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Elderly Health and Salaries in the Mexican Labor Market

by

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Abstract

Little work exists on elderly health, work and salaries in developing countries. This paper aims to contribute to this literature in the areas of health and income of the elderly. The main purpose of this paper is to investigate the determinants of elderly health in the context of a developing country -Mexico- and the relationship between these health indicators and earnings in the labor market. We analyze the determinants of elderly health in Mexico, considering a number of different measures of health status, and we use these indicators to evaluate the impact of health on the income of working elderly individuals. We use the National Mexican Aging Survey of 1994, which contains detailed self-reported indicators of health as well as labor market information, to tease out these potential relationships.

The results find that health measures have a strong negative effect on wages for male elderly workers. Our lowest point estimations demonstrate that poor health lowers hourly earnings by 58 percent. These are sizable effects, particularly within the context of a developing country, which does not have a universal social security system and may therefore imply that many elderly individuals work, whether or not their health level permits it. Poor health may also prevent others from working, and thereby contribute to high poverty rates among the elderly.

I. INTRODUCTION

One of the most important public policy issues both in developed and developing countries is the aging of the population. Aging of the population involves complex issues which range from health to pensions to the labor force. From the public policy perspective, the government needs to understand how and why health costs will change as a result of aging. Another critical issue in aging is related to pension systems with the need to analyze if the current structure of the pension system is financially viable and whether pension levels will be sufficient to finance retirement. Labor force analysis is critical as well, since aging may imply a reduction in the labor force, which could be exacerbated by pension systems if they promote early retirement.

All of these larger public policy questions require an understanding of how individuals behave as they confront the aging process. From the individual's perspective, aging and health may raise questions of uncertainty about health and its effect on daily activities, how to care for oneself in the event of illness and how to pay for these costs. In the case of labor force participation and retirement decisions, these decisions may reflect weighing the need to provide economic support for one's family, one's physical ability to continue working, and how the pension system rewards (or doesn't reward) previous years of participation.

In the context of developing countries and poverty, these questions may become even more pressing. Many developing countries may have limited social security systems (or none at all) which apply to workers only in the formal sector and provide pension levels insufficient to finance retirement. The more difficult economic situations and high rates of poverty may imply the need for labor force participation of the elderly at much higher rates in these countries and for longer periods of time. This in spite of the fact that the population in developing countries generally has poorer health than in developed countries and a much lower life expectancy (World Bank, 1994).

In spite of the importance of these issues, there is a very small literature on elderly health, labor force participation and retirement in the context of developing countries. This paper aims to fill this gap in the areas of health and income of the elderly. The main purpose of this paper is to investigate the determinants of the health of the elderly in the context of a developing country - Mexico- and the relationship between these health indicators and earnings in the labor market. We analyze the determinants of elderly health in Mexico, considering a number of different measures of health status, and we use these indicators to evaluate their impacts on the income of working elderly individuals. We use a recent dataset, the National Mexican Aging Survey of 1994, which contains detailed self-reported indicators of health as well as labor market information, to evaluate these potential relationships.

Our study applies recently developed models of health and wages to the elderly population in Mexico. A new literature has developed on the importance of health as a human capital investment and therefore as an important determinant of wages and economic growth. (Fogel, 1994). Empirical implementation of these models has focused on the possible endogeneity of health to productivity and wages. (Schultz, 1997, Thomas and Strauss, 1997). They emphasize that health indicators may be endogenous and/or subject to measurement error, which would have the impact of reducing the estimated impact of health on wages. This empirical problem thereby justifies the use of an instrumental variables technique to measure the effect of health on wages, which is expected to be negative among the working population.

Our paper also puts substantial emphasis on the determinants of elderly health. There have

been few studies on adult health status in developing countries and it is not clear that studies on developed countries necessarily apply in the developing country context. Existing health studies in developing countries have tended to focus more on the health and nutrition of children. Nevertheless, it has been shown that the relationship between child and adult mortality is not particularly close in many developing countries (Philips et. al, 1993), which justifies the study of adult health on its own. Because of the extent to which the population in most developing countries is aging at a much higher rate than in developing countries, Smith (1997) comments that "aging and health are the emerging policy issues in the Third World".

Mexico provides an interesting case study for aging. While still a relatively young country, it is beginning a process of rapid aging. Whereas the population growth rate for children is effectively zero and that for the working age population is now at about 2% and declining, the elderly population is growing at a rate of 4% annually. These trends imply that by the year 2030, the elderly population will quadruple in size.

The paper begins with a discussion of some of the relevant literature on aging, health, wages and labor supply. We provide descriptive information on the labor force participation and health status of the elderly in Mexico. We then present the theoretical model behind the empirical estimation and the data used for the analysis. The results on the determinants of elderly health status is next, followed by the instrumental variable estimation of the impacts of elderly health on wages. We close with a discussion of the implications of our results and suggestions for future research.

II. AGING AND HEALTH IN MEXICO

In this section, we examine recent trends in aging and health in Mexico. We also briefly discuss the actual state of health systems in Mexico.

Table 1 shows the drastic increases in life expectancy and declines in infant mortality which have occurred in Mexico since 1950. Education levels and other indicators of development, such as the percentage of households with running water have shown similar increases. The Mexican economy grew steadily between 1940 and 1980, with the gross national product more than tripling in these four decades. The table suggests the existence of a high correlation between health and economic growth, although health conditions continued to improve in the 1980s despite being a period of low economic growth.

Table 2 shows life expectancy in Mexico from 1930 onward. Life expectancy has increased dramatically in Mexico over the last half century, which in turn, is related to the steep declines in mortality which have occurred. For individuals born in 1930, life expectancy was approximately 35.5 years for men, and 37 years for women. (Gómez de Leon and Parker, 1998). This is largely a reflection of the decline in mortality rates; in 1930 death rates were 26 per 1000 inhabitants and by 1995 these had fallen to 4.4 deaths per 1000 inhabitants[1].

Nevertheless, it should be emphasized that while substantial progress has been made in these indicators, overall levels are still considered to be low, given Mexico´s level of GDP per-capita. Given its average income level, Mexico fairs slightly worse in life expectancy than other Latin American

[1] This is of interest to our analysis, given that the individuals in our sample are all 60 years and older (that is they were born in 1934 or earlier), which implies they are a group in which the majority of which has lived to an age double their life expectancy at birth., implying a strong sample selection of this group. See Strauss et al. 1993 for an analysis of how selection by death, that is, that the least healthy are likely to die earlier, may affect the estimated determinants of health in a population.

countries and additionally, Latin America fairs worse on average than other regions, given its average level of income (Banco Interamericano de Desarrollo, 1996).

While still a relatively young country, Mexico's elderly population is expected to grow at an increasing rate. The number of individuals 65 and older represented 4.16 percent of the population in 1990, but this is expected to almost double by the year 2020 (to 7.26%) (Instituto Nacional de Estadística y Geografía, 1993).

Participation of the elderly in the labor market is relatively high in Mexico for men (at 43.5% in 1994 versus 15% for the population 65 and over in the United States). It is, however, quite low for women. This may not be surprising because female labor force participation in Mexico is much lower than participation in more developed countries[2].

As in many other countries, the labor force participation rate of the elderly in Mexico has been decreasing overtime. The labor force participation rate for men age 60 and over fell from 72.1 percent in 1970 to 53.3 percent in 1990. For elderly women, the labor force participation rate also fell from 12.6 percent in 1970 to 6.7 percent in 1990[3] (INEGI, 1993).

Health in Mexico

As Table 1 demonstrated, overall health in Mexico has been improving sharply. Nevertheless, these health improvements are not distributed equally between poorer and richer groups. The prevalence of acute diseases is highest among the poorest subgroups of the population (Lozano et al. 1993), which tend to be those living in rural areas, those living in dwellings in poor conditions, those with large numbers living in the same dwelling, and those with heads of households with low educational status. The main causes of death among the rural poor are infections and malnutrition, while chronic and degenerative diseases and injuries are the most common causes of death in the more wealthy urban population. (Mexican National Academy of Medicine, 1992).

The health care system in Mexico has a public-sector orientation, with the underlying philosophy that individuals and households should be protected by the public sector. However, the health system does have both public and private services. The public sector includes institutions that provide health care for the population working outside the formal sectors of employment and those who are uninsured. These institutions are the Ministry of Health (SSA), the National Institutes of Health, the Social Security System (IMSS) Solidarity Program, the National System for Integral Family Development (DIF) and the Health Services of the Federal District Department (DDF). There are also several social security systems in Mexico run by the public sector, which include the Mexican Institute of Social Security (IMSS), the Institute of Social Security and Services for State Workers (ISSSTE), the Armed Forces Social Security (ISSFAM) and the Mexican Oil Workers social security (PEMEX), as well as other health services for state and federal government employees. On the other hand, the private sector includes a variety of individuals and institutions working in a range of traditional and alternative medicine, mobile units, hospitals and clinics, private practices and private medical insurance. In 1995, almost half of the Mexican population was covered by a public social security institution, 40 percent was covered by institutions for the non-insured, 5 percent used private services, and 11 percent had no access to the health system's facilities (Secretaría de Salud, 1995).

[2] It may also reflect, however, that women have a lower health status than men (assuming that health has a negative impact on the probability of participating in the labor market).

[3] The fall in elderly female labor force participation is particularly notable given that female labor force participation increased tremendously over the period 1970 to 1993 from 17% to 33%. (Gregory, 1986) and INEGI, 1993.

III. THE DETERMINANTS OF ADULT AND ELDERLY HEALTH, PRODUCTIVITY AND LABOR SUPPLY: PREVIOUS LITERATURE

III A. Old age, labor supply and productivity

The labor market participation of the elderly varies enormously depending on the country and cultural context. Clark and Anker (1993) analyze the labor force participation of the elderly in 151 countries, concluding that participation rates for individuals 55 and over are much higher in developing countries, including Latin America, than in more developed countries. The differences are particularly large between men in developed countries and men in developing countries, as might be expected given that developed countries generally have less developed social security systems, and even those countries with social security systems generally have lower level of pensions, thereby implying that work remains necessary longer.

There are few studies which analyze the wage profiles of the elderly, as most studies of wages exclude the elderly from their analysis. An exception is Johnson and Neumark (1996) who estimate the relationship between aging and wages for older men in the United States, testing the human capital theory developed by Becker, in which human capital is expected to depreciate with age, thereby resulting in declines in productivity and wages. They find that wage declines appear to begin for workers in their 60s, but they stress that the declines may be related to interactions with Social Security. That is, workers shift from full-time to part-time work when they start to receive benefits and this results in lower reported wages. They emphasize that the sample of workers not eligible for Social Security demonstrate even weaker evidence that wages decline at older ages.

Posner (1995) emphasizes that there are different productivity profiles for the elderly, depending on their occupations. Profiles vary across occupations by the age of peak earnings and whether or not that peak is sustained. For instance, he notes that occupations such as painting are characterized by early but sustained peaks, whereas corporate management have late peaks which are not sustained. However, he claims that most studies of the issue of age and productivity do not find age-related declines in productivity. (Posner, 1995). He argues that this is partially due to the fact that most individuals do not use all of their physical and mental capabilities to do their job and therefore "it may be many years before the ...ability to do his job declines to a point at which he either cannot do it at all or cannot do it without a costly (to him) increment of effort. Until that point is reached, he may be able to compensate for diminution in occupationally relevant capabilities with small increases in effort."Posner also comments that the elderly are less likely to change jobs and that they may be more careful on the job, as they are aware that leaving the job would be very costly in terms of benefits they have built up (such as pensions) and that it would be more difficult to find a new job at their age.

III.B. Retirement, labor supply decisions and health

For elderly individuals, the decision to work is generally considered the same as the decision not to retire. Nevertheless, retirement is notoriously difficult to define and is likely to be a more ambiguous concept in a country such as Mexico where a very low percentage of the population receives a pension from Social Security. In our elderly sample, for instance, only 12 percent report receiving a pension, and a large fraction remain outside Social Security[4]. Additionally, a significant percentage of the population receiving pensions (18% as compared with 30% without pensions) report working in the previous week, indicating that retirement is not an all

[4] The recent reform in pensions at the Mexican Social Security Institute should eventually increase the percentage of individuals with pensions.

or nothing condition.

A large literature exists on estimating the impacts of health on work and retirement decisions of the elderly in the United States and other developed countries, although fewer analyze the impact of health on wages. Most of these studies find that health status is a significant predictor of retirement. Many of the earlier studies assumed that health was exogenous to retirement decisions, and simply included a measure of individual health on the right hand side of the model. More recent studies (Bound, 1992 and Stern, 1989) have considered health to be potentially endogenous to labor supply and have proposed corrective models. Studies have also discussed potential problems with self-assessed health indicators, because individuals may be more likely to report health reasons as their motivation for retiring than other less stigmatized reasons. Even worse, many self-assessed indicators of health are measured in terms of the ability to work which clearly make them endogenous to a labor supply model.

The theoretical impact of health on work and retirement decisions is, in general, ambiguous. Increases in health status may be expected to increase potential wage offers, but the income and substitution effects of this increase will work in opposite directions. Income effects will tend to reduce the amount of labor supply while substitution effects will tend to increase it. Nevertheless, (good) health may have its own effect, independent of wages, which would be expected to increase the labor supply of individuals.

This paper will focus more attention on the relationship between health and wages than on health and labor supply. Nevertheless, we analyze the labor force participation decisions of the elderly in order to correct for potential selection bias in our wage equations. We hypothesize that sample selection may be an important factor because the elderly who work may not be a representative sample of all elderly. Consequently, our wage equation estimations would be biased unless a correction is included.

III. C. What are good measures of health and disability in older individuals?

The success of our study depends critically on the extent to which the variables used to measure health status actually reflect the health of the individual. There exists a fairly extensive literature on measuring health among the elderly population in the epidemiological literature in developed countries, particularly in the United States. Much of it emphasizes the Activities of Daily Living (ADL) as an indicator of health status among the elderly. An example is Dunlop et al., 1997 who analyzes measures of disability and physical functioning of the elderly in order to define a hierarchy in terms of the disabilities which set in with old age. They argue that a person's ability to perform basic tasks of daily living is an indicator of morbidity and a significant predictor of use of health services. She also concludes that while women live longer than men, they spend more time disabled. Clark (1997) measures chronic disability in his study of whites and blacks in the United States as the inability to perform one of six activities of daily living for at least 3 months without assistance. While these indicators appear to be widely accepted in the United States and other developing countries as measures of elderly health, there is little evidence on their validity in developing countries.[5]

Another set of indicators are derived by asking the respondent to evaluate their own health.

[5] An exception is Strauss, et. al, (1993), who examine the patterns and determinants of adult health in four different countries. They uniformly find that women display more problems and at earlier ages than men. They use measures of self-reported health as well as physical functioning measure. While they generally find strong effects of education on health, the positive effect of education is eliminated at older ages. They also find strong geographical differences although their paper does not examine the underlying reasons for these results; for instance, whether they are related to community health measures.

These indicators have in some cases been show to be more accurate indicators of mortality than clinical examinations (Schultz and Tansel, 1997). In the literature on labor supply and retirement substantial disagreement exists as to whether self-reported health measures produce more accurate estimates of the impact of health on labor supply than more objective measures of health (Bound, 1992). The main concern is that self-reported indicators of health may be biased if individuals who do not work are more likely to report health problems. This may result if individuals feel it is only socially acceptable to be retired if they have health problems, or if they believe there may be some financial impact of not declaring a disability when, as generally in the case of early retirement, it is necessary to show some disability for eligibility.[6]

An alternative measure of adult health is proposed by Schultz and Tansel (1997) within the context of two developing countries in Africa. They use number of days disabled as an indicator of morbidity to estimate the impact of health on wages and labor supply and find an important significant negative effect of health both on wages and labor supply.

The present study analyzes all of the above health indicators. This has the advantage that it will permit us to analyze how our results would vary depending on the choice of indicator. If all the health indicators show consistent results, it suggests that the different indicators are all measuring some common degree of the individual's health status.

IV. THEORETICAL AND EMPIRICAL FRAMEWORK

This paper applies a model of health production and productivity in an integrated human capital framework following Schultz (1996) and Schultz and Tansel (1997). Cumulative health status is produced over the individual's lifetime and begins with parents' and own investments in nutrition, disease-preventing interventions and practices, and in health conserving behaviors. These health inputs (HI), and heterogeneous endowments of the individual (G) unaffected by family or individual behavior combine to determine the individual's cumulative health status (h*).

$$h^* = h^* (HI, G, e) \qquad (1)$$

Since health status is self-reported, it may differ from actual health status by a measurement error ε,

$$H = h^* + \varepsilon \qquad (2)$$

where ε is assumed to be a random variable uncorrelated with other determinants of health.

The individual maximizes a single period utility function over a lifetime that includes health, the non-health-related consumption bundle and annual time allocated to non-wage activities, subject to the budget, time and health production constraints.

The individual's hourly wage is a function of cumulative health status (h*), other reproducible forms of human capital such as education, experience and migration (C), the vector of exogenous variables (X) that are included additively, and other unobserved forms of human capital transfers and genetic endowments.

$$W_i = W_i (h^*, X, C, y) \qquad (3)$$

[6] This may be less of a problem in the Mexican case, given that all of the health questions are asked under a separate section entitled health, and none of them are explicitly related to work behavior of the elderly.

The econometric strategy addresses the possibleendogeneity of health status to wages. The wage function is identified by the exclusion of community health variables (prices are not available), and the associated labor force participation equation by the exclusion of family wealth (proxied by characteristics of the home) and life cycle measures (number of living sons and daughters and marital status).

We are unable to directly estimate the health production function in equation (1) because many potentially relevant health inputs that have accumulated over the course of a lifetime are unavailable, as well as the prices of these inputs. Rather, we estimate reduced form health equations of our health status measures as the first stage our wage estimations, as follows:

$$H_i = g + h_j O_{ji} + r_k P_{ki} + t_i \qquad (4)$$

where O represents the vector of individual and family education, wealth, and resource opportunities and P represents the vector of community health infrastructure variables for individual i.

The empirical specification of the wage equation is given as follows:

$$W_i = a + b_j H_{ij} + c_k X_{ki} + d_h C_{hi} + f_i \qquad (5)$$

where H represents health status indicators, X represents the vector of exogenous endowments such as age and sex, which are not modified by the individual or his/her family, C represents the vector of reproducible forms of human capital, including years of schooling and migration, that can be increased by the investment of time and resources. As wages are only observed when the elderly individual participates in the labor market, we estimate the probability of participating with a probit model, which is then used to correct the wage equation (5).

There are at least two reasons why wethink that an instrumental variables approach to health status measures and wages are necessary. First, health for the elderly represents a lifetime of accumulated decisions and investments which are jointly determined with their productivity. It is likely that previous earnings and labor supply have affected to a certain degree the actual health status of the elderly. Second, the problem of inaccurate and incorrect answers, that is present in all surveys, may be even worse among the elderly, despite efforts to establish the individual's capacity to answer questions which take place at the beginning of the interview.

We use two variables to identify the impact of health on wages. The first variable is the number of hospital beds per-capita in the municipality where the elderly individual resides. We expect this variable to be positively related to health status. The second variable we use as an instrument is the percentage of households in the community of residence which have an earth (dirt) floor. This variable is associated with poverty and living conditions which are expected to have a negative effect on health status.

V. DATA

The paper uses the 1994 National Mexican Aging Survey. This nationally representative dataset carried out interviews of households in which at least one individual living in the household was age 60 or older. The questionnaire includes health, economic, and socio-demographic information as well as support networks. The health information is particularly useful for the analysis, as it permits a number of different health indicators to be constructed. The survey includes information on sick days, hospital days and accident days as well as questions based on the activities of daily living (ADL), self-reported health status measures (how would you rate your

health? how does it compare to other individuals your age?) and finally disability measures. The total sample size is 5,159 individuals. For the analysis we use individuals aged 60 to 79 years old, which leaves us with a sample of 4358 elderly individuals. Missing data problems result in the exclusion of 100 cases, leaving us with 4,258 individuals for the regression analysis.

A principal problem for the analysis of wages is that the income variable includes all income, not just labor income, which makes it difficult to isolate wage income.[7] However, the survey asks about the primary source of income used to maintain themselves, followed by the possibility of providing four additional sources of income, information which permits us to identify which workers only have labor income.[8]

For the analysis, we considered three samples of individuals. The first uses all individuals who reported working in the past week and defines their total income as their wage income, except for workers who do not report labor market earnings as a source of income, who are excluded.[9] The second includes only those workers who report that labor market earnings were their primary source of income. The third includes only those workers who report that labor market earnings were their only source of income.

All three samples suffer from potential bias. The first sample will over-estimate the wages of all workers who have other incomes and this bias is potentially related to the health status of the worker. For instance, workers with worse health status may have lower wages, leading to higher family transfers to the worker. The second sample addresses this problem (although it does not eliminate it) but reduces the working sample by approximately 9% of the observations. The third sample assures that we are measuring labor market earnings in the income variable but drops approximately 36% of the observations. Both the second and the third sample may be subject to another type of bias as these workers appear to be healthier than the sample of all workers.

Because of the obvious importance of earnings to the analysis, we carried out estimations for all three samples. We believe that the second sample is the most reasonable for our analysis. Therefore, we present the results from the second sample in the main body of text, that is from the sub-sample of workers reporting that their principal form of income was from working. These results may, nevertheless, bias the results downward. That is, given that it is a healthier sample than the sample of all workers, we may be more likely to find a lower impact of health on wages so that our results should be interpreted as conservative estimates of the true effect. Additionally, to assure that our results are not affected by the potential contamination of other income mixed in with labor income, we repeat the results based on the third sample and include these in Appendix B.

An additional problem is that the National Aging Survey reports income as a categorical variable (0, 0-500 pesos 500-1000 pesos etc.) For all workers, we use the midpoints of the income

[7] The income question is phrased as follows, "contando todas las formas de ingreso que tiene, me puede indicar por favor, en cuanto calcula sus ingresos mensuales" (including all the sources of income, how much would you calculate is your monthly income).
[8] The sources of income questions are phrased as follows. First, individuals are asked "de donde obtiene los ingresos para sostenerse economicamente" (where do you get the income to sustain yourself economically). Individuals respond from a given list including salary and earnings, pensions, family help, savings, begging, self-employment earnings and others. After giving one answer, they are asked " si tiene otra fuente de ingreso" (if they have another source of income). They may give up to 4 other sources of income from the same list. In this paper, we assume that the first source reported is the principal (most important) source, although there is no way to verify this. In the sample, 3279 elderly individuals have only one source of income, 995 have two sources, 65 have three sources and 3 have four sources of income. For the working sample, 890 have one source of income, 434 have two sources and 29 have three sources of income
[9] It is important to point out that of the 1,384 workers, 194 do notreport labor market earnings in any of the possible sources of income. although they do report other types of earnings. Some may be unpaid family workers or self-employed workers who currently have no earnings after costs. It may also be that source categories were not sufficiently detailed to capture some income sources of work (approximately 91 of the 194 include "other" as their first source of income). For the purposes of this article, the problem is how to classify these workers and whether or not to omit them from the analysis. Given the inability of knowing exactly whether these workers have labor market earnings, we decided to exclude them from the analysis.

categories to construct total earnings, which is then divided by hours worked in the previous week in order to have a measure of hourly wages.

The survey has sufficient information on health to allow for a number of different health indicators. We considered a large number of different indicators and finally settled on three categories of indicators of health in the elderly population:

a) Disabled days: The total number of disabled days in the sample is equal to the number of sick days, hospital days, and accident days during the previous 180 days. We considered excluding hospital days, given that hospital days may partly be determined by whether or not there are hospitals in the area where the individual lives and therefore would be endogenous to the health indicators. Nevertheless, there is very high correlation between the three so that we retained the definition of disabled days as the sum of the three. Given that the majority of the sample reports having no disabled days, in the empirical analysis, we use a dummy variable to represent whether disabled days were incurred or not.[10]

b) Self-reported ordinal indicators of health: There are two such measures in the survey. The first measures how your health compares to the health of other individuals your age on a scale of 1 to 5: much worse, worse, similar, better, or much better. The second, measured on a scale from 1 to 5, indicates whether you consider your health to be very bad, bad, all right, good or very good. Given the high correlation between these two variables, we only include results from the first measure. For ease of exposition in the descriptive analysis, we also used a dummy variable set equal to 1 if you considered your health to be better or much better than individuals your age and 0 otherwise. In the regression analysis, nevertheless, we retained the five distinctive categories.

c) Functional limitations: This variable ranges from 0 to 4, defined as the sum of the number of following activities which can only be performed with difficulty or cannot be performed at all: walking up stairs, walking 300 meters or more, carrying a heavy object for 100 meters, or doing light domestic tasks such as washing dishes, sweeping, cooking etc.[11] [12]

The survey also includes information on migration. Respondents are asked for how long they have lived in their present residence. Over 43% reply that they have always lived in their current residence. This variable can be used to divide the sample into "movers" and "stayers". Migration is an important variable in this analysis for at least two reasons. First, migration can be considered a type of human capital investment in and of itself. Secondly, migration may be expected to affect some of the critical variables used in the analysis. For example, the current health service supply variables would be expected to be less relevant to the population that had migrated. [13]

[10] It is important to note that most disabled days indicators in other data sets are defined over a much shorter reference period (for instance two weeks or a month).

[11] This classification was selected following the classification used in Davis et. al., 1997, which in turn was based on the Nagi disability scale. In this classification, tasks are classified in 3 groups, daily living activities, (such as getting out of bed, getting dressed etc.) 2)instrumental activities, such as managing money and 3)functional limitations, such as walking upstairs. We considered those questions asked in the survey corresponding to this third class of activities. See Strauss et al. 1993 for similar health measures used to study health in the Jamaican case.

[12] It is important to emphasize that we have defined this variable in a somewhat arbitrary way, for instance it assumes that one functional disability has the same impact on one's health and wages as another. Nevertheless, the idea here is to capture another element of measuring health in the elderly so that it will provide further impetus to refining this indicator in accordance with the medical and public health literature in the event that these simple aggregated indicators prove significant.

[13] Unfortunately, no information is available on where the elderly lived before their current residence.

In addition to the information available from the community segment of the National Aging Survey, this research uses two sources of municipality-level information. This first is the Socio-economic Indicators and Index of Margination at the Municipal level (Indicadores Socioeconómicos e índice de Marginación Municipal), generated by the National Population Council in 1993, based on results of the Population Census of 1990. This data was compiled with the purpose of developing an indicator of marginality applicable to all the municipalities in Mexico (See Consejo Nacional de Población, 1993). It includes, as proportions of the inhabitants of each municipality: the illiterate adult population, the adult population without complete primary education, those without electricity, those whose homes have earth floors, those who lack toilet and drainage facilities, those without running water, those living in overcrowded homes, individuals in *localidades* with less than 5,000 individuals, and the working population earning less than 2 minimum salaries per month. The second source of information at the municipal level is a data base jointly developed by researchers at the Colegio de Mexico, CONAPO and Johns Hopkins University based on the records of the Secretariat of Health and the Mexican Social Security Institute and includes data on doctors, clinics and hospitals of the Mexican health system at the municipal level. Both of these data sets were merged at the municipal level with the Aging Survey.[14]

VI. DESCRIPTIVE ANALYSIS OF HEALTH AND WAGES IN MEXICO

In this section, we describe the health and labor force measures used in the analysis. Table 3 shows the labor force participation rates of the elderly. The first column measures overall labor force participation, whereas the second and third columns represent sub-samples of workers. As mentioned previously, the sample of workers who report that their principal earnings are due to labor earnings will be the main sample used in the analysis. The table clearly shows the much higher labor force participation of men than women. It is interesting to note that a significant proportion of the men over 80 (more than 22%) continue to report that they are working, much higher than comparable figures in the United States and other more developed countries.

Graph 1 shows histograms of the main health variables used in the analysis by sex. The disabled days indicator shows that about two-thirds of the sample report that they have not suffered disabled days within the last 180 days. The rest of the sample is fairly uniformly spread out between 1 and 180 days (the maximum) although there is some bunching between 1 and 10 disabled days and at 180 days. The histogram suggests that it may not be appropriate to assume that disabled days is a continuous variable. In the estimations below, we will use a dummy variable indicator to measure disabled days. On the other hand, the other health variables show more well-behaved distributions. All of the health status variables show that women tend to have worse health status than men.

Table 4 shows the measures of health status by age and by sex for all elderly individuals. There are two consistent patterns to the different health indicators. First, women again uniformly display worse health status than men at all ages. Secondly, all of the health status indicators worsen as the population ages, as would be expected.

Table 5 reports the same descriptive health statistics for the sample of workers who report that their primary income is from wage earnings. Comparing the workers to the entire elderly population as a whole demonstrates that, not surprisingly, the elderly workers display better health

[14] Because of coding problems, it has proven impossible to identify all of the codes of the rural municipalities. We have identified approximately half of the rural municipalities in the Aging Survey. For the other half, an average of all of the municipalities in the sampling framework in the Aging Survey in that state was used for the community level indicators. This implies that for 685 of the 4,358 individuals, an average of several (ranging from 2 to 10) municipality characteristics were used for their community characteristics.

status than the overall elderly population. Similar to the entire elderly population, health status is generally decreasing with age for workers. (The variable measuring disabled days however is not particularly well-behaved). Health status appears to be worse among female workers than among male workers. Nevertheless, the sample size of female workers is quite small so that unfortunately, one cannot say much about the health status of the elderly female working population.

Given that one of the main contributions of this study is the evaluation of a number of different health indicators, it is of interest to know the extent to which the health status indicators are correlated among themselves and the extent to which they are correlated with the other potential human capital indicators of education and migration. Higher correlation among the health status indicators would be reassuring in the sense that the aim is to measure 'objective' health status, and would bode well that the different health indicators may give similar and consistent results.

Tables 6 and 7 reports the correlations between the different health status indicators, the other human capital variables and the log wage. In Table 6, all three health indicators are significantly correlated and have the expected signs. Education level is also very highly correlated with all four health status indicators. Perhaps surprisingly, migration does not appear to be particularly correlated with health.[15] Table 7 reports the correlations between the log wage, the health measures, education and migration for the worker sample of those whose principal source of income is wages. Only the self-reported health measures appear to be highly correlated with the wages reported. Finally, Table 8 reports the means and standard deviations of the independent variables used in the analysis.

VII. DETERMINANTS OF HEALTH OF THE ELDERLY IN MEXICO

In this section we evaluate the determinants of health, using the different health indicators described previously. Although the main purpose of these estimations is for use in the second state regressions, these estimations are interesting in their own right. They are informative as to the factors which affect the elderly health status and the extent to which these determinants differ by sex. They also shed some light on the effects of health policy variables, such as the supply of health services.

For self-reported health status and number of functional limitations, we performed ordered probit regression and ordinary least squares estimates. Ordinary least squares may not be appropriate in the case of ordinal health indicators as it assumes that the difference between ranks is identical. For example, it assumes the difference between "bad" and "very bad" is identical to the difference between "bad" and "all right". Ordered probit models are more appropriate for estimating the relationship between an ordinal (and ordered) dependent variable and other independent variables. Nevertheless, ordered probit estimation in this first stage complicates substantially our subsequent instrumental variable estimates so that ordinary least squares would be more computationally convenient.[16] For these two ordinal health indicators, we used the threshold point parameters from the ordered probit estimation to evaluate whether it was reasonable to use the linear specification based on the ranking of 1 to 5. They both appeared to be fairly linear so that for computational considerations, the 1 to 5 ranking was retained.

The main variables affecting health status included in the health status equations are age,

[15] Migration is coded as whether or not the individual has always lived in their current residence. Approximately 44.3% of the sample reported they have always lived in their current residence. Another 37% reported they have lived in their current house for ten years or more. Unfortunately there is no information on previous place of residence.

[16] The problem can be expressed in the following manner: $y^* = \beta + \varepsilon$ where y^* is unobserved and $y=0$ if $y^* <= 0$; $y=1$ if $0 < y^* < \mu_1$; $y=2$ if $\mu_1 < y^* < \mu_2$;.....; $y= J$ if $\mu_{J-1} < y^*$. The threshold parameters (μ_J) are estimated in the model (See Greene, 1997 for more details.)

education, and urban/rural residence of the individual, along with wealth measures, including whether or not the household dwelling has running water inside the house, and whether the individual reports having savings. Higher economic status is expected to have a positive impact on the health status of the elderly.

Disaggregation of the determinants of health status by migration suggests the existence of differences in the effects of variables such as education and municipality measures according to migration status. That is, for the sample of elderly, many have moved from the place where they were born and many of their human capital investments may have been affected by the conditions in which they grew up. For instance, the health characteristics of the current area of residence may be expected to have less impact on the level of health of individuals who have migrated than those who have stayed. [17] To test this, we included interactions of all variables whose impact could possibly be affected by the migration variable.

In each table, we report the joint significance tests of the identifying variables. This is an aspect critical to the next stage of analysis to demonstrate whether an instrumental variable estimates approach is justified. If the set of identifying variables is not significant, we will be unable to justify the use of instrumental variable to adjust for potential endogeneity of health.

Turning to the results, there appear to be some differences depending on which health status indicator is used, although they retain some important similarities. For the sample of men, all of the health determinant status regressions (Tables 9 to 11) show that, as expected, health status is clearly decreasing with age. Education generally has an important impact, with higher education leading to better health status. The household wealth indicators for men (whether household dwelling has running water and whether individual has savings) also show positive effects of wealth on health.

For women, the results differ substantially between health measures. It is interesting to note that while health status worsens with age according to the disabled days indicator and the functional limitations measures, it does not worsen according to the self-reported indicator. Nevertheless, for the rest of the independent variables, there are few consistent results. For the self-reported health variables, education is positively related to health status, as is living in an urban area and wealth measured by whether household has running water and whether the women has savings. Nevertheless, the regression results for the determinants of the probability of disabled days and the functional limitations indicator show few significant variables apart from age.

The total effects of migration depend both on the migration dummy as well as the interaction of migration with other community variables. In our results, the effects of migration on health vary depending on the health status model. In the case of men, only in the model of health compared to other individuals does migration have a significant (positive) effect, whereas for women, the effect of migration is only significant in the model of disabled days.[18] In the rest of the models there is no significant effect of migration on health status.

Finally, in general, the F tests of our identifying variables are significant, with the exception of the disabled days model, where the set of identifying variables is insignificant for women. Related to this, the health service indicator (hospital beds per-capita) seems to be a much more

[17] Of course, even in the case where individuals are still living where they grew up, the local conditions will have changed from when the individuals in our sample were younger. Unfortunately, we cannot say much about these changes as we have little information on development of social infrastructure in Mexico over time. There has, however, been a historical tendency for health services of IMSS to be overly concentrated in urban areas, particularly in Mexico City (Gonzalez and Parker, 1998).

[18] The total marginal impact of migration on male health in the comparative health status model is 0.091 whereas for women in the disabled days model it is 0.039. The total effects of migration on health are calculated by summing the marginal effects of migration and the other migration interaction terms, which are evaluated at the means of all the variables interacted with migration.

important and significant determinants of the level of health for men than for women. These results show up consistently in all of the health status equation. We can only speculate here as to the reasons for these differences. They may reflect differential access or usage of health services, that is, perhaps elderly men are more likely to make, or be able to make use of available services, for instance if they are more likely to have social security health insurance than women. Another possible explanation is that the quality of services offered differs between male and female patients. Nevertheless, the fact that the identifiers are significant (with the exception noted above) implies that we may cautiously proceed to the estimation of the full instrumental variable results.

VIII. INSTRUMENTAL VARIABLE ESTIMATES OF IMPACT OF HEALTH ON WAGES

In this section, we turn to the estimations of the impact of health on wages. As presented earlier, one of our main concerns is the possible endogeneity of health to wages. In this section, we compare wage estimations which consider health status to be endogenous with wage estimations in which health status is exogenous.

We also consider the possible importance of sample selection bias on our estimations. Given the low labor force participation rates of the elderly, it is reasonable to hypothesize that the sample of elderly who work is not necessarily representative of those who do not work. For instance, the elderly who work may be those who are most able to do so, and therefore the most productive ones. In such a case, the main impact of health may be to permit people to enter the labor market and find employment, rather than affect their wages directly. On the other hand, if elderly labor market participation is largely determined by economic needs (due to lack of other sources of income), one may find that the sample of elderly workers is less productive than those who do not work, if poverty is associated with low education and other factors which may reduce one's productivity.

In our case, there is an additional restriction in the Heckman selection model, which is that our sample of workers are those whose primary source of income is through labor market earnings (rather than all workers). Therefore, the selection correction is for both being in the labor force and having this earned income as the primary source of income.[19]

To test for the possible impact of sample selection bias, we estimate Heckman sample selection models (Heckman, 1979), using the number of sons and daughters still living and whether the individual is a widow. Given the custom in Mexico of family support (and the general lack of governmental welfare programs, such as unemployment insurance), we hypothesize that the number of living children would be an indicator of potential transfers to parents, and thereby negatively related to the probability of participating in the labor market. Widowhood may imply fewer dependents necessary to support with labor market income or it may have the opposite effect, implying an increased need to work given the absence of spousal economic support.

The results of the probit model of labor force participation are reported in Table 12. The table shows that older individuals are less likely to be working, as expected. The education variables show no impact on the participation of women, whereas for men, those with lower levels of education are less likely to be working than higher educated individuals. Men in rural areas are more likely to be working, whereas there is no impact of residence on female labor force

[19] The level of health would be expected to have strong positive effects on the labor supply of elderly workers (and in probit models of working where health is assumed exogenous, the effects are large and significant). Nevertheless, it is also likely to be an endogenous variable to labor supply and it is beyond the scope of this paper to estimate a model of labor supply and wages with endogenous health measures. For this reason, we do not include health as an independent variable in the probit participation equation.

participation.

Turning to the identifying variables, being a widow reduces the probability of working for men, but increases it for women. This difference may occur because being a widow for men implies fewer dependents who must be supported, whereas women, who are not traditionally the main source of family income in Mexico, must generally support themselves if they are widowed.

It is interesting to note that the number of children, both males and females, has a negative effect only on the probability of women's labor force participation whereas there is no significant effect for males. Additionally, the negative effect of male children is much higher on women's labor force participation than female children. This may be evidence that male children tend to give more monetary support to their mothers than female children. This would be consistent with the lower labor force participation rates of women than men in Mexico, where women may be less able to transfer resources to their parents since they are less likely to be working. Finally, for men, wealth, as proxied by the existence of running water, is negatively related to the probability of working so that a higher wealth level would seem to reduce the probability of working, although it is insignificant for women.

Table 13a contains the results from regressions for all three health status measures used for men treating health as exogenous and instrumented. The coefficients on health in the OLS equations are significant, with the exception of the functional limitations health status measure. Turning to the instrumental variables estimation models, the IV estimation models show that the impacts of health on wages are much larger and much more significant for all three of the health measures used here, compared with the exogenous health models. The table also reports the Hausman tests of exogeneity in health, which shows that in all cases the exogeneity of health is strongly rejected, as expected.

It is also interesting to note some evidence that the impact of education on wages is significantly reduced when IV estimations are done for disabled days and comparative health status, relative to when health is assumed to be exogenous. In both the comparative health status model and the disabled days models the effects of education on wages are reduced as much as 50% in some cases, although there is no significant change in the functional limitations regression. Overall, these results may suggest that estimations of education on wages which do not take account of health may over-estimate the returns to education.

The impacts of health on wages for elderly men implied by the estimations are quite large. The coefficient on disabled days suggests that health, as measured by whether disabled days were incurred in the previous 180 days, reduces hourly wages by 3.29 log points or 96%.[20] The functional limitations health measure indicates that having an additional functional limitation reduces salaries by 0.867 log points or 58%. Finally, while perhaps more difficult to quantify, improving one's health relative to others (for instance from similar health level to better health level) is associated with receiving a wage that is 0.998 log points higher or 172%, controlling for observable characteristics.

All of these estimated effects, particularly that of disabled days are large and should, in our opinion, be treated as upper bound estimates of the impact of health. A more conservative estimate of the impact of health can be derived from the lower bound 95% confidence interval estimates.

[20] The estimated impact of disabled days on wages is improbably large. We do not have a previous study using this indicator as a dummy variable with which to compare. Schultz and Tansel (1997) have found in Cote d'Ivoire and Ghana that one disabled day is associated with as much as a 33% and 26% reduction in hourly wages, respectively, although these magnitudes are decreasing as disabled days increase. In our sample, the average number of disabled days for workers who incur disabled days is approximately 22.

These would imply that in the case of disabled days, poor health is associated with a reduction of 40% of wages; in the case of functional limitations, a reduction of 26.9% and for the comparative health measure, good health is associated with an increase in wages of 58.2%. Clearly, even conservative estimates demonstrate large estimated effects of health on wages.

The other variables have the expected impacts. Education is positively related to the wage estimates, as is urban residence. Migration has an important significant and positive impact on wage levels both for men and women. The impact is perhaps surprisingly strong, given that many of these individuals may have migrated decades earlier. One interpretation is that the migration variable may be a proxy for greater investments in human capital over the individual's entire lifetime which are not adequately captured with age or education.[21]

Finally, the sample selection correction coefficients show ambiguous results, with generally positive significant effects in the exogenous health wage equations and generally insignificant effects in the endogenous health equations. It is important to note, however, that the sample selection coefficients for men are extremely sensitive to the inclusion and exclusion of some variables, such as that of running water, so the results on sample selection bias should be evaluated cautionsly. For the sake of completeness, the results with no sample selection correction are included in the Appendix.

By contrast, the results for women are disappointing (see table 13b). There is virtually no impact of health on women's wages. This may be due to several factors. First, we have a very small sample of female workers, as female elderly labor force participation is less than 10%. They are also a sample who has never had a large participation rate throughout their lifecycle.[22] We are hopeful that future data on thewell-being of the elderly will include larger samples so that the important topic of health, aging, and female earnings can be studied. Secondly, our identifiers of health were weaker at explaining health status for females than for males. We feel it is important to continue studying why health service indicators and overall development seem to have less impact on female elderly health than on male elderly health.

A final aspect deserving further commentis that wages do not appear to be declining by age in our sample. This could be due to biases in our income variable, for instance, if older workers are more likely to receive other transfers that are contaminating our income measures. Nevertheless, the results using only the sample of workers who have labor income as their only source also show similar relationships between age and salaries (Appendix). Additionally, we compared the analysis with trends in wages of the elderly population in the National Employment Survey of 1995 in Mexico. This data set also did not show declines in wages between the ages of 60 and 80, the age group we use in this analysis.

IX. CONCLUSIONS

This is one of the first papers to explore the relationship between health and wages in the elderly population within a developing country. There are a number of interesting results that this paper has demonstrated.

We have found that health measures have a strong negative effect on wages for male elderly workers. Although there is some variability in the results depending on the health measure used,

[21] I am grateful to T. Paul Schultz for suggesting this interpretation.
[22] For instance, the labor force participation rate in 1950 of women in Mexico was approximately 12 percent. (Gregory, 1986).

there does emerge a consistent finding of a negative strong impact of health on wages. Our point estimations demonstrate that poor health lowers the hourly earnings of elderly males by no less than 58 percent and even with more conservative 95% confidence intervals, the lowest estimated effect of poor health is 27%. These are important factors, particularly within the context of a developing country, which does not have a widespread social security system and may therefore require that many elderly individuals work, whether or not they are healthy. Health problems may also of course prevent poor people from working and contribute to high poverty rates of the elderly. Future work will more explicitly incorporate the impact of poor health on the work behavior of the elderly.

The most important econometric implication of this paper is that the impacts of health on wages increase tremendously when an instrumental variables estimation framework is used. The Hausman tests uniformly reject the hypothesis of exogeneity of health to wages for the elderly, further confirming the appropriateness of using an instrumental variable estimation approach. It is also important to mention that in two of the three health models used, the education coefficient tends to decrease in the instrumental variable specifications. This implies that when health is not controlled for, education may pick up part of the effect of health.

In terms of future work, the relationship between available health services and health status of the elderly warrants further research, as well as the overall determinants of the health status of the elderly. Mexico is currently undergoing a number of important health reforms within its health sector. Given the extent to which the elderly population in Mexico will grow in the coming decades, further research on health and the elderly is needed so that appropriate policies may be designed in order to adequately assess their health needs and dedicate sufficient resources.

It is also likely that poverty and health status of the elderly are closely linked and that these relationships come into play in labor force decisions and the level of salaries received. Mexico's social security retirement system does not yet have 100% coverage of the elderly, a pattern which, due to Mexico's large informal sector, can be expected to continue. The extent to which poverty and health are mutually reinforcing, and how they affect the labor force participation of the elderly and the level of salaries received deserves further attention.

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Error! Bookmark not defined.TABLE 1: Historical measures of health and well-being in Mexico Error! Bookmark not defined.

Indicator	1950	1960	1970	1980	1990
Infant mortality rate per 1000 registered births	96.2	74.2	68.5	38.9	23.9
Life expectancy	49.6	59.0	62.0	66.2	69.6
For men	48.1	57.6	60.0	63.2	66.4
For women	51.0	60.3	63.9	69.4	73.1
Literacy rate /1	56.8	66.5	76.3	83.0	87.6
For men	60.4	70.5	79.5	86.2	90.3
For women	53.4	62.7	73.1	79.9	85.0
Percentage of households With water			61.0	70.7	79.4
Percentage of households With sewage system			41.5	51.0	63.6
Percentage of households With electricity			58.9	74.8	87.5
Gross national product per-capita in 1980 dollars	1,408	1,547	2,180	2,096	2,708

/1: 1950 to 1970 figures, include individuals 10 years and older.
1980 to 1990 figures, include individuals 5 years and older.

SOURCES: Compendio historico de estadisticas vitales, 1893-1993, Secretaria de Salud;
La economía Mexicana en Cifras 1990, Nacional Financiera.
Estadisticas historicas 1993, I.N.E.G.I

Table 2: Cross-sectional life expectancy for Selected Years 1930-2050

	Total	
Year	Male	Female
1930	35.5	37.0
1943	41.5	43.8
1956	53.4	56.6
1995	71.3	75.9
2000	73.1	77.6
2020	78.4	82.3
2050	82.0	85.4

Source: Gomez de Leon and Parker, 1998.

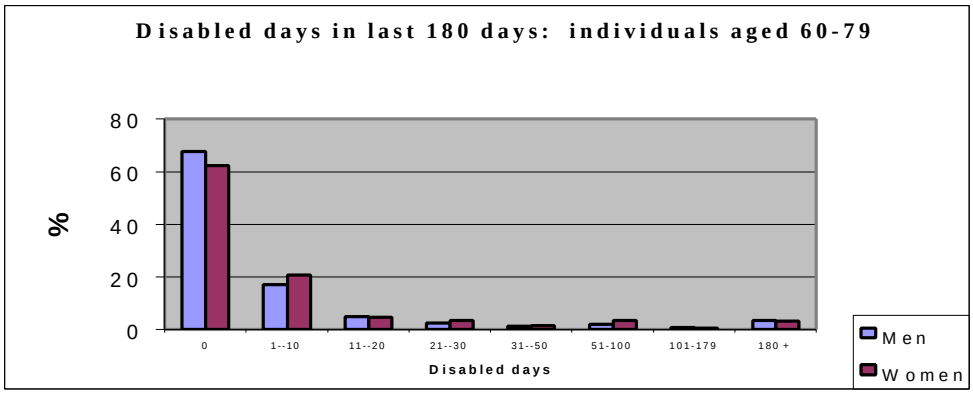
Table 3: Labor force participation of the elderly: Alternative participation measures
(%)

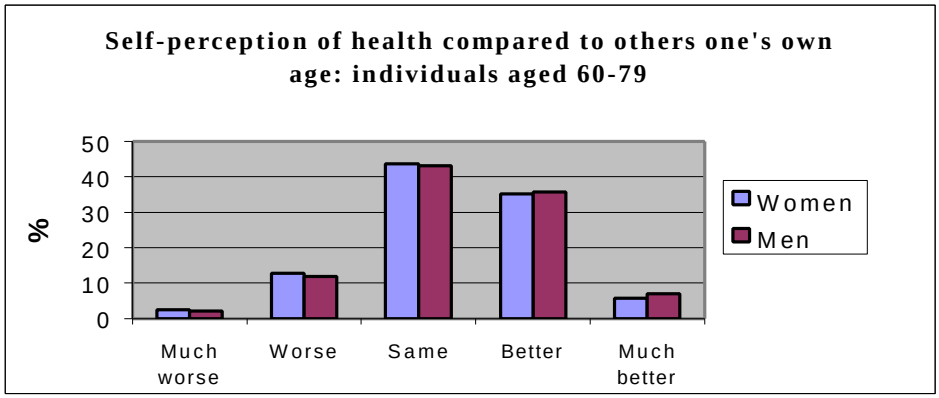
Age group	All elderly workers		Elderly workers reporting main source of income is through labor earnings*		Elderly workers whose only source of income is labor earnings	
	Male	Female	Male	Female	Male	Female
60-64	63.6	14.0	54.2	10.7	41.0	7.1
65-69	57.6	13.0	45.2	10.0	28.7	6.9
70-74	44.5	11.3	34.4	8.8	23.4	5.4
75-79	40.2	3.4	27.9	1.5	19.0	0.7
>=80	22.5	4.2	17.4	3.3	12.3	2.6
N	1,990	2,268	1,990	2,268	1,990	2,268

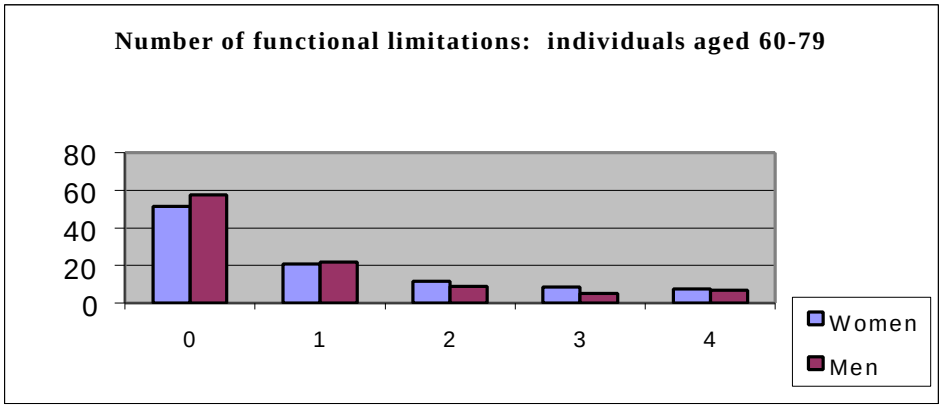
- working sample used for main estimation models

Source: National Mexican Aging Survey, 1994.

Graph1: Health status measures of the elderly in Mexico







Note: possible functional limitations are (1)walk upstairs, (2)walk 300 meters, (3)carry a heavy object, or (4)realize light domestic tasks. Functional limitation if individual reports having difficulty with or not being able to perform task.

Source: National Mexican Aging Survey, 1994

Table 4. Health status indicators of the elderly population by age and sex
Mean (Standard Deviation)

	Age group							
Health	60-64		65-69		70-74		75-79	
Indicators	Men	Women	Men	Women	Men	Women	Men	Women
With disabled days (1)	.304 (.460)	.332 (.471)	.298 (.457)	.357 (.479)	.334 (.472)	.423 (.494)	.401 (.491)	.483 (.500)
Better or much better health compared to others-own age (2)	.445 (.497)	.416 (.493)	.443 (.497)	.416 (.493)	.418 (.493)	.379 (.485)	.353 (.478)	.412 (.493)
Number of functional limitations (3)	.595 (1.01)	.726 (1.10)	.784 (1.19)	.948 (1.27)	.929 (1.24)	1.234 (1.35)	1.312 (1.46)	1.591 (1.52)
N	745	956	557	605	454	503	269	269

1. Whether disabled day incurred in last 180 days where disabled days includes sick days, days spent in hospital and days injured due to an accident.
2. Equal to 1 if respondent reported that their health was better or much better than the health of others their own age (else 0)
3. Equal to the number of functional limitations, ranges from 0 to 4: possible functional limitations are (1)walk upstairs, (2)walk 300 meters, (3)carry a heavy object, or (4)realize light domestic tasks.

Source: National Mexican Aging Survey, 1994.

Table 5. Health status indicators of working elderly individuals by age and sex
Mean (Standard deviation)

	Age group							
Health	60-64		65-69		70-74		75-79	
Indicators	Men	Women	Men	Women	Men	Women	Men	Women
With disabled days (1)	.243 (.429)	.372 (.485)	.258 (.438)	.164 (.373)	.243 (.431)	.454 (.504)	.253 (.438)	.250 (.500)
In good or very good health (2)	0.406 (0.491)	0.368 (0.484)	0.392 (0.489)	0.403 (0.494)	0.361 (0.481)	0.400 (0.495)	0.25 (0.500)	0.302 (0.462)
Number of functional limitations (3)	.330 (.638)	.435 (.767)	.416 (.793)	.250 (.627)	.602 (.917)	.674 (.892)	.773 (1.12)	- -
N	401	101	252	60	151	44	75	4

Source: National Mexican Aging Survey, author's calculations.

Note: Sample of workers who report that their main form of sustaining themselves is from work income.

1. Whether disabled day incurred in last 180 days where disabled days includes sick days, days spent in hospital and days injured due to an accident.
2. Equal to 1 if respondent reported that their health was better or much better than the health of others their own age (else 0)
3. Equal to the number of functional limitations, ranges from 0 to 4: possible functional limitations are (1)walk upstairs, (2)walk 300 meters, (3)carry a heavy object, or (4)realize light domestic tasks.

Table 6. Correlation coefficients between health and other human capital indicators

Health indicators	With disabled days	Better or much better health compared to others-own age	Number of functional limitations	Migrator	Educational level
With disabled days (1)	1.000				
Better or much better health compared to others-own age (2)	-0.253 (0.000)	1.000			
Number of functional limitations (3)	0.193 (0.000)	-0.167 (0.000)	1.000		
Migrator	0.042 (0.117)	0.013 (0.659)	-0.004 (0.887)	1.000	
Educational level	-0.0802 (0.028)	0.203 (0.000)	-0.040 (0.167)	0.020 (0.481)	1.000
N	1098	1098	1098	1098	1098

Source: National Mexican Aging Survey, 1994.
Note: Significance levels reported in parenthesis.
1. Whether disabled day incurred in last 180 days where disabled days includes sick days, days spent in hospital and days injured due to an accident.
2. Equal to 1 if respondent reported that their health was better or much better than the health of others their own age (else 0)
3. Equal to the number of functional limitations, ranges from 0 to 4: possible functional limitations are (1)walk upstairs, (2)walk 300 meters, (3)carry a heavy object, or (4)realize light domestic tasks.

Table 7. Correlation of health and human capital indicators with log wage

	Log wage	
Health and human capital indicators	Coefficient	Sign. Level
Disabled days	-0.0149	0.6106
Better or much better health compared to others own age*	0.1479	0.000
Number of functional limitations	0.0152	0.7175
Migrator*	0.1090	0.0002
Educational level	0.3638	0.000
N	1,088	

* dummy variables
Note: Sample of workers are those who report that their main form of sustaining themselves is from labor income.
Source: National Mexican Aging Survey, 1994.

Table 8. Means and standard deviations of variables used in the analysis: Elderly individuals aged 60-79

	All elderly individuals		Elderly workers*	
	Men	Women	Men	Women
Individual characteristics				
Age 60-64	.367 (.482)	.409 (.491)	.455 (.498)	.483 (.448)
Age 65-69	.275 (.446)	.259 (.438)	.284 (.451)	.289 (.454)
Age 70-74	.224 (.417)	.215 (.411)	.175 (.381)	.209 (.407)
No education	.299 (.458)	.412 (.492)	.295 (.456)	.421 (.495)
Primary education	.564 (.496)	.482 (.499)	.295 (.456)	.450 (.499)
Migrator (migrator=1)	0.549 (.497)	0.563 (.496)	0.542 (.498)	0.516 (.501)
With savings (=1)	.054 (.226)	.042 (.197)	.048 (.215)	.061 (.241)
Number of boy children living	2.84 (2.10)	2.66 (2.09)	2.76 (2.11)	1.99 (1.91)
Number of girl children living	2.76 (2.07)	2.67 (2.10)	2.67 (2.06)	2.25 (2.07)
Widow	.144 (.351)	.380 (.485)	.144 (.351)	.459 (.499)
Owns car	.122 (.328)	.037 (.189)	.164 (.371)	.071 (.287)
Log wage (1994 pesos)*			2.77 (1.01)	2.65 (1.02)
Household characteristics				
Urban-rural residence (urban=1)	0.661 (.473)	0.703 (.456)	0.629 (.483)	0.706 (.456)
Household dwelling has access to running water	.731 (.443)	.749 (.433)	.731 (.443)	.725 (.447)
Community characteristics				
% of households with dirt floor in municipality	20.9 (17.9)	19.5 (16.64)	22.4 (16.9)	19.9 (18.6)
Per-capita hospital beds in municipality	.0014 (.0011)	.0014 (.0011)	.0013 (.0014)	.0013 (.0013)
N	1990	2268	879	209

Note: Sample of workers is sample of workers with primary source of income from labor earnings
Note: Exchange rate in 1994 was approximately 3.5 pesos per dollar.
Note: Standard deviations reported in parenthesis.
Source: National Mexican Aging Survey, 1994.

Table 9. Determinants of Self-Reported Health Status: "How does your health compare with others your own age?" : Elderly individuals aged 60-79

	OLS Regression		Ordered Probit Regression	
	Men	Women	Men	Women
Constant	2.96	3.13		
	(23.4)	(22.2)		
Age 60-64 (Coef. x 100)	17.7	0.100	22.3	-0.300
	(2.95)	(0.02)	(2.89)	(-0.05)
Age 65-69 (Coef. x 10)	1.24	-0.210	1.51	-0.290
	(1.98)	(-0.34)	(1.87)	(-0.36)
Age 70-74 (Coef. x 10)	1.19	-0.960	1.53	-1.23
	(1.85)	(-1.50)	(1.85)	(-1.50)
No education	-0.197	-0.164	-0.254	-0.213
	(-2.07)	(-1.66)	(-2.06)	(-1.68)
Primary education (Coef. x 10)	-0.220	-0.110	-0.250	-0.190
	(-0.27)	(-0.12)	(-0.23)	(-0.16)
Urban-rural residence (urban=1)	0.277	0.237	0.363	0.301
	(4.02)	(3.51)	(4.08)	(3.47)
* Per-capita hospital beds	44.4	3.45	59.2	7.07
	(2.14)	(0.16)	(2.21)	(0.26)
* Dirt floor	0.100	0.048	0.100	0.058
(Coef. x 100)	(0.58)	(0.24)	(0.55)	(0.23)
With savings (=1)	0.187	0.154	0.245	0.203
	(2.29)	(1.73)	(2.25)	(1.77)
Running water in house	0.106	0.088	0.137	0.114
	(2.27)	(1.98)	(2.28)	(2.01)
Migrator (migrator=1)	0.540	0.480	0.720	0.622
	(3.47)	(2.84)	(3.58)	(2.87)
*Interaction of migration with dirt floor (Coef. x	-0.600	-0.600	-0.700	-0.800
100)	(-2.40)	(-2.52)	(-2.43)	(-2.48)
*Interaction of migration with per-capita hospital	-37.8	-45.2	-48.7	-58.3
bed	(-1.35)	(-1.55)	(-1.34)	(-1.56)
Interaction of migration with urban residence	-0.297	-0.201	-0.389	-0.253
	(-3.00)	(-2.13)	(-3.05)	(-2.09)
Interaction of migration with no education	-0.184	-0.142	-0.255	-0.197
	(-1.47)	(-1.12)	(-1.58)	(-1.21)
Interaction of migration with primary education	-0.256	-0.161	-0.348	-0.219
	(-2.25)	(-1.33)	(-2.35)	(-1.40)
Threshold1 Coeff. (Std. Err.)			-1.60 (0.17)	-1.81 (0.19)
Threshold2 Coeff. (Std. Err.)			-0.631 (0.16)	-0.857 (0.18)
Threshold3 Coeff. (Std. Err.)			0.673 (0.16)	0.442 (0.18)
Threshold4 Coeff. (Std. Err.)			2.03 (0.16)	1.81 (0.18)
Sig. test of identifying variables	F(4, 1973)= 3.28	F(4, 2251)= 3.34	chi 2 (4) = 13.83	chi 2 (4) = 12.82
Sig. test of migration and migration interaction terms	F(6,1973)=2.83	F(6,2251)=1.59	chi 2(6)=17.60	chi(2)=9.51
N, R squared	1990, 0.061	2268, 0.046	1990	2268
Model statistic	F(16,1973)=8.0	F(16,2251)=6.8	chi 2(16)=128.22	chi2(16)=107.52

* Identifying variables for health in wage equation

Note: omitted education category is more than primary schooling, omitted age category is ages 75-79

Note: For the OLS regression, t-statistics are reported in parenthesis. For the ordered probit, Z-statistics are reported in parenthesis

Source: National Mexican Aging Survey, 1994.

Table 10: Probability of incurring disabled days (in past 180 days) : Elderly individuals aged 60-79

Independent variables	Probit Regression	
	Men	Women
Age 60-64	-0.098 (-3.03)	-0.131 (-3.95)
Age 65-69	-0.089 (-2.66)	-0.114 (-3.29)
Age 70-74	-0.066 (-1.92)	-0.050 (-1.39)
No education	0.095 (1.65)	0.030 (0.52)
Primary education	0.087 (1.70)	0.004 (0.07)
Urban-rural residence (urban=1)	0.023 (0.60)	-0.084 (-2.10)
*Dirt floor	0.002 (2.22)	0.0002 (0.18)
*Per-capita hospital beds	-20.1 (-1.64)	-7.34 (-0.59)
Migrator (migrator=1)	-0.019 (-0.22)	-0.152 (-1.52)
*Interaction of migration with dirt floor (Coef.	-0.0002 (-0.15)	0.0009 (0.62)
*Interaction of migration with per-capita hospital bed	23.0 (1.42)	27.07 (1.57)
Interaction of migration with urban residence (Coef. *10)	0.090 (0.16)	0.590 (1.08)
Interaction of migration with no education	0.049 (0.66)	0.146 (1.89)
Interaction of migration with primary education	0.003 (0.05)	0.105 (1.41)
With savings (=1)	-0.169 (-3.55)	-0.003 (-0.06)
Running water in house (Coef. * 10)	0.210 (0.83)	-0.080 (-0.35)
Sig. Test of identifying variables	chi 2 (4) = 12.2	chi 2 (4) = 3.67
Sig test of migration and migration interaction terms	chi2(6)=4.83	chi2(6)=13.17
N	1990	2268
Model statistic	chi2(16)=58.92	chi2(16)=63.72

* Identifying variables for health in wage equation
Note: omitted education category is more than primary schooling, omitted age category is ages 75-79
Note: Z statistics in parentheses
Source: National Mexican Aging Survey, 1994.

Table 11: OLS and Ordered Probit of Number of Functional Limitation: Elderly individuals aged 60-79

	OLS Regression		Ordered Probit Regression	
	Men	Women	Men	Women
		C		
Constant	1.17	1.34		
	(6.61)	(6.36)		
Age 60-64	-0.733	-0.839	-0.649	-0.699
	(-8.69)	(-9.56)	(-7.87)	(-8.94)
Age 65-69	-0.516	-0.623	-0.440	-0.501
	(-5.87)	(-6.71)	(-5.17)	(-6.08)
Age 70-74	-0.394	-0.350	-0.289	-0.246
	(-4.33)	(-3.66)	(-3.33)	(-2.95)
No education	2.71	0.189	2.17	-0.304
(Coef. x 10)	(2.01)	(0.13)	(1.62)	(-0.23)
Primary education	0.910	-0.043	0.490	-0.830
(Coef. x 10)	(0.76)	(-0.31)	(0.40)	(-0.66)
Urban-rural residence	2.02	1.07	2.14	0.820
(urban=1) (Coef. x 10)	(2.08)	(1.06)	(2.23)	(0.89)
*Dirt floor	0.500	0.800	0.600	0.670
(Coef. x 100)	(2.14)	(2.89)	(2.44)	(2.54)
*Per-capita hospital beds	-48.0	-20.9	-52.8	-23.2
	(-1.65)	(-0.67)	(-1.77)	(-0.80)
Migrator (migrator=1)	0.273	-0.182	0.239	-0.212
	(1.25)	(-0.72)	(1.08)	(-1.04)
*Interaction of migration with	-0.500	-0.0001	-0.500	0.0003
dirt floor (Coef. x 100)	(-1.58)	(-0.04)	(-1.66)	(0.10)
*Interaction of migration with	-3.79	42.0	-19.5	38.7
per-capita hospital bed	(-0.09)	(0.984)	(-0.47)	(0.96)
Interaction of migration with	-23.6	-1.90	-20.6	-0.200
urban residence (Coef. x 100)	(-1.69)	(-0.14)	(-1.48)	(-0.17)
Interaction of migration with no	-0.242	0.245	-0.193	0.257
education	(-1.37)	(1.30)	(-1.09)	(1.49)
Interaction of migration with	-0.700	17.3	1.90	21.8
primary education (Coef. x 100)	(-0.05)	(0.95)	(0.12)	(1.30)
With savings (=1) (Coef. x 10)	-0.199	-0.029	-0.015	-0.015
	(-1.69)	(-0.22)	(-1.27)	(-0.13)
Running water in house (Coef.	-1.60	0.210	-1.250	0.305
x 10)	(-2.44)	(0.32)	(-1.93)	(0.51)
Threshold1 (Std. Err.)			-0.086 (0.18)	-.284 (0.19)
Threshold2 (Std. Err.)			0.567 (0.18)	0.290 (0.19)
Threshold3 (Std. Err.)			0.935 (0.18)	0.711 (0.19)
Threshold4 (Std. Err.)			1.27 (0.18)	1.17 (0.19)
Sig. Test of identifying variables	F(4, 1973)= 2.90	F(4, 2251)= 4.80	chi 2 (4) = 16.3	chi 2 (4) = 17.0
Sig test of migration and migration interaction terms	F(6,1973)=1.65	F(6,2251)=0.53	chi2(6)=9.90	chi2(6)=3.33
N, R-squared	1990, 0.0570	2268, 0.0625	1990	2268
Model statistic	F(16,1973)=7.54	F(16,2251)=9.47	chi2(16)=105.5	chil2(16)=132.8

* Identifying variables of health for wage equation

Note: omitted education category is more than primary schooling, omitted age category is ages 75-79

Note: For the OLS regression, t-statistics are reported in parenthesis. For the ordered probit, Z-statistics are reported in parenthesis

Note: Maximum number of functional limitations=4, defined as having difficulty with the following tasks 1f)walking up stairs 2) walking 300 meters or more 3)carrying a heavy object 100 meters and 4)realizing light domestic tasks

Source: National Mexican Aging Survey, 1994.

Table 12: Probit Estimations of Probability of Working: Elderly individuals aged 60-79

	Men	Women
Constant	0.023	-1.93
	(0.171)	(-7.76)
Age 60-64	0.655	1.08
	(6.83)	(5.07)
Age 65-69	0.447	1.02
	(4.51)	(4.73)
Age 70-74	0.170	0.883
	(1.65)	(4.03)
No education	-0.028	-0.054
	(-2.88)	(-0.42)
Primary education	-0.317	-0.090
	(-3.62)	(-0.73)
Urban-rural residence	-0.157	-0.027
(urban=1)	(-2.30)	(-0.30)
Migrator (migrator=1)	-0.013	-0.069
	(-0.22)	(-0.89)
*Number of male children	-0.004	-0.085
alive	(-0.269)	(-3.90)
*Number of female children	-0.016	-0.034
alive	(-1.07)	(-1.71)
*Widowed	-0.197	0.274
	(-2.33)	(3.49)
Running water in house	-1.83	-0.069
(Coeff. x 10)	(-2.73)	(-0.77)
Chi 2(12)	117.0	76.2
N	1990	2268

* Identifying variables for wage equation
Note: omitted education category is more than primary schooling; omitted age category is ages 75-79
Note: Sample of workers whose principal earnings are from labor market participation.
Note: Z statistics in parentheses
Source: National Mexican Aging Survey, 1994.

Table 13a. Selection Corrected Wage Equations with Exogenous and Instrumental Variable Estimates of Health Measures: Men aged 60-79

	Disabled days		Health compared to others		Number of functional limitations	
	Exogenous	IV estimates	Exogenous	IV estimates	Exogenous	IV estimates
Constant	1.89	2.77	1.61	-.0.611	1.89	2.96
	(3.35)	(3.15)	(2.87)	(-0.65)	(3.32)	(4.26)
Age 60-64	0.463	0.284	0.419	-0.37	0.452	-0.145
	(1.54)	(0.66)	(1.43)	(-0.11)	(1.50)	(-0.39)
Age 65-69	0.370	0.275	0.333	-0.038	0.361	-0.098
	(1.57)	(0.82)	(1.44)	(-0.14)	(1.52)	(-0.33)
Age 70-74	0.136	0.035	0.117	-0.093	0.134	-0.084
	(0.793)	(0.14)	(0.69)	(-0.45)	(0.78)	(-0.39)
No education	-0.987	-0.702	-0.945	-0.460	-0.996	-0.913
	(-6.43)	(-2.92)	(-5.60)	(-2.18)	(-6.48)	(-6.19)
Primary education	-0.818	-0.493	-0.797	-0.489	-0.828	-0.733
	(-5.13)	(-1.93)	(-5.11)	(-3.85)	(-5.20)	(-4.66)
Urban-rural residence	0.142	0.073	0.127	-0.030	0.148	0.262
	(1.21)	(0.44)	(1.11)	(-0.23)	(1.26)	(2.15)
Migrator (migrator=1)	0.154	0.301	0.152	0.188	0.147	0.132
	(1.85)	(2.26)	(1.87)	(2.30)	(1.77)	(1.63)
Disabled days	**-0.126**	**-3.29**				
	(-1.69)	**(-2.44)**				
Health compared to others-own age			**0.099**	**0.998**		
			(2.21)	**(3.21)**		
Number of functional limitations					**-0.023**	**-0.867**
					(-0.58)	**(-2.65)**
Lambda	1.31	0.998	1.23	0.353	1.32	1.44
	(2.31)	(1.21)	(2.21)	(0.54)	(2.30)	(2.60)
Hausman test of exogeneity of health		5.82 (0.0000)		3.93 (0.0001)		5.06 (0.0000)
N	879	879	879	879	879	879
Model statistic	F(9,869)=14.0	F(9,869)=14.3	F(9,869)=14.4	F(9,869)=14.0	F(9,869)=13.7	F(9,869)=13.9

Note: omitted education category is more than primary schooling; omitted age category is ages 75-79
Note: Hausman test is absolute value of t-statistic on coefficient of residual of health status measure when actual value and residuals are included in the wage equation.
Note: t statistics in parentheses
Note: Sample of workers whose principal earnings are labor market earnings.
Source: National Mexican Aging Survey, 1994.

Table 13b: Selection Corrected Wage Equations with Exogenous and Instrumental Variable Health Measures: Women aged 60-79

	Disabled days		Health compared to others		Number of functional limitations	
	Exogenous	IV estimates	Exogenous	IV estimates	Exogenous	IV estimates
Constant	3.61	3.60	3.11	2.37	3.59	3.61
	(4.10)	(4.21)	(3.40)	(1.24)	(4.11)	(4.16)
Age 60-64	-0.506	-0.553	-0.514	-0.518	-0.556	-0.498
	(-0.97)	(-1.09)	(-0.98)	(-1.03)	(-1.06)	(-0.97)
Age 65-69	-0.548	-0.532	-0.564	-0.589	-0.563	-0.541
	(-1.05)	(-1.14)	(-1.08)	(-1.15)	(-1.08)	(-1.10)
Age 70-74	-0.374	-0.436	-0.372	-0.359	-0.467	-0.355
	(-0.74)	(-0.88)	(-0.74)	(-0.74)	(-0.92)	(-0.69)
No education	-1.34	-1.36	-1.33	-1.31	-1.36	-1.34
	(-6.50)	(-5.34)	(-6.53)	(-5.77)	(-6.65)	(-5.95)
Primary education	-1.12	-1.16	-1.13	-1.13	-1.16	-1.11
	(-5.50)	(-4.00)	(-5.60)	(-4.81)	(-5.74)	(-4.64)
Urban-rural residence	0.316	0.335	0.287	0.242	0.324	0.316
	(2.20)	(2.02)	(2.00)	(1.36)	(2.27)	(2.32)
Migrator	0.263	0.234	0.286	0.325	0.237	0.267
	(1.99)	(1.25)	(2.18)	(2.04)	(1.81)	(2.00)
Disabled days	**-0.027**	**0.245**				
	(-0.20)	**(-0.23)**				
Health compared to others-own age			**0.131**	**0.326**		
			(1.83)	**(0.69)**		
Number of functional limitations					**0.141**	**-0.041**
					(1.76)	**(-0.16)**
Lambda	0.147	-0.221	0.184	0.242	0.162	0.173
	(0.45)	(-1.08)	(0.57)	(0.67)	(0.504)	(0.50)
N	209	209	209	209	209	209
Hausman test of exogeneity of health		4.51 (0.00)		4.21 (0.00)		1.71 (0.0984)
Model statistic	F(9,199)=7.22	F(9,199)=6.67	F(9,199)=7.69	F(9,199)=6.65	F(9,199)=7.65	F(9,199)=6.44

Note: Hausman test is absolute value of t-statistic on coefficient of residual of health status measure when actual value and residuals are included in the wage equation
Note: omitted education category is more than primary schooling; omitted age category is ages 75-79
Note: t statistics in parentheses
Note: Sample of workers whose principal earnings are labor market earnings.
Source: National Mexican Aging Survey, 1994.

Appendix A: Wage equations of main text samples uncorrected for sample selection

Appendix Table A.1 Wage Equations with Exogenous and Instrumental Variable Health Measures: Men aged 60-79

	Disabled days		Health compared to others		Number of functional limitations	
	Exogenous	IV estimates	Exogenous	IV estimates	Exogenous	IV estimates
Constant	3.979	3.733	3.54	-0.676	4.421	3.83
	(8.33)	(10.3)	(6.77)	(-0.66)	(7.20)	(11.8)
Age 60-64	-0.618	-0.176	-0.659	-0.206	-0.669	-0.582
	(-1.33)	(-0.82)	(-1.43)	(-1.23)	(-1.45)	(-2.61)
Age 65-69	-0.646	-0.053	-0.694	-0.169	-0667	-0.414
	(-1.38)	(-0.24)	(-1.49)	(-0.98)	(-1.42)	(-1.94)
Age 70-74	-0.492	-0.089	-0.523	-0.149	-0.569	-0.208
	(-1.04)	(-0.36)	(-1.11)	(-0.79)	(-1.20)	(-1.00)
No education	-1.35	-0.526	-1.353	-0.354	-1.368	-0.780
	(-6.55)	(-2.47)	(-6.58)	(-2.15)	(-6.64)	(-6.02)
Primary education	-1.10	-0.269	-1.11	-0.394	-1.13	-0.562
	(-5.48)	(-1.33)	(-5.58)	(-3.33)	(-5.66)	(-4.81)
Urban-rural residence	0.291	0.197	0.261	-0.021	0.304	0.378
	(2.13)	(1.41)	(1.79)	(-0.16)	(2.11)	(4.19)
Migrator	0.260	0.322	0.287	0.198	0.245	0.137
	(2.02)	(2.28)	(2.24)	(2.30)	(1.97)	(1.61)
Disabled days	**-0.039**	**-3.48**				
	(-0.286)	**(-2.37)**				
Health compared to others-own age			**0.139**	**1.11**		
			(1.91)	**(3.61)**		
Number of functional limitations					**0.102**	**-0.984**
					(1.22)	**(-2.89)**
Model statistic	F(8,870)=8.72	F(8,870)=8.54	F(8,870)=9.18	F(8,870)=8.93	F(8,870)=9.07	F(8,870)=7.86
N	879	879	879	879	879	879
Hausman test		5.60		8.79		4.89
Of exogeneity of health		(0.00)		(0.00)		(0.00)

Note: omitted education category is more than primary schooling; omitted age category is ages 75-79.
Note: Hausman test is absolute value of t-statistic on coefficient of residual of health status measure when actual value and residuals are included in the wage equation.
Note: t statistics in parentheses.
Note: Sample of workers whose principal earnings are labor market earnings.
Source: National Mexican Aging Survey, 1994.

Appendix Table A.2. Wage Equations with Exogenous and Instrumental Variable Health Measures: Women aged 60-79

	Disabled days		Health compared to others		Number of functional limitations	
	Exogenous	IV estimates	Exogenous	IV estimates	Exogenous	IV estimates
Constant	3.979 (8.33)	3.992 (8.22)	3.54 (6.77)	1.772 (0.97)	4.421 (7.20)	3.961 (9.12)
Age 60-64	-0.618 (-1.33)	-0.595 (-1.26)	-0.659 (-1.43)	-0.806 (-1.85)	-0.669 (-1.45)	-0.712 (-1.27)
Age 65-69	-0.646 (-1.38)	-0.650 (-1.44)	-0.694 (-1.49)	-.886 (-1.81)	-0667 (-1.42)	-0.697 (-1.41)
Age 70-74	-0.492 (-1.04)	-0461 (-0.92)	-0.523 (-1.11)	-0.604 (-1.41)	-0.569 (-1.20)	-0.612 (-0.94)
No education	-1.35 (-6.55)	-1.333 (-5.45)	-1.353 (-6.58)	-1.309 (-5.06)	-1.368 (-6.64)	-1.328 (-5.38)
Primary education	-1.10 (-5.48)	-1.081 (-3.88)	-1.11 (-5.58)	-1.11 (-5.07)	-1.13 (-5.66)	-1.107 (-4.90)
Urban-rural residence	0.291 (2.13)	0.283 (1.66)	0.261 (1.79)	0.124 (0.59)	0.304 (2.11)	0.319 (1.84)
Migrator	0.260 (2.02)	0.282 (1.50)	0.287 (2.24)	0.417 (2.26	0.245 (1.97)	0.233 (1.42)
Disabled days	**-0.039 (-0.286)**	**-0.200 (-0.19)**				
Health compared to others-own age			**0.139 (1.91)**	**0.712 (1.24)**		
Number of functional limitations					**0.102 (1.22)**	**0.206 (.226)**
Model statistic	F(8,200)=8.72	F(8,200)=7.68	F(8,200)=9.18	F(8,200)=6.46	F(8,200)=9.07	F(8,200)=7.86
N	209	209	209	209	209	209
Hausman test of exogeneity of health		3.34 (0.00)		5.32 (0.00)		1.53 (0.13)

Note: omitted education category is more than primary schooling; omitted age category is ages 75-79.
Note: Hausman test is absolute value of t-statistic on coefficient of residual of health status measure when actual value and residuals are included in the wage equation.
Note: t statistics in parentheses.
Note: Sample of workers whose principal earnings are labor market earnings.
Source: National Mexican Aging Survey, 1994.

Appendix B: Alternative sample results: the sample of elderly workers whose only source of income is labor income

Appendix Table B.1: Probit Estimations of Probability of Working: Elderly men aged 60-79

Independent variable	Men
Constant	-0.393 (-2.71)
Age 60-64	0.606 (5.94)
Age 65-69	0.290 (2.71)
Age 70-74	0.121 (1.09)
No education	-0.075 (-0.75)
Primary education	-0.141 (-1.56)
Urban-rural residence (urban=1)	-0.273 (-3.96)
Migrator (migrator=1) (Coeff. x 10)	0.109 (1.75)
*Number of male children alive (Coeff. x 10)	-0.032 (-2.08)
*Number of female children alive (Coeff. x 10)	-0.0034 (-0.221)
*Widowed	-0.280 (-3.04)
Running water in house	-0.131 (-1.84)
Chi 2(12)	111.6
N	1990

* Identifying variables for wage equation
Note: omitted education category is more than primary schooling; omitted age category is ages 75-79
Note: Sample of workers whose only reported earnings are from labor market participation.
Note: Z statistics in parentheses.
Source: National Mexican Aging Survey, 1994.

Appendix Table B.2: Alternative sample results: Selection corrected wage equations with Exogenous and Instrumental Variable Estimates of Health Measures: Working men aged 60-79 whose only source of income is labor income

	Disabled days		Health compared to others		Number of functional limitations	
	Exogenous	IV estimates	Exogenous	IV estimates	Exogenous	IV estimates
Constant	2.13 (3.41)	2.35 (2.54)	1.97 (3.15)	-0.035 (-0.04)	2.17 (3.45)	2.97 (3.31)
Age 60-64	0.182 (0.657)	0.200 (0.504)	0.139 (0.513)	-0.383 (-0.91)	0.159 (0.57)	-0.227 (-0.54)
Age 65-69	0.041 (0.204)	-0.030 (-0.11)	0.016 (0.078)	-0.339 (-1.14)	0.026 (0.13)	-0.270 (-0.84)
Age 70-74	-0.058 (-0.318)	-0.644 (-0.25)	-0.074 (-0.41)	-0.282 (-1.10)	-0.067 (-0.37)	-0.233 (-0.95)
No education	-0.777 (-5.70)	-0.582 (-2.51)	-0.752 (-5.55)	-0.353 (-1.72)	-0.778 (-5.74)	-0.711 (-4.67)
Primary education	-0.625 (-4.69)	-0.423 (-1.83)	-0.619 (-4.72)	-0.477 (-2.93)	-0.627 (-4.72)	-0.557 (-3.66)
Urban-rural residence (urban=1)	0.084 (0.63)	0.038 (0.19)	0.078 (0.59)	-0.016 (-0.09)	0.091 (0.68)	0.201 (1.22)
Migrator (migrator=1)	0.326 (3.42)	0.404 (2.78)	0.321 (3.42)	0.287 (2.52)	0.321 (3.38)	0.278 (2.77)
Disabled days	**-0.067** **(-0.714)**	**-2.54** **(-1.41)**				
Health compared to others-own age			**0.074** **(1.51)**	**1.04** **(3.12)**		
Number of functional limitations					**-0.025** **(-0.49)**	**-0.485** **(-1.24)**
Lambda	0.736 (1.54)	1.50 (2.60)	0.658 (1.39)	-0.303 (-0.43)	0.711 (1.48)	0.320 (0.56)
Model statistic	F(9,607)=7.89	F(9,607)=7.75	F(9,607)=7.87	F(9,607)=8.01	F(9,607)=7.86	F(9,607)=7.90
N	617	617	617	617	617	617
Hausman test of exogeneity of health		5.72 (0.00)		6.63 (0.00)		3.95 (0.00)

Note: omitted education category is more than primary schooling; omitted age category is ages 75-79
Note: Hausman test is absolute value of t-statistic on coefficient of residual of health status measure when actual value and residuals are included in the wage equation
Source: National Mexican Aging Survey, 1994.