P	NP	*[(P-NP)/NP]*100*		P	NP	*((P-NP)/NP)*100*
NSV	0.9593	0.5236	*83.20*	NSV	0.8557	0.7075	*20.94*
SV	1.4091	0.8379	*68.17*	SV	1.2569	2.0854	*-39.73*
*[(SV-NSV)/NSV]*100*	*46.89*	*60.02*		*[(SV-NSV)/NSV]*100*	*46.89*	*194.74*	
Non-white Children				*Non-white Children*			
	P	NP	*[(P-NP)/NP]*100*		P	NP	*[(P-NP)/NP]*100*
NSV	0.5741	0.3134	*83.20*	NSV	0.5121	0.4234	*20.94*
SV	0.8433	0.5014	*68.17*	SV	0.7522	1.2480	*-39.73*
*[(SV-NSV)/NSV]*100*	*46.89*	*60.02*		*[(SV-NSV)/NSV]*100*	*46.89*	*194.74*	
(C) Single Mothers with College Degree				**(D) Single Mothers with High-School Degree**			
White Children				*White Children*			
	P	NP	*[(P-NP)/NP]*100*		P	NP	*[(P-NP)/NP]*100*
NSV	0.9797	0.1653	*492.79*	NSV	0.8739	0.4113	*112.45*
SV	1.4391	0.4871	*195.43*	SV	1.2837	1.2124	*5.88*
*[(SV-NSV)/NSV]*100*	*46.89*	*194.74*		*[(SV-NSV)/NSV]*100*	*46.89*	*194.74*	
Non-white Children				*Non-white Children*			
	P	NP	*[(P-NP)/NP]*100*		P	NP	*[(P-NP)/NP]*100*
NSV	0.5863	0.0989	*492.79*	NSV	0.5230	0.2462	*112.45*
SV	0.8612	0.2915	*195.43*	SV	0.7682	0.7256	*5.88*
*[(SV-NSV)/NSV]*100*	*46.89*	*194.74*		*[(SV-NSV)/NSV]*100*	*46.89*	*194.74*	

Notes: Predicted school days lost have been calculated for a child in the age group 6-11, non-Hispanic, with siblings. I used the coefficients of the random effects negative binomial presented in the Table X.

P = Mothers participate in the labor force.
NP = Mothers do not participate in the labor force.
SV = Child has a severe condition, such as deformities, congenital anomalies, heart problems, epilepsy, cancer.
NSV = Child does not have a severe health condition.

For example, [NSV, NP] is the predicted number of days of school lost of a child without a severe health condition and with a mother that does not participate in the labor force. [(SV-NSV)/NSV]*100 indicates the percentage change in days of school lost between a severely ill child and a child non-severely ill. (P-NP) indicates the difference in the probability of losing days of school between a child whose mother participates in the labor force and a child whose mother does not participate in the labor force.

Table B23 – Mothers' Hours of Work and School Days Lost (Random Effects Negative Binomial and Random Effects Poisson)

Independent Variables	Independent Variables' Definition	**Random Effects Negative Binomial[a]** Coefficients	**Random Effects Poisson[b]** Coefficients
	Child's Characteristics		
asthma_c	Dummy = 1 if the child has asthma; 0 otherwise	-0.0144	-3.2460**
		(0.02)	(1.97)
severcond_c	Dummy = 1 if the child has a severe health condition; 0 otherwise	-0.6151	-0.2455
		(0.62)	(0.11)
age611	Dummy = 1 if the child is in the age group 6-11; 0 otherwise	0.2048***	0.1443
		(4.57)	(1.04)
age611single	*age611**Single mother	-0.0348	-0.0752
		(0.45)	(0.44)
nonwhite_c	Dummy = 1 if the child is non-white; 0 otherwise	-0.5283***	-0.6131***
		(10.63)	(5.92)
hispanic_c	Dummy = 1 if the child is non-Hispanic, 0 otherwise	-0.1255**	-0.1895*
		(2.51)	(1.74)
firstborn	Dummy = 1 if the child is the firstborn; 0 otherwise	0.0453	-0.0345
		(0.99)	(0.32)
sibling	Dummy = 1 if the child has siblings; 0 otherwise	-0.0901	-0.2435
		(1.61)	(1.47)
	Mothers' Characteristics		
hour_f	Mothers' Predicted number of hours of work per week	0.0677***	0.0804**
		(3.12)	(2.34)
asthmahour_f	*asthma*hour_f*	0.0176	0.1101**
		(0.79)	(2.48)
severcondhour_f	*severecond*hour_f*	0.0274	0.0118
		(1.02)	(0.19)
single	Dummy = 1 if the mother is single; 0 otherwise	0.4781	1.9600
		(0.58)	(1.29)
hoursingle_f	*hour_f*single*	-0.0146	-0.0526
		(0.68)	(1.29)
highschdegree_f	Dummy = 1 if the mother has a high-school degree; 0 otherwise	0.1377	0.9059
		(0.16)	(0.60)
somecoll_f	Dummy = 1 if the mother has some college; 0 otherwise	3.1625***	8.0824***
		(3.42)	(4.40)
college_f	Dummy = 1 if the mother has a college degree; 0 otherwise	2.2324**	0.1865
		(2.26)	(0.04)
highschhour_f	*highsch_f *hour_f*	0.0024	-0.0224
		(0.10)	(0.55)
somecollhour_f	*somecoll_f*hour_f*	-0.0766***	-0.2057***
		(3.06)	(4.16)
collhour_f	*college_f*hour_f*	-0.0526*	0.0033
		(1.95)	(0.03)
Constant	Constant	-3.6263***	-4.4950***
		(4.61)	(3.66)
Number of Observations		14,661	14,661

Notes: I use the sample of children with mothers aged 18-64 described in Section 3.4. Standard errors are in parentheses. Other covariates include the percentage of household income from transfers and non-transfers; if the child lives in a non-metropolitan statistical area; dummy variables for the year and month of interview, and the recall period of the number of days of school lost. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level

[a] [b] The dependent variable is the number of days of school lost by the child.

Table B24 – Mothers' Hours of Work Asthmatic Children and Predicted Number of Days of School Lost (Random Effects Negative Binomial)

(A) Mothers with Partners and with College Degree				**(B) Mothers with Partners and with High-School Degree**			
White Children				*White Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NA	8.2579	10.1815	-1.9236	NA	8.1302	7.5803	0.5499
A	15.8210	15.3127	0.5083	A	15.5765	14.2701	1.3064
(A-NA)	7.5632	5.1313		(A-NA)	7.4463	6.6898	
Non-white Children				*Non-white Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NA	4.8691	6.0033	-1.1342	NA	4.7938	4.4696	0.3242
A	9.3286	9.0289	0.2997	A	9.1844	8.4141	0.7703
(A-NA)	4.4595	3.0256		(A-NA)	4.3906	3.9445	
(C) Single Mothers with College Degree				**(D) Single Mothers with High-School Degree**			
White Children				*White Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NA	7.4034	7.3998	0.0036	NA	7.2890	6.8960	0.3930
A	14.1840	13.9303	0.2538	A	13.9648	12.9818	0.9830
(A-NA)	6.7806	6.5305		(A-NA)	6.6758	6.0858	
Non-white Children				*Non-white Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NA	4.3653	4.3632	0.0021	NA	4.2978	4.0661	0.2318
A	8.3634	8.2137	0.1496	A	8.2341	7.6545	0.5796
(A-NA)	3.9981	3.8506		(A-NA)	3.9363	3.5884	

Notes: Predicted school days lost have been calculated for a child in the age group 6-11, non-Hispanic, with siblings. I used the coefficients of the random effects negative binomial presented in the Table B27.

L = Mothers' average number of hours per week.
L+1 = increase of one hour of work per week.
A = Child has asthma.
NA = Child does not have asthma.

For example, [NA, L] is the predicted number of days of school lost of a child without asthma and with a mother that works about 37 hours per week. Marginal effect indicates the effect of one additional hour of work per week of the mother on the number of days of school lost by the child. It is the difference between (L+1) and L. (A-NA) gives the difference in the number of days of school lost between a child with asthma and a child without asthma.

Table B25 – Mothers' Hours of Work, Severely Ill Children and Predicted Number of Days of School Lost (Random Effects Negative Binomial)

(A) Mothers with Partners and with College Degree				**(B) Mothers with Partners and with High-School Degree**			
White Children				*White Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NSV	8.2579	10.1815	-1.9236	NSV	8.1302	7.5803	0.5499
SV	12.6064	12.0816	0.5248	SV	12.4116	11.2589	1.1526
(SV-NSV)	4.3485	1.9001		(SV-NSV)	4.2813	3.6786	
Non-white Children				*Non-white Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NSV	4.8691	6.0033	-1.1342	NSV	4.7938	4.4696	0.3242
SV	7.4331	7.1237	0.3095	SV	7.3182	6.6386	0.6796
(SV-NSV)	2.5640	1.1204		(SV-NSV)	2.5244	2.1690	
(C) Single Mothers with College Degree				**(D) Single Mothers with High-School Degree**			
White Children				*White Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NSV	7.4034	7.3998	0.0036	NSV	7.2890	6.8960	0.3930
SV	11.3020	10.9908	0.3112	SV	11.1273	10.2424	0.8849
(SV-NSV)	3.8986	3.5910		(SV-NSV)	3.8383	3.3465	
Non-white Children				*Non-white Children*			
	L+1	L	Marginal Effect		L+1	L	Marginal Effect
NSV	4.3653	4.3632	0.0021	NSV	4.2978	4.0661	0.2318
SV	6.6640	6.4805	0.1835	SV	6.5610	6.0393	0.5218
(SV-NSV)	2.2987	2.1174		(SV-NSV)	2.2632	1.9732	

Notes: Predicted school days lost have been calculated for a child in the age group 6-11, non-Hispanic, with siblings. I used the coefficients of the random effects negative binomial presented in the Table X.

L = Mothers' average number of hours per week.
L+1 = Increase of one hour of work per week.
SV = Child has a severe condition, such as deformities, congenital anomalies, heart problems, epilepsy, cancer.
NSV = Child does not have a severe health condition.

For example, [NA, L] is the predicted number of days of school lost of a child without asthma and with a mother that works about 37 hours per week. Marginal effect indicates the effect of one additional hour of work per week of the mother on the number of days of school lost by the child. It is the difference between (L+1) and L. (SV-NSV) gives the difference in the number of days of school lost between a child with asthma and a child without asthma.

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