



U.S. Department of Health and Human Services  
Assistant Secretary for Planning and Evaluation  
Office of Disability, Aging and Long-Term Care Policy



# **CHANGES IN COVERAGE IN THE INDIVIDUAL AND GROUP HEALTH INSURANCE MARKETS AND THE EFFECT OF HEALTH STATUS**

April 2008

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Bradley Herring, Ph.D.  
Johns Hopkins University, Bloomberg School of Public Health

Xue Song, Ph.D.  
Thomson Medstat

Mark Pauly, Ph.D.  
University of Pennsylvania, Wharton School

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# EXECUTIVE SUMMARY

Although the vast majority of privately-insured people in the United States obtain their coverage in the employment-based group market, about 17 million people under age 65 were insured in the individual health insurance market in 2006. About 47 million people, or 16 percent of the total United States population, were without health insurance coverage in 2006. Researchers know relatively little about how the group and individual markets actually function for those with chronic health conditions, and much of what we know is based on point-in-time analyses of insurance coverage. However, insurance coverage is actually very dynamic due to changes in employment and because eligibility for public programs typically depends on income and other criteria. This paper provides an in-depth look at the impact of health status on changes in coverage in these insurance markets using data from the Medical Expenditure Panel Survey (MEPS). We also use these data to examine the effect of health status on changes in premiums in the individual insurance market.

## Background

The effect of health status on insurance coverage is complex. People who are in poor health have greater need for insurance, but being in poor health can be a barrier in obtaining coverage. Sicker people are thought to be more likely than healthy people to seek insurance if the amount paid for coverage does not fully reflect their poor health. Expecting this adverse selection, private health insurers are thought to engage in medical underwriting to attempt to screen out some high-risk people from obtaining coverage or charge them higher premiums. For those with coverage in the individual market, provisions ensuring guaranteed renewal prohibit insurers from dropping coverage for high-risk people. However, if insurers increase the premium for all renewals at a rate higher than general medical inflation, this may make healthy people more likely to drop coverage. For those with coverage in the group market, the ability to work can be affected by health status, so some people in poor health may lose their access to group insurance.

## Data

The MEPS is an ideal data set to examine these complex relationships. It is a nationally-representative household survey conducted by the Agency for Healthcare Research and Quality since 1996 that collects information on health insurance coverage, health spending, health status, and general demographic, employment, and economic characteristics of a nationally-representative population. Monthly data on insurance coverage were collected from survey respondents for two full years, so it is possible to examine *changes* in insurance coverage, health status, and premiums paid over time. The rich data regarding chronic health conditions of the survey respondents enables us to construct detailed forecasts of medical spending. Finally, the relatively

large sample size of the MEPS (approximately 70,000 non-elderly people from 1996 to 2004) enables us to better examine certain relatively uncommon populations -- namely those with high levels of expected expense and those insured in the individual insurance market.

## Results

This paper begins by examining descriptive data for the “stability” of coverage over a two year period. We examine transitions in insurance coverage by the source of initial coverage (e.g., Medicaid, employment-based insurance, and individual insurance), employment type (e.g., “health insurance units” (HIUs) comprised of non-workers, the self-employed, small-firm wage-earners, or large-firm workers earners), and income. Overall, the individual market appears to be less stable than the group market for the population as a whole, but retention rates for coverage are actually comparable between the self-employed in the individual market and wage-earners in the group market, implying that the individual market can be a stable source of coverage for a sub-set of the population best-suited for that market. For example, 91 percent of those with employment-based insurance still have it two years later, compared to 65 percent of those with individual insurance. However, if an individually-insured person is in self-employed HIU, the figure rises to 83 percent. (About 10 percent of those insured in the individual market are in a non-employed HIU, 44 percent are in a self-employed HIU, and 46 percent are in a wage-earning HIU.) We also observe marked differences in baseline insurance status by income level. Almost 85 percent of those above 300 percent of poverty have coverage through employer plans, and only 10 percent are uninsured. However, only 44 percent of those below 300 percent of poverty are covered by employer plans, and 21 percent are covered by Medicaid or the State Children’s Health Insurance Program (SCHIP), and 31 percent are uninsured.

Second, we examine the impact of health status on both insurance coverage at a “point-in-time” and changes in coverage over time. One specification for health status uses a set of 15 chronic health conditions (e.g., diabetes), while a second specification for health status also includes prior-period self-reported health (i.e., excellent, very good, good, fair, or poor). For both specifications of health, unhealthy people appear to be significantly more likely to be covered than healthy people in the group market *relative* to the individual market. For the first specification of expected expense, we observe a positive relationship between being sick and being insured in the group market and no relationship between being sick and being insured in the individual market. For the second specification of expected expense, we observe no relationship between being sick and being insured in the group market, and a negative relationship between being sick and being insured in the individual market. The addition of self-reported health status appears to reduce the baseline level of coverage (negatively), but the relative effect of health status on group versus individual coverage is the same. When we examine changes in coverage over time, we observe that unhealthy people who are initially-uninsured are significantly more likely to obtain coverage in both the individual market and the large-group market. In addition, sicker people who are

initially-insured in the large-group market are significantly more likely to lose their coverage. We speculate that this loss in coverage is due to a loss in employment, but we do not examine this formally.

Third, we examine whether sicker people have more generous coverage (e.g., lower deductibles and copayments) by examining the fraction of total spending covered by private health insurance. Consistent with our expectations, sicker individuals tend to obtain more generous coverage than their healthy counterparts, all else equal. However, the magnitude of this effect does not appear to be large. We also find that the larger the firm one is employed with, the more generous coverage one obtains.

Finally, we investigate whether individual market premiums are higher for those in poor health. We find no evidence that being in poor health is associated with a higher premium, or that the onset of a chronic condition is associated with an increase in the premium from one year to the next. These findings suggest that guaranteed renewability is successful in providing protection against “reclassification risk” in individual insurance markets.



# 1. INTRODUCTION

Although the vast majority of privately-insured people in the United States obtain their coverage in the employment-based group market, data from the March 2007 Current Population Survey indicate that there were 17.1 million people under age 65 insured in the individual health insurance market in 2006, or about 9.5 percent of the privately-insured population. In addition, about 47 million people, or 15.8 percent of the total United States population, were without health insurance coverage in 2006. Some proposals to decrease the number of uninsured in the United States, such as those from President Bush's 2007 State of the Union and from 2008 Presidential Candidates Giuliani, Romney, and McCain, would rely on an expanded individual market. Policymakers however frequently voice concerns about the extent to which this market provides affordable coverage for those in poor health. The employment-based health insurance system generally offers pooled premiums for those with coverage, but not all people have access to group coverage and the proportion of firms offering coverage has decreased over time.

Researchers know relatively little about how the group and individual markets actually function for those with chronic health conditions. Moreover, while much of what we know is based on point-in-time analyses of insurance coverage, we know that insurance coverage is actually very dynamic due to changes in employment and changes in eligibility for public programs. Self-selection suggests that sicker people are more likely than healthy people to seek insurance if premiums are not proportional to health status. Expecting this adverse selection, insurers are thought to engage in medical underwriting to attempt to screen out some high-risk people from obtaining coverage or charge them higher premiums. For those with coverage in the individual market, provisions ensuring guaranteed renewal prohibit insurers from dropping coverage for high-risk people, while "durational rating" (i.e., increasing the premium for renewals at a rate higher than general medical inflation) may cause low-risk people to be more likely to drop coverage. For those with coverage in the group market, the ability to work is affected by health status, so some people in poor health may lose their access to group insurance.

There is limited empirical research on how people with varying health status obtain and maintain coverage in the individual and group health insurance markets. This paper provides an in-depth look at the impact of risk on changes in coverage in these insurance markets using data from the Medical Expenditure Panel Survey (MEPS). We also use this data to examine the effect of risk on changes in premiums in the individual insurance market.

## 2. METHODS

### 2.1. Data

The MEPS is a nationally-representative household survey that has been conducted by the Agency for Healthcare Research and Quality since 1996. It collects data on the cost, scope, and breadth of private health insurance held by the United States population. It also contains data on health spending, health status, and general demographic, employment, and economic characteristics of survey respondents. The MEPS data are particularly useful for the issues outlined in the above section for the following three main reasons.

The first reason is that information was collected from survey respondents for two full years, so it is possible to examine *changes* in insurance coverage, health status, and premiums paid over time. Panel data allow us to describe how individuals acquire and lose both individual and group coverage. The second reason is that a rich set of characteristics regarding chronic health conditions was collected from survey respondents. This allows us to construct an accurate assessment of each person's expected medical spending. The third reason is that it has a relatively large sample size. Because high risks are by definition rare, sample size is critical to enable sufficient statistical power to detect relationships of risk on coverage and premiums. With seven periods of MEPS data (i.e., 1996-1997, 1997-1998, 1998-1999, 1999-2000, 2001-2002, 2002-2003, and 2003-2004), we have two year's worth of information for approximately 70,000 non-elderly people without public coverage. We exclude all those with Medicare coverage in this analysis. We do, however, examine those with Medicaid and State Children's Health Insurance Program (SCHIP) coverage in some of our descriptive analyses.

We analyze whether people have private health insurance coverage, distinguishing whether that coverage is obtained in the employment-based health insurance market or the individual health insurance market. The MEPS also defines an "other group insurance" category that is neither employment-based nor "directly-purchased" individual insurance; the MEPS questionnaire lists insurance obtained through a "professional association" or through a "health insurance purchasing alliance" as examples of this "other group insurance" category. We therefore also examine this population with "other group insurance" in some of our descriptive analyses. In addition, we focus on individual insurance in more detail later in this paper by examining the premiums that insured people pay, and we focus on employment-based insurance in more detail later by examining offer and take-up rates of coverage.

In order to understand how people obtain private health insurance coverage -- especially distinguishing between individual and group coverage -- we classify all people by whether they have access to employment-based group insurance. For those that do have access to employment-based insurance, we identify whether it occurs through small or large-group insurance. Consistent with our earlier work, we define

“access” to group insurance here by whether one is simply employed rather than by whether one’s firm actually offers coverage (Pauly and Herring, 2007). The decision to actually work at a firm that either does or does not offer coverage is likely to be endogenous (i.e., determined by the demand for insurance), so the results from examining a sample of workers actually offered coverage would likely be biased. In this sense, we assume that someone working at a firm that did not offer health insurance coverage had the option of working for other firms that did offer coverage, with a commensurate reduction in wages, but chose otherwise. (We do, though, show tabulations for average offer rates and take-up rates across different samples further below.)

For single-person households, this classification of potential source of insurance by the type of employment is straightforward. For multi-person households, this classification requires that we consider the group of relatives within the household that would actually be eligible for a “family policy” from a private health insurer. As such, we use the “health insurance unit” (HIU) grouping, as defined by the MEPS, which assumes that dependent related children under age 22 can be covered by their parent’s policy. (For example, a five-person household with two working parents, two school-age children, and one grandparent would consist of two HIUs: the parents and their children as one HIU and the grandparent as the second HIU. Moreover, a three-person household with one parent, one college-age daughter, and one college graduate son would consist of two HIUs: the parent and dependent daughter as one HIU and the son as the second HIU.)

In determining the employment status of each multi-person HIU, we consider the job(s) held by parent(s) only and thus do not consider the job(s) held by any dependent children. Because we are interested in distinguishing between individual and group insurance (and between small and large-group insurance for those with employment-based coverage), we classify each HIU in the following hierarchical manner (assuming that, given a choice of multiple sources of coverage, people prefer coverage from larger groups with the associated lower administrative loading): We identify whether each HIU has either: an adult wage-earner in a firm with 100 or more workers, an adult wage-earner in a firm with 25-99 workers (but no wage-earner in a firm with 100 or more workers), an adult wage-earner in a firm with two to 24 workers (but no wage-earner in a firm with 25 or more workers), a part-time adult wage-earner (but no full-time wage-earner), a self-employed adult in a group of two or more workers (but no wage-earner), an adult who is self-employed alone, or no adult who is employed. (We emphasize again that the term “adult” here does not apply to dependents between the ages of 18 and 22; it applies to the head of household and, if applicable, his or her spouse).

We then define the different “potential” markets for insurance according to those who are likely candidates for either individual, small-group, or large-group coverage. The potential individual market consists of HIUs who do not have an employed adult or who have an adult that is self-employed alone. (About 59 percent of this sub-sample is from a self-employed HIU.) The potential small-group market consists of HIUs who have an adult wage-earner in a firm with between two and 24 employees. The large-

group market consists of HIUs who have an adult wage-earner in a firm with 25 or more employees. (In some set of results, we also distinguish between groups with between 25 and 99 employees and groups with more than 100 employees.) We consider HIUs with a part-time adult wage-earner or self-employed adult in a group of two or more workers as potentially having access to either individual or group insurance. We analyze this “mixed” sub-sample separate from the potential individual market sub-sample, so that the latter sub-sample can better focus on those who predominantly get their insurance in the individual market (and is not confounded by those who can obtain insurance in the group market).

These categories are mutually exclusive. For example, if one parent works in a small firm and another parent works in a large firm, this HIU is considered to have access to the large-group market, under the assumption (as noted above) that the lower administrative costs of the larger group insurance would be preferable. (For the example above of a three-person household with two HIUs, the parent’s employment status would determine the parent and college-age daughter’s HIU classification, while the college graduate son’s employment status would determine his HIU classification.)

## **2.2. Transitions in Insurance Coverage**

We begin by showing insurance coverage rates from one year to the next, by source of coverage, employment status, and family income level. We use coverage in January of the first year of the MEPS to assign individuals to the different sources of coverage, and then examine each person’s coverage one year later (i.e., January of year two in the survey) and two years later (i.e., December of year two). For our full sample of non-elderly people, 10.4 percent are covered by Medicaid or SCHIP, 65.9 percent are covered by employment-based insurance, 0.7 percent are covered by “other group” insurance, 3 percent are covered by individual insurance, and 19.9 percent are uninsured. We focus on the “stability” of these different sources of insurance coverage by measuring the percentage of individuals who keep the same type of coverage one and two years later.

We also focus on the interaction of income with these stability rates by splitting the sample by whether total annual family income for the year is above or below 300 percent of the federal poverty line. A limitation to these comparisons by income, however, is that while the insurance coverage data are monthly, the income data are annual. As a result, changes in income during the year may have a confounding influence on the differences between high-income and low-income families, particularly with respect to eligibility for Medicaid and SCHIP. For instance, a family with relatively low levels of income during the beginning of a year (e.g., 200 percent of poverty) may be initially covered by Medicaid/SCHIP but then obtain a relatively well-paying job with benefits during the middle of the year (e.g., 400 percent of poverty); this type of family would, as a result of the data available for annual income, be classified as a high-income family (based on their yearly average income) that was initially covered by Medicaid/SCHIP (in January of year one) and transitioned into group coverage (in

January of year two). Although these types of transitions from public to private coverage are important to examine (and thus included in our analysis), we do not show separate estimates for people with Medicaid/SCHIP coverage in January but total annual income over 300 percent of poverty.

Table 1 shows the stability rates for these different sources of coverage. The top panel shows these rates for the full sample, while the bottom two panels show these rates by income level. The overall stability is highest for employment-based insurance: 94 percent still have employment-based insurance one year later and 91 percent still have employment-based insurance two years later. The stability of Medicaid/SCHIP coverage is 82 percent for one year and 76 percent for two years. The stability of individual insurance is 78 percent for one year and 65 percent for two years. The stability of being uninsured is 70 percent for one year and 62 percent for two years. The stability of “other group” insurance is 66 percent for one year and 49 percent for two years. The same pattern is observed in the low-income sample below 300 percent of the federal poverty line. For the high-income sample, the stability is highest for employment-based insurance, followed by individual insurance, other group insurance, and no insurance.

Table 1 also shows marked differences in baseline insurance status by income level. Almost 85 percent of the high-income sample has coverage through employer plans, and only 10 percent are uninsured. However, only 44 percent of the low-income sample is covered by employer plans, and 21 percent are covered by Medicaid or SCHIP, and 31 percent are uninsured.

In addition, we look at these different stability rates by employment status (in results not shown). As expected, insurance coverage is the most stable for people with access to employment-based coverage in larger firms: 96 percent of those with access to group coverage from firms with more than 100 employees are still covered through employment-based insurance one year later and 93 percent of them are still covered two years later. For people with access to coverage from firms with between 25 and 99 employees, the one-year rates is 93 percent and the two-year rate is 88 percent, and for people with access to coverage from firms with between 2 and 24 employees, these rates are 91 percent and 85 percent.

However, for certain sub-sets of families, the stability rates of coverage from individual insurance or public insurance are higher than the overall results shown in Table 1 would suggest. The primary source of coverage for people with only a “self-employed alone” adult is individual insurance: 90 percent are still covered in the individual market one year later, and 83 percent are still covered two years later (in results not shown). For these types of families without access to group coverage or likely eligibility for public coverage, the individual market appears to provide a relatively stable source of coverage. Other types of families may view the individual market more as a temporary source of coverage. For people who are actually insured in the individual market, about 10 percent are in an HIU with no one employed, 22 percent are in an HIU with a self-employed alone worker, 22 percent are in an HIU with a self-

employed worker in a group of two or more workers, 13 percent are in an HIU with a part-time wage-earner, 16 percent are in an HIU with a wage-earner in a firm with between 2 and 24 workers, 6 percent are in an HIU with a wage-earner in a firm with between 25 and 99 workers, and 11 percent are in an HIU with a wage-earner in a firm with more than 100 workers.

Likewise, Medicaid/SCHIP is not surprisingly the most stable source of coverage for people with no employed adult in the HIU: 92 percent are still covered by Medicaid/SCHIP one year later and 89 percent are still covered two years later (in results not shown). Transitions in and out of public insurance therefore appear to be concentrated in working families with relative higher levels of income.

Whether the general magnitudes of these transitions are large or small, however, are certainly open to interpretation. For example, among those who start with employment-based insurance, 91 percent are still covered by employment-based insurance two years later while 7 percent are uninsured two years later. To some, this may seem reassuring as a very stable source of coverage. To others, especially those who are risk-averse, a seven percent chance of losing one's coverage may seem very worrisome as a non-trivial chance of losing one's coverage.

### **2.3. Transitions in Employment**

To get a sense as to how these transitions in insurance coverage may be caused by changes in employment over time, we examine transition rates in employment status from one year to the next. (As noted above, however, the employment status classifications shown in Table 1 use the jobs held at the beginning of the survey.) For each of the seven employment classifications, we show the distribution of employment types during the second year of the survey to illustrate the extent to which changes in employment can induce changes in insurance coverage. To be clear, these measures are not for *all* job changes, since a worker moving from one large firm to another large firm is not classified as a change in "employment status" per se.

Several patterns emerge in Table 2. First, people are generally more likely to retain their current employment status, the larger the group. For instance, 80 percent of people with access to coverage from firms with 2-24 workers maintained that employment status, while 93 percent of people with access to coverage from firms with 100 or more workers maintained that employment status. However, there does not seem to be a large difference in changes in employment between people in self-employed HIUs and people in full-time wage-earning insurance units. Between 76 percent and 83 percent of those classified as self-employed maintain their employment type compared to between 79 percent and 93 percent of those classified as wage-earners. Second, there are more transitions in employment status for low-income people relative to high-income people. For instance, 83 percent of high-income people with access to coverage from firms with 2-24 workers maintained that employment status, while 77 percent of low-income people with access to coverage

from firms with 2-24 workers maintained that employment status. (The one exception of this increased stability for higher-income HIUs is observed among the non-employed.)

## **2.4. Estimating Expected Expense**

The remainder of the analysis presented in this paper focuses on the effect that health status has on these changes in insurance status documented above. Our first step in this analysis is to develop a measure of the expected medical expense associated with the presence of chronic health conditions. (We then use this measure of expected expense as the key independent variable in different models for insurance and later use this measure of expected expense as the key independent variable in models examining premiums in the individual health insurance market.) The MEPS includes data for all medical expenditures. It includes data for amounts paid to providers out-of-pocket by people themselves and amounts paid to providers by private health insurers. (Our measures of individual health spending therefore do not include the premiums paid to insurers and instead represent the total amount of health care consumed.)

The MEPS includes data for the presence of the following 15 different medical conditions: skin cancer, cancer (other than skin cancer), diabetes, emphysema, high cholesterol, HIV/AIDS, hypertension, heart disease, stroke, arthritis, asthma, gall bladder disease, stomach ulcer, back problems, and mental problems. It also identifies the year in which each of these conditions was discovered. This feature is important, since it enables us to only consider pre-existing conditions (discovered prior to the survey year) which individuals and insurers would have used to forecast expected expense. (Conditions discovered during the survey year are not relevant.) We also use self-reported health status (i.e., excellent, very good, good, fair, or poor health) prior to the survey year as an additional indicator of the respondents' health condition that may affect expected expense. For individuals in the first year of the MEPS, we obtain prior-period self-reported health status from the National Health Interview Survey (NHIS). (The sample of people included in the MEPS is derived from a sub-set of the NHIS sample one year later.)

We use the standard "two part" regression framework to address the unique distribution of actual medical expenditures (i.e., a large number of "zeroes" in the data and a skewed distribution). The framework uses a probit model to first predict if there are any covered expenses, and then uses a Generalized Linear Model with Gamma distribution and log link to estimate the amount of expenses for those with positive expenses. The regression sample includes all privately-insured people (although predicted values are generated for both insured and uninsured people), and separate models for samples of children and adults are estimated.

In our subsequent empirical models to examine the effect of expected expense on insurance coverage (described in detail below), we are especially interested in examining the differential effects of expected expense related to age and gender versus

those related to health status. We are also interested in whether the self-reported health status measure has a different effect than the set of pre-existing chronic health conditions on the likelihood of being insured. Self-reported health status could measure the severity of these chronic health conditions (in a way that simple binary indicators do not capture) and could better represent the highest-risk individuals that insurers would try to deny coverage. Self-reported health status could also however tend to be unobservable to insurers and therefore be positively related to individual demand for coverage.

We therefore estimate this two-part model for three different sets of explanatory variables: The first model only includes age and gender. We use this as a “baseline” for the second model and for the third model. The second model adds the indicators of pre-existing chronic conditions to age and gender. The third model adds prior-period self-reported health status to age, gender, and the set of pre-existing chronic conditions.

Table 3 reports the estimated coefficients of all three models, for the sample of adults; Model #1 uses only age and gender, Model #2 adds pre-existing chronic health conditions, and Model #3 adds self-reported health status. (Separate results for the sample of children are not shown.) As expected, age is a significant predictor of medical expenditures, even when controlling for the presence of chronic health conditions. Compared with males who are 18-24 years old, older people are estimated to be significantly more likely to have covered expenses; and among those with positive expenses, older people appear to have higher costs than younger people. The positive impact on the level of expenses appears for every five-year age increment. In addition to age and gender, prior-period chronic conditions, as well as prior-period self-reported health status, are highly predictive of high medical expense. We use the estimated coefficients from the sample of privately-insured people to produce estimates of individual-level expense for both insured and uninsured people; the estimates of expected expense for the uninsured are “as if” they were insured (and therefore control for the higher levels of spending among the insured caused the lower net prices of medical care due to insurance).

As noted above, our empirical models for the effect of expected medical expense on insurance choice distinguish between age/gender-related expected expense and health status-related expected expense, where we have two different specifications for health status. We include two different measures of expected expense in each model for insurance, consistent with our prior work (Pauly and Herring, 1999; Herring and Pauly, 2001; Herring and Pauly, 2006b), and estimate each model for insurance twice, depending on the specification for health status. One measure in each regression for insurance is the log of expected expense using only age and gender as explanatory variables in the prediction models (from Model #1). The second measure in each regression for insurance is an index of “adjusted” condition-related expected expense, calculated as the ratio of expected expense using age, gender, and health conditions (with or without self-reported health status, as estimated in Models #2 and #3, respectively) relative to the expected expense based only on age and gender (from Model #1).



This index therefore measures the effect of health status on and coverage (and premiums), given one's age and gender; an index of 2.0, for instance, implies that the presence of a particular set of health conditions yields an expected expense twice as high than someone with the same age and gender in "average" health. Throughout the paper, we use the term "condition-related expense" to refer to this index of adjusted condition-related expected expense; one measure of condition-related expense is derived from Model #2 (relative to Model #1) and the other measure of condition-related expense is derived from Model #3 (relative to Model #1). Because the expected expense measures are considerably skewed, we use the log of the expected expense in our models for coverage (and premiums, later in the paper).

## 3. EMPIRICAL RESULTS

We first report the empirical findings on the impact of risk on having individual and group coverage in Section 3.1. We then examine the effect of risk on the generosity of individual and group coverage in Section 3.2. We then examine the effect of risk on premiums in the individual health insurance market in Section 3.3. Finally, we examine offer and take-up rates in the employment-based group market in Section 3.4.

### 3.1. Impact of Risk on Coverage

As noted above, people with varying health status could face different likelihoods of acquiring and maintaining coverage. On one hand, high-risk people have an incentive to obtain coverage and seek more generous benefits, especially if they may pay premiums that do not fully reflect their health status. On the other hand, insurers may try to avoid selling insurance to high-risk people if they are either unable to accurately forecast risk or unable to tailor premiums to risk. Since premiums are thought to vary with health status to a lesser extent in the group market relative to the individual market and since individual insurers are believed to engage in more aggressive underwriting to exclude high risks in the individual market relative to the group market, we expect that the likelihood of a high-risk person obtaining or maintaining coverage relative to a low-risk person will be greater in the group market relative to the individual market.

We examine the impact of risk on the probability of being covered at a point-in-time in Sub-Section 3.1.1, the impact of risk on the probability of changing one's initial coverage status in Sub-Section 3.1.2, and the impact of risk on the length of time before one changes his or her initial coverage status in Sub-Section 3.1.3. We also investigate whether and how a newly acquired chronic health condition changes one's insurance status in Sub-Section 3.1.4. As noted above, we focus on two different measures of condition-related expected expense. The first uses the set of 15 pre-existing chronic health conditions (as shown in Model #2 of Table 3). The second uses this set of 15 chronic health conditions plus the indicators for prior-period self-reported health status (as shown in Model #2 of Table 3).

In each of these regression models, we include control variables for employment status, age, age squared, gender, family size, marital status, income, race/ethnicity, education, region, and the year of the survey. We examine separate regression models for the employment sub-samples to determine whether the effect of risk on insurance differs by employment. We also examine separate regression models using samples of: (1) everyone from age 25-64 (i.e., our "all adults" sample); and (2) everyone from age zero to 64 (i.e., our "all non-elderly" sample). Our motivation for the latter specification is to increase our sample size, while our motivation for the former specification is to determine whether the inclusion of children had any discernable effects on our results.

Except for the impact of risk on the probability of having coverage at a point-in-time, we estimate separate models for those who are initially-insured and for those who are initially-uninsured, as of January of year one in the survey.

### **3.1.1. Probability of Being Covered**

The left-hand side of Table 4 shows the full set of results for the likelihood of being privately-insured at a point-in-time. The model shown in this table pools the individual, small-group, and large-group markets together; it examines the sample of adults only (rather than all non-elderly people); and it uses a measure of risk from the chronic health conditions excluding prior-period self-reported health status. These results illustrate that people having higher expected condition-related expense are more likely to be insured, that people in larger-sized employment groups are more likely to be insured, and that people who are female, married, in larger families, higher income, non-minorities, and better educated are more likely to be insured.

Table 5 shows the probit coefficient for the measure of expected condition-related expense from a number of separate regressions; each entry in this table represents a separate regression. For instance, the 0.05 coefficient from Table 4 is shown in the first column and first row of Table 5. The different rows show the results from sub-samples based on employment type of the HIU. The top panel of Table 5 shows the results for adults only while the bottom panel of Table 5 shows the result for the full non-elderly sample (i.e., adults and children). The first row in each panel shows the probit coefficient for the measure of risk that uses only the 15 chronic health conditions, while the second row in each panel shows the probit coefficient for the measure of risk that uses both the pre-existing chronic health conditions and prior-period self-reported health status. (Full results from the other specifications are not shown here.)

For the adult population, risk measured without self-reported health status appears to have a positive impact on being covered in the group markets, with the impact being much larger in the small-group market than in the large-group market: the coefficient is 0.13 in the small-group and 0.05 in the large-group market. The larger effect of health status on insurance coverage in the small-group market relative to the large-group might be due to workers more easily sorting among smaller firms offering and not offering coverage based on their health status than sorting among larger firms offering and not offering coverage for the following two reasons. First, workers simply have a greater number of small-firm options than large-firm options. Second, because larger firms are more likely to offer coverage, almost firms with more than 100 workers offer coverage (thus making it difficult for some workers to actually find a large-firm not offering coverage if they do not desire coverage), while there will likely be a mix of small-firms both offering and not offering coverage (thus making it easier for workers to find a firm not offering coverage if they do not desire coverage). On the other hand, condition-related expense based solely on chronic health conditions does not seem to be a significant predictor of being insured for people in the individual health insurance market (i.e., those who are members of unemployed, self-employed, or part-time wage-earning HIUs). High-risk people, all else equal, are therefore more likely to be insured

in the group market than in the individual market. There is an insignificant effect of risk on being insured in the individual market and a significantly-positive effect of risk on being insured in the group market using this measure.

The inclusion of self-reported health status in expected expenses has an overall negative impact on being insured (regardless of the source of coverage), but the pattern from above -- that high-risk people are more likely to be insured in the group market than in the individual market -- still holds. Condition-related expected expense including self-reported health status is significantly related to a reduction in the likelihood of being insured for those in the individual market (i.e., those who are in unemployed or “self-employed alone” HIUs). The likely explanation for this effect is that underwriters in the individual market primarily focus on screening out high-risk people with the most severe chronic health conditions and that self-reported health status is a good proxy for severity. Condition-related expected expense based on all conditions and self-reported health status is not significantly related to the likelihood of being insured in group markets. As with the other measure of risk that excludes self-reported health status, high-risk people, all else equal, are therefore more likely to be insured in the group market than in the individual market. But the “baseline” of coverage changes with the addition of self-reported health status: there is a significantly-negative effect of risk on coverage in the individual market and an insignificant effect of risk on coverage in the group market using this measure.

Thus, for either measure, a high-risk person appears to be relatively more likely to be insured in the group market than in the individual market, all else equal. The baseline level of coverage depends on the specification of risk (i.e., whether self-reported health status is included), but the different effect of risk in group relative to individual insurance is the same. This pattern of results is also observed among the full non-elderly population. The negative effect of adding self-reported health status on the likelihood of being insured is therefore more consistent with self-reported health status being a proxy for severity of disease (and thus related to insurer underwriting to exclude high-risk people from obtaining coverage, as suggested above) than with self-reported health status being unobservable to the health insurer (and thus related to individuals engaging in adverse selection, as suggested above).

### **3.1.2. Likelihood of Changing One’s Insurance Status**

The middle columns of Table 4 shows the full set of results for the likelihood of *changing* one’s initial insurance status one year later. (Rather than examine insurance coverage as the dependent variable here to be consistent with the results shown in Sub-Section 3.1.1, we present results for *changes* in initial source of coverage here to be consistent with the results presented in the next sub-section from so-called “hazard” models of the time until a change occurs.) The left-hand side of these middle two columns is for an initially-insured sample and the right-hand side of this middle group is for an initially-uninsured sample. The dependent variable for the former is *losing* insurance (and thus being uninsured one year later), and the dependent variable for the latter is *gaining* insurance (and thus being insured one year later). (As before, the

regression shown in this table is for the non-elderly sample, pooled across employment, and excludes self-reported health status from the measure of risk; full results from the other specifications are not shown.) In general, the demographic characteristics related to being insured at a point-in-time (as shown in the left-hand column of Table 4) are negatively related to becoming uninsured and positively related to becoming insured.

Table 6 shows the probit coefficient for the measure of condition-related expense from a number of separate regressions (analogous to Table 5 for being insured at a point-in-time); as before, each entry in this table represents a separate regression. For instance, the -0.02 coefficient for losing insurance in the middle of Table 4 is shown in the first column and first row of Table 6. As before, the different columns indicate the different employment types of the HIU (but we now drop the “either individual or group market” classification for those HIUs with either part-time wage-earners or self-employed workers in groups due to relatively low sample sizes for the insured and uninsured sub-samples). The top and bottom panels either exclude or include children, and the different rows exclude or include self-reported health status.

For the most part, risk is not a significant predictor for *changes* in insurance status. For those who are initially-insured, we do not observe a significant effect of risk on losing insurance for any of the sub-samples or risk specifications. For those who are initially-uninsured, the effect of risk (whether excluding or including self-reported health status) is significant for adults in the large-group market -- sicker people in the large-group market are significantly more likely to gain coverage than their healthy counterparts. Put differently, these results suggest that being sick has no effect on remaining insured and has a negative effect on remaining uninsured in the large-group market only.

### **3.1.3. “Hazard” of Changing One’s Insurance Status**

We also examine the effect of risk on changing one’s initial insurance status, using a more robust model that incorporates the rich monthly data available in the MEPS. Specifically, we estimate the number of months (1-24) that a person retains their initial source of coverage, by estimating a Cox proportional hazard model. One limitation, though, to this model is the “left censoring” of the MEPS data: people enter the sample in January rather than when they actually first obtain insurance. Another limitation is the “right censoring” of the MEPS data: people may actually keep their insurance after December of the second year. Someone’s coverage is considered to change when initially-insured people become uninsured or initially-uninsured people obtain insurance. A hazard ratio greater than one suggests that there is a higher hazard and thus a shorter survivor time, while a hazard ratio less than one suggests that there is a lower hazard and thus a longer survivor time. (Survivor time is the length of time one keeps their original coverage status.) The interpretation of the sign of the coefficient on risk in this model therefore has the same interpretation of the sign from the results presented above in Sub-Section 3.1.2: a positive coefficient represents a change away from one’s initial insurance status.

The right-hand side of Table 4 shows the full set of results for the likelihood of *changing* one's initial insurance status using the Cox proportional hazard model. As with the simpler probit models presented in the middle of this table, the left-hand side of this group is for an initially-insured sample and the right-hand side of this middle group is for an initially-uninsured sample. (As before, this regression is for the non-elderly sample, pooled across employment, and excludes self-reported health status from the measure of risk.) In general, the demographic characteristics related to losing insurance and gaining insurance are similar to those from the earlier models.

Table 7 shows the hazard ratio for the measure of condition-related expense from a number of separate regressions; each entry in this table represents a separate regression. For instance, the -1.16 ratio for gaining insurance in the right-hand side of Table 4 is shown in the second column and first row of Table 7. As before, the different columns indicate the different employment types of the HIU, the different panels exclude or include children, and the different rows exclude or include self-reported health status.

In general, the hazard ratios as presented in Table 7 suggest that high-risk people who are initially-uninsured are significantly more likely to obtain insurance in both the individual and large-group markets. (These results are consistent with those observed from the simple probit model for the large-group sample.) This relationship holds regardless of whether prior-period self-reported health status is included in the estimate of expected expense. For example, a one unit increase in log of pre-existing condition-related expense would raise the hazard of obtaining coverage by 18-28 percent in the individual market, and 13-22 percent in the large-group market.

Interestingly, high-risk people who are initially-insured appear to be significantly more likely than low-risk people to lose their coverage in the large-group market, when self-reported health status is included in the expected expense model. A possible explanation is that, in the large-group market, a person who gets an illness may perhaps lose their job and hence their coverage. The results presented earlier in Table 2 indicate that 2-3 percent of people in HIUs with a wage-earner at a firm with more than 25 workers in year one of the MEPS transition to either having no working member or only a part-time working member in year two of the MEPS; the transition rate for low-income units to either non-employment or part-time employment is 4-6 percent. (We do not, however, formally model job changes here to test for the actual effect of health status.) The effect of being high-risk does not have a significant effect on losing coverage in the individual market, but there is not a significant *difference* between the effects of risk on the insured hazard in the group market relative to the individual market. (The point estimate for losing insurance in the individual market sample is also positive, but the standard errors are very large.)

Overall, being high-risk significantly increases the chances of obtaining coverage for those initially-uninsured in the individual market and for those initially-uninsured in the large-group market. Additionally, being high-risk, as measured by pre-existing chronic conditions and self-reported health status, increases the chances of losing

coverage in the large-group market. Again, we find similar patterns for the adult population and the entire non-elderly population.

### **3.1.4. Impact of the Change in Risk on Coverage Status**

Finally, we examine whether the *onset* of a chronic condition causes one's insurance status to change and whether this relationship depends on the source of coverage. To address these issues, we estimate a probit model to examine whether one's initial insurance status *changes* one year later, similar to those presented in Sub-Section 3.1.2. The difference here is that instead of examining a measure of the *level* of condition-related expense at the beginning of the year, we examine measures of the *change* in risk during the year. We construct the three following measures for the change in risk: (1) whether someone developed a new chronic condition during the year; (2) whether someone developed his or her *first* chronic condition during the year; and (3) the condition-related expense that adds a fourth set of risk variables to the expected expense model: indicators for whether the 15 chronic conditions were newly discovered during the survey year.

Table 8 shows the results for the measure of risk from these models. Like Table 5, Table 6, and Table 7, the four columns show the different sources of coverage based on the employment status of the HIU, the top and bottom panels show sample excluding and including children, and the different rows within each panel show the different specifications for risk. As before, these models focus on the change in insurance status: within each column, the left-hand side shows results for whether the insured sample loses insurance, and the right-hand side shows results for whether the uninsured gains insurance.

Consider first those who begin insured. For the full sample that combines all sources of coverage, there is generally no effect of a new condition on losing coverage. For the sub-sample of those beginning with individual insurance, there is some evidence that the onset of a condition is negatively associated with a loss of coverage one year later (specifically, the onset of a new condition for adults and the onset of a first condition for all non-elderly people); that is, the onset of a new condition causes people to be more likely to maintain their insurance in the individual market, as one might expect. For the sub-samples of those beginning with either small or large-group insurance, there is no effect of a new condition on a loss of coverage.

Now consider those who begin uninsured. For the full sample that combines all sources of coverage, there is a significantly-positive effect of developing either a new condition or a first condition on obtaining individual insurance one year later. (These effects are observed for both adults only and for all non-elderly people.) This positive effect is observed for both the individual market sample and the small-group sample; the effect in the large-group sample is insignificant. These results in Table 8 for changes in risk for the uninsured are generally consistent with results in Table 6 and Table 7 for levels of risk for the uninsured, although the level of risk appears to matter

more for large-group coverage while the change in risk appears to matter more for small-group coverage.

### 3.2. Generosity of Coverage

We also examine whether high-risk people obtain different *quantities* of insurance and whether being in the individual, small, or large-group market influences this relationship. On the one hand, adverse selection would imply that high-risk people would buy higher quantities (with pooled premiums); on the other hand, insurers' pre-existing condition exclusions (i.e., the insurance policy does not cover medical expenses related to a pre-existing condition for, say, the first year of coverage) would imply lower quantities of insurance. Ideally, we would examine the actual breadth of coverage (i.e., cost-sharing, coverage of specific benefits), but information on these characteristics is not provided in the MEPS data.

We therefore examine the ratio of actual benefits received to actual total expenses instead. For this analysis, our sample includes everybody with private coverage and non-zero actual expenses. We estimate an OLS model to measure the impact of being high-risk on the ratio of benefits over total expenses. We control for the level of total expenses since most insurance plans provide an increasing amount of coverage as expenses rise through deductibles and out-of-pocket maximums; we include actual expense to the first, second, third, fourth, and fifth power. Because two people could have the same plan, but if one did not meet the deductible because of low spending, that plan would otherwise appear less generous than the other plan, controlling for the level of spending with these first through fifth-power terms is crucial. Our specification therefore essentially compares people at the same level of spending -- a low-risk person at, say, \$1,500 in total spending to a high-risk person at \$1,500 in total spending -- to see what fraction of the \$1,500 for them is an insurance benefit.

We also include binary variables for the employment classification of the HIU to test for whether there are overall differences in the generosity of coverage in the individual, small, and large-group markets. We include other demographic characteristics such as age, gender, income, and education. We examine low-income and high-income samples separately (using family income below or above 300 percent of the federal poverty line as the cutoff), and consider measures of condition-related expense that both exclude and include self-reported health status.

The results for the adult population are reported in Table 9. The left-hand column shows results for the full sample, the middle column shows results for the low-income sample, and the right-hand column shows results for the high-income sample. The top panel shows results excluding self-reported health status, and the bottom panel shows results including self-reported health status. (We show results for the adult sample only, but the estimated impact is very similar for the non-elderly population.) All else equal, high-risk people obtain more generous coverage: a one unit increase in the log of condition-related expenses based on pre-existing conditions is estimated to significantly



raise proportion of total expenses covered by the plan by six percentage points; the magnitude is 5 percent using the measure of risk that includes self-reported health status. The magnitude of the effect is the same for the low-income and high-income sub-samples.

Holding all other characteristics constant, we observe that the larger the group (as measured by the family employment variables), the more generous the coverage. This pattern of results can likely be explained by the effect of higher administrative loading on reducing the generosity of coverage. We also test models with interactions of risk and the firm size measures, but these interactions are generally insignificant, suggesting that the effect of self-selection by high risks into relatively more generous plans is no different in individual versus group insurance.

### **3.3. Individual Market Premiums**

We also examine the effect of risk on the premium paid for people in the individual market. This relationship is a very important factor that one considers when deciding whether to buy coverage in the individual market.

Our prior work has examined the effect of risk on the magnitude of the premium in the individual market (Pauly and Herring, 1999; Herring and Pauly, 2001; Herring and Pauly, 2006b). However, we are unaware of any research that has examined how premiums in the individual market *change* over time for a family with coverage. We investigate whether, despite the promises of guaranteed renewability provisions, insurers raise premiums or drop coverage for someone who becomes a higher risk? There are many anecdotes about this, but little data. We first estimate models for the effect of risk on the level of premiums at a point-in-time, consistent with our prior work. We then estimate models for the effect of risk on changes in premiums.

We estimate regression models that control for sample selection, by jointly estimating the impact of risk on the premium and the impact of risk on coverage (Heckman, 1979). For identification purpose, we use education variables in the coverage equation but not in the premium equation; that is, education is expected to affect if one is covered, but not to affect how much premium the person pays. Our sample includes all individual policyholders and potential policyholders of individual coverage in the 1996-2003 MEPS. Again, risk is measured by expected condition-related expense based on pre-existing chronic conditions with or without prior-period self-reported health status. Because premiums vary simply with the number of dependents, we control the number of people covered by the plan so that the risk variables measure variation due only to age, gender, and health status. The dependent variable is log of premium in 2003 dollars.

Our results for the premium at a point-in-time are presented in the top panel of Table 10. We do not find a significant relationship between premiums and chronic conditions, which is somewhat consistent with our previous regulation analysis using the

NHIS/CTS-HS data (Herring and Pauly 2006b). In that analysis, we found a statistically significant but economically small effect of condition-related expense on individual market premiums within unregulated states. We did not find a significant effect of condition-related expense on premiums in markets with community rating. Other studies show that even if individual insurers charge higher premiums to people with chronic health conditions, the magnitude is small (Pauly and Herring 1999, Herring and Pauly 2001, Hadley and Reschovsky 2003, Marquis and Beeuwkes-Buntin 2006). We have argued elsewhere that this finding is most likely explained by effective guaranteed renewability provisions which allow those who develop a chronic health condition to continue to the same premiums as those who remain in good health (Herring and Pauly 2006a). The less-than-proportional relationship between individual market premiums and the age/gender-related expected expense (i.e., elasticities of about 0.50) is consistent with the front loading by age necessary to price these insurance contracts with the guaranteed renewable feature.

We also examine whether the onset of a chronic condition causes an increase in the individual market premium one pays from one year to the next. For years 1996-2000, the MEPS only collected individual market premium data for the first year people were in the survey. Starting in 2001, the MEPS started collecting individual market premium data for the second year people were in the survey as well. We therefore have MEPS data for 2000-2002 linked to 2001-2003 to measure the premium in year one and year two. We estimate a regression model that controls for sample selection is used to estimate premium and coverage simultaneously, using employment variables as the exclusion variables since the original sample consists of individually-insured policyholders. That is, employment status is expected to affect coverage (employment gives people access to group coverage) but not premium.

We use four different measures to assess a change in risk in these models: (1) whether someone in the family developed a new chronic condition; (2) whether someone in the family developed his or her first chronic condition; (3) the condition-related expense for the family using the set of 15 potentially-new chronic conditions; and (4) the log of the actual insurance benefits paid during the first year. The first three measures for the change in risk for the family are analogous to the changes in risk for the person shown in the probit models for changes in coverage in Table 8.

We do not find support for the claim that the onset of a chronic health condition leads to a jump in the premium for one year to the next. The estimated impact of the onset of a new chronic condition and condition-related expenses is not statistically significant. The positive effect of higher actual benefits paid during year one is significantly related to an increase in the premium in year two, but the magnitude is quite small and could be explained by unmeasured variation in generosity of coverage. On the contrary, the onset of the first chronic condition seems to significantly reduce premium; this is inexplicable, and could be driven by insufficient control variables in the model. In all four models, higher premium in the previous year is a significant predictor of higher premium in the next year, as expected.

As noted above, the presence of effective guaranteed renewal provisions in individual insurance would imply that we should not observe an effect of the onset of a chronic health condition on an increase in the premium. Guaranteed renewable insurance stipulates that those within the same initial class of coverage can renew their policies as “class average” rates. While our results are consistent with this hypothesis, we cannot rule out the possibility that our lack of a finding is caused by a lack of statistical power rather than a true underlying lack of a relationship.

### **3.4. Employment-Based Offer and Take-Up Rates**

Finally, we examined descriptive data for the proportion of families offered employment-based coverage and the proportion of families taking up offered coverage. We produce these offer and take-up rates across all people in the MEPS, but also produce different estimates across people in wage-earning HIUs by the size of the firm and between high-income and low-income people. We also produce the offer and take-up rates for a sample excluding those covered by Medicaid or SCHIP and the offer rates for the sample of uninsured.

These results are shown in Table 11. Across all people, 75 percent are part of a HIU that is offered employment-based coverage, and of those, 91 percent take-up coverage. There is a large difference by income. Offer rates are 90 percent for high-income people compared to 57 percent for low-income people, and take-up rates are 95 percent for high-income people compared to 83 percent for low-income people. The offer rates and take-up rates are higher when limited the low-income sample to those not enrolled in Medicaid/SCHIP (i.e., the offer rate is 66 percent and the take-up rate is 83 percent), but they are still considerably lower than those for the high-income sample.

As expected, the offer rates and the take-up rates are higher for people with access to coverage from relatively larger firms. For instance, the offer rate people not enrolled in Medicaid/SCHIP is 64 percent for people with someone in the HIU working at a firm with 2-24 workers, 83 percent for those 25-99 workers, and 94 percent for those with more than 100 workers.

The data also indicate that a sizeable number of the uninsured have access to employment-based insurance. Across the full sample of uninsured, 32 percent have a member of the HIU that is offered group coverage; the offer rate is 43 percent for high-income people and 28 percent for low-income people. Moreover, 59 percent of the uninsured with a member of the HIU working in firms with more than 100 workers are offered coverage compared to 26 percent of the uninsured with a member of the HIU working in firms with 2-24 workers.

## 4. CONCLUSION AND DISCUSSION

We believe that our study contributes to the literature on health insurance coverage in at least four ways. First, we look at the stability of coverage in two years by the source of coverage, employment type, and income. While our results indicate that the individual market is less stable than the group market, retention rates appear relatively high for those best-suited for the individual market, namely the self-employed.

Second, we examine the impact of risk on both “point-in-time” coverage and changes in coverage. High-risk people appear to be significantly more likely to be covered than healthy people in the group market relative to the individual market. High-risk people who are initially-uninsured seem to be significantly more likely to obtain coverage in both the individual market and the large-group market, and high-risk people who are initially-insured in the large-group market seem to be significantly more likely to lose their coverage, perhaps due to a loss in employment but we cannot know for sure.

Third, we examine whether high-risk people have more generous coverage (e.g., lower deductibles and copayments). Consistent with our expectations, high-risk individuals tend to obtain more generous coverage than their healthy counterparts, all else equal. We also find that the larger the firm one is employed with, the more generous coverage one obtains.

Finally, we investigate whether individual market premium are higher for those in poor health. We find no evidence that being high-risk is associated with a higher premium or the onset of a chronic condition is associated with an increase in the premium from one year to the next. These findings suggest that guaranteed renewability is successful in providing protection against “reclassification risk” in individual insurance markets but relatively low sample size prohibits us from making a conclusive inference.

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TABLE 1: Transitions in Insurance Coverage One Year and Two Years Later, by Source of Coverage and Income										
Subsequent Coverage:	Initial Coverage:									
	Medicaid and SCHIP		Employer Insurance		Other Group Insurance		Individual Insurance		Uninsured	
	One Year	Two Years	One Year	Two Years	One Year	Two Years	One Year	Two Years	One Year	Two Years
<b>Full Sample:</b>	N=14,021 (10.4%)		N=50,993 (65.9%)		N=511 (0.7%)		N=2,195 (3.1%)		N=20,949 (19.9%)	
Medicaid and SCHIP	<b>82%</b>	<b>76%</b>	1%	1%	2%	2%	1%	2%	9%	11%
Employer insurance	5%	9%	<b>94%</b>	<b>91%</b>	18%	29%	14%	22%	19%	25%
Other group insurance	0%	0%	0%	0%	<b>66%</b>	<b>49%</b>	1%	1%	1%	1%
Individual insurance	0%	0%	0%	1%	2%	5%	<b>78%</b>	<b>65%</b>	2%	2%
Uninsured	13%	15%	5%	7%	12%	15%	6%	10%	<b>70%</b>	<b>62%</b>
<b>High-Income (Above 300% FPL):</b>	N=617 (1.2%)		N=32,268 (84.5%)		N=252 (0.7%)		N=1,262 (3.3%)		N=4,242 (10.1%)	
Medicaid and SCHIP	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Employer insurance	11%	16%	<b>96%</b>	<b>94%</b>	21%	32%	15%	24%	29%	34%
Other group insurance	0%	0%	0%	0%	<b>72%</b>	<b>54%</b>	1%	2%	1%	1%
Individual insurance	1%	1%	0%	1%	3%	7%	<b>79%</b>	<b>65%</b>	2%	3%
Uninsured	14%	19%	3%	5%	5%	6%	4%	9%	<b>65%</b>	<b>58%</b>
<b>Low-Income (Below 300% FPL):</b>	N=13,404 (21.2%)		N=18,725 (44.2%)		N=259 (7.0%)		N=933 (2.6%)		N=16,707 (31.4%)	
Medicaid and SCHIP	<b>83%</b>	<b>77%</b>	2%	3%	3%	3%	3%	3%	11%	13%
Employer insurance	5%	8%	<b>89%</b>	<b>84%</b>	14%	25%	11%	17%	15%	21%
Other group insurance	0%	0%	0%	0%	<b>60%</b>	<b>43%</b>	1%	1%	1%	0%
Individual insurance	0%	0%	0%	1%	2%	3%	<b>77%</b>	<b>66%</b>	1%	1%
Uninsured	12%	15%	9%	12%	21%	26%	9%	12%	<b>72%</b>	<b>64%</b>

<b>TABLE 2: Transitions in Employment Status One Year Later, by Income</b>							
	<b>No One is Employed</b>	<b>An Adult is Self-Employed Alone</b>	<b>An Adult is Self-Employed in a Group</b>	<b>An Adult is a Part-Time Wage-Earner</b>	<b>An Adult is in a Firm with 2-24 Workers</b>	<b>An Adult is in a Firm with 25-99 Workers</b>	<b>An Adult is in a Firm with 100 or more Workers</b>
<b>Full Sample:</b>	<i>N=6,121</i>	<i>N=1,312</i>	<i>N=2,747</i>	<i>N=4,152</i>	<i>N=11,741</i>	<i>N=9,826</i>	<i>N=29,561</i>
No one is employed	<b>75%</b>	4%	2%	8%	3%	2%	1%
An adult is self-employed alone	1%	<b>76%</b>	0%	2%	1%	0%	0%
An adult is self-employed in a group	1%	2%	<b>83%</b>	3%	1%	1%	0%
An adult is a part-time wage-earner	6%	5%	5%	<b>69%</b>	2%	1%	1%
An adult is in a firm with 2-24 workers	6%	5%	5%	6%	<b>80%</b>	6%	2%
An adult is in a firm with 25-99 workers	4%	2%	2%	4%	5%	<b>79%</b>	2%
An adult is in a firm with 100 or more workers	7%	5%	4%	8%	7%	10%	<b>93%</b>
<b>High-Income (Above 300% FPL):</b>	<i>N=316</i>	<i>N=520</i>	<i>N=1,391</i>	<i>N=1,113</i>	<i>N=3,324</i>	<i>N=3,665</i>	<i>N=16,003</i>
No one is employed	<b>67%</b>	2%	1%	3%	2%	1%	1%
An adult is self-employed alone	2%	<b>78%</b>	0%	2%	0%	0%	0%
An adult is self-employed in a group	0%	1%	<b>86%</b>	4%	1%	1%	0%
An adult is a part-time wage-earner	4%	6%	4%	<b>75%</b>	2%	1%	1%
An adult is in a firm with 2-24 workers	10%	5%	4%	5%	<b>83%</b>	4%	1%
An adult is in a firm with 25-99 workers	5%	1%	1%	4%	5%	<b>84%</b>	2%
An adult is in a firm with 100 or more workers	12%	6%	4%	7%	7%	9%	<b>95%</b>
<b>Low-Income (Below 300% FPL):</b>	<i>N=5,805</i>	<i>N=792</i>	<i>N=1,356</i>	<i>N=3,039</i>	<i>N=8,417</i>	<i>N=6,161</i>	<i>N=13,446</i>
No one is employed	<b>76%</b>	6%	3%	11%	5%	4%	3%
An adult is self-employed alone	1%	<b>73%</b>	0%	2%	1%	0%	0%
An adult is self-employed in a group	1%	2%	<b>78%</b>	2%	1%	0%	0%
An adult is a part-time wage-earner	6%	5%	5%	<b>65%</b>	3%	2%	1%
An adult is in a firm with 2-24 workers	5%	4%	6%	7%	<b>77%</b>	7%	3%
An adult is in a firm with 25-99 workers	4%	2%	3%	5%	6%	<b>75%</b>	3%
An adult is in a firm with 100 or more workers	7%	7%	4%	8%	8%	11%	<b>89%</b>

**TABLE 3: Models for Expected Medical Expense**

	Mean Value	Model 1: Age and Gender		Model 2: Age and Gender with Pre-existing Chronic Conditions		Model 3: Age and Gender with Pre-existing Chronic Conditions and Self-Reported Health	
		Probit Coefficient	GMM Coefficient	Probit Coefficient	GMM Coefficient	Probit Coefficient	GMM Coefficient
Intercept		0.18**	7.23**	0.11**	7.12**	0.09**	6.99**
<b>Age and Gender Indicators</b>							
Male 18-24	0.05	n/a	n/a	n/a	n/a	n/a	n/a
Male 25-29	0.05	0.05	-0.06	0.04	-0.04	0.05	-0.03
Male 30-34	0.06	0.06**	0.14**	0.15**	0.10*	0.14**	0.10*
Male 35-39	0.07	0.07**	0.29**	0.15**	0.24**	0.14**	0.16**
Male 40-44	0.07	0.07**	0.49**	0.21**	0.35**	0.19**	0.33**
Male 45-49	0.06	0.06**	0.77**	0.33**	0.52**	0.32**	0.48**
Male 50-54	0.06	0.06**	0.96**	0.42**	0.65**	0.40**	0.61**
Male 55-59	0.04	0.04**	1.37**	0.49**	0.97**	0.49**	0.93**
Male 60-64	0.03	0.03**	1.47**	0.61**	1.04**	0.60**	1.02**
Female 18-24	0.05	0.05**	0.38**	0.66**	0.41**	0.65**	0.42**
Female 25-29	0.05	0.05**	0.67**	0.88**	0.66**	0.88**	0.67**
Female 30-34	0.06	0.06**	0.72**	0.87**	0.71**	0.86**	0.70**
Female 35-39	0.07	0.07**	0.82**	0.79**	0.72**	0.78**	0.70**
Female 40-44	0.07	0.07**	0.77**	0.80**	0.61**	0.78**	0.58**
Female 45-49	0.07	0.07**	0.84**	0.87**	0.63**	0.86**	0.60**
Female 50-54	0.06	0.06**	1.06**	0.94**	0.77**	0.94**	0.73**
Female 55-59	0.04	0.04**	1.23**	0.97**	0.84**	0.95**	0.79**
Female 60-64	0.03	0.03**	1.41**	0.99**	1.03**	0.97**	0.95**
<b>Chronic Condition Indicators</b>							
Skin cancer	0.01	n/a	n/a	1.01**	0.22**	0.98**	0.25**
Cancer	0.01	n/a	n/a	1.03**	1.46**	0.95**	1.36**
Diabetes	0.03	n/a	n/a	1.05**	0.56**	1.01**	0.40**
Emphysema	0.00	n/a	n/a	0.42*	0.62**	0.33*	0.31**
High Cholesterol	0.04	n/a	n/a	1.07**	0.18**	1.04**	0.19**
HIV/AIDS	0.00	n/a	n/a	1.05*	1.70**	0.91*	1.65**
Hypertension	0.09	n/a	n/a	1.19**	0.29**	1.18**	0.22**
Heart Disease	0.01	n/a	n/a	1.10**	0.84**	0.98**	0.70**
Stroke	0.00	n/a	n/a	0.55*	0.71**	0.48	0.63**
Arthritis	0.01	n/a	n/a	0.91**	0.71**	0.85**	0.55**
Asthma	0.03	n/a	n/a	0.82**	0.36**	0.81**	0.30**
Gall Bladder Disease	0.00	n/a	n/a	0.38*	0.78**	0.33*	0.76**
Stomach Ulcer	0.00	n/a	n/a	0.61**	0.52**	0.58**	0.47**
Back Problem	0.07	n/a	n/a	0.51**	0.33**	0.48**	0.28**
Mental Health	0.07	n/a	n/a	0.80**	0.55**	0.77**	0.47**
<b>Prior-Period Health Status</b>							
Excellent	0.35	n/a	n/a	n/a	n/a	n/a	n/a
Very Good	0.21	n/a	n/a	n/a	n/a	0.09**	0.13**
Good	0.05	n/a	n/a	n/a	n/a	0.05**	0.32**
Fair	0.01	n/a	n/a	n/a	n/a	0.15**	0.58**
Poor	0.05	n/a	n/a	n/a	n/a	0.41**	1.16**

**SIGNIFICANCE:** \*\* estimated coefficient is significant at the 1% level, \* estimated coefficient is significant at the 5% level.



<b>TABLE 4: Full Sample Results for the Effect of Risk on Coverage: Adults Only</b>					
	<b>Probit Model for Having Coverage</b>	<b>Probit Model for Changing One's Initial Insurance Status</b>		<b>Hazard Model for Changing One's Initial Insurance Status</b>	
	<b>Full Sample</b>	<b>Initially-Insured</b>	<b>Initially-Uninsured</b>	<b>Initially-Insured</b>	<b>Initially-Uninsured</b>
Log (condition-related expense based on pre-existing chronic condition)	0.05*	-0.02	0.03	1.01	1.16**
Log (expected individual expense for age and gender)	0.01	-0.04	0.00	0.98	1.03
An adult is self-employed alone	0.06	0.61**	- 0.28**	1.69**	0.59**
An adult is self-employed in a group	0.35**	0.25	- 0.22*	1.27	0.65**
An adult is a part-time wage-earner	0.42**	0.34*	0.08	1.36	1.01
An adult is in a firm with 2-24 workers	0.85**	0.22	0.12	1.10	0.98
An adult is in a firm with 25-99 workers	1.21**	0.08	0.47**	0.91	1.51**
An adult is in a firm with 100 or more workers	1.56**	- 0.15	0.68**	0.54**	1.84**
Age	0.04**	-0.04**	0.00	0.89**	0.92**
Age squared	-0.00**	0.00*	0.00	1.00**	1.00**
Female	0.11**	- 0.04	0.07	0.97	1.15*
Number of people in the family unit	0.07**	-0.06**	0.01	0.89**	1.02
Married	0.14**	-0.01	0.08	1.00	1.09
Log of percent of poverty line	0.39**	-0.28**	0.23**	0.72**	1.17**
<b>Race (reference group: White)</b>					
African American	-0.26**	0.18**	- 0.05	1.19**	0.95
Asian	-0.22**	0.17*	- 0.02	1.21*	0.99
Hispanic	-0.48**	0.15**	- 0.32**	1.09	0.57**
<b>Education (reference group: less than high school)</b>					
High school graduate	0.43**	- 0.18**	0.27**	0.74**	1.29**
Some college	0.60**	-0.25**	0.42**	0.70**	1.66**
College graduate	0.76**	-0.29**	0.49**	0.65**	1.78**
Some graduate degree	0.86**	-0.47**	0.55**	0.63**	2.10**
N	85,708	31,849	10,400	31,785	10,211
<b>SIGNIFICANCE:</b> ** estimated coefficient is significant at the 1% level, * estimated coefficient is significant at the 5% level.					

<b>TABLE 5: Estimated Coefficients of Risk on Having Coverage: Probit Models</b>					
	<b>Full Sample</b>	<b>Individual Market</b>	<b>Either Individual or Group Market</b>	<b>Small-Group Market</b>	<b>Large-Group Market</b>
<b>Adults only:</b>					
Log (condition-related expense based on pre-existing chronic conditions)	0.05*	-0.04	0.01	0.13**	0.05*
Log (condition-related expense based on pre-existing chronic conditions and prior-period self-reported health)	-0.03	-0.15**	-0.10	0.02	-0.01
<b>Non-elderly:</b>					
Log (condition-related expense based on pre-existing chronic conditions)	0.04*	-0.01	0.03	0.12**	0.04
Log (condition-related expense based on pre-existing chronic conditions and prior-period, self-reported health)	-0.05*	-0.16**	-0.07	0.01	-0.02
<b>SIGNIFICANCE:</b> ** estimated coefficient is significant at the 1% level, * estimated coefficient is significant at the 5% level.					

<b>TABLE 6: Estimated Coefficient of Risk on Changing One's Initial Insurance Status: Probit Models</b>								
	<b>Full Sample</b>		<b>Individual Market</b>		<b>Small-Group Market</b>		<b>Large-Group Market</b>	
	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>
<b>Adults only:</b>								
Log (condition-related expense, based on pre-existing chronic conditions)	-0.02	0.03	0.11	-0.05	-0.03	-0.06	-0.03	0.14*
Log (condition-related expense, based on pre-existing chronic conditions and prior-period self-reported health)	0.00	-0.02	0.18	-0.13	-0.01	-0.13	-0.03	0.15*
<b>All non-elderly:</b>								
Log (condition-related expense, based on pre-existing chronic conditions)	-0.00	0.03	0.09	0.01	-0.04	-0.09	-0.01	0.10
Log (condition-related expense, based on pre-existing chronic conditions and prior-period self-reported health)	0.01	-0.04	0.18	-0.11	0.00	-0.19*	-0.02	0.10
<b>SIGNIFICANCE:</b> ** estimated coefficient is significant at the 1% level, * estimated coefficient is significant at the 5% level.								

<b>TABLE 7: Estimated Hazard Ratio of Risk on Changing One's Initial Insurance Status: Cox Proportional Hazard Models</b>								
	<b>Full Sample</b>		<b>Individual Market</b>		<b>Small-Group Market</b>		<b>Large-Group Market</b>	
	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>
<b>Adults only:</b>								
Log (condition-related expense, based on pre-existing chronic conditions)	1.01	1.16**	1.37	1.23**	0.87	1.13	1.04	1.19*
Log (condition-related expense, based on pre-existing chronic conditions and prior-period self-reported health)	1.06	1.12**	1.21	1.18*	0.97	1.06	1.10*	1.22**
<b>All non-elderly:</b>								
Log (condition-related expense, based on pre-existing chronic conditions)	1.04	1.16**	1.36	1.28**	0.89	1.07	1.09	1.15*
Log (condition-related expense, based on pre-existing chronic conditions and prior-period self-reported health)	1.06	1.08*	1.23	1.18*	0.98	1.02	1.09*	1.13*
<b>SIGNIFICANCE:</b> ** estimated coefficient is significant at the 1% level, * estimated coefficient is significant at the 5% level.								

<b>TABLE 8: Estimated Coefficient of New Risk on Changing One's Initial Insurance Status: Probit Models</b>								
	<b>Full Sample</b>		<b>Individual Market</b>		<b>Small-Group Market</b>		<b>Large-Group Market</b>	
	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>	<b>Initially Insured</b>	<b>Initially Uninsured</b>
<b>Adults only:</b>								
Onset of a new condition	0.02	0.16*	-0.06**	0.32	-0.07	0.24	0.03	0.06
Onset of a first condition	0.07	0.19*	-0.69	0.53*	-0.12	0.26	0.10	0.09
Log (condition-related expense, using all risk variables)	0.03	-0.02	0.01	-0.04	-0.01	-0.05	0.03	-0.01
<b>All non-elderly:</b>								
Onset of a new condition	-0.00	0.19*	-0.52	0.37*	-0.12	0.34*	0.10	0.07
Onset of a first condition	0.03	0.20*	-0.70*	0.57*	-0.17	0.35*	0.05	0.07
Log (condition-related expense, using all risk variables)	0.05*	0.00	0.03	0.00	-0.02	0.04	0.04	-0.02
<b>SIGNIFICANCE:</b> ** estimated coefficient is significant at the 1% level, * estimated coefficient is significant at the 5% level.								

<b>TABLE 9: Estimated Coefficients of Risk and Employment Type on Generosity of Coverage for Adults Only: OLS</b>			
<b>Dependent Variable: Actual Benefits Over Actual Expenses</b>	<b>Full Sample</b>	<b>Low-Income</b>	<b>High-Income</b>
<b>Model #1:</b>			
Log (condition-related expense, based on pre-existing chronic conditions)	0.06**	0.06**	0.06**
Log (expected individual expense for age and gender)	0.09**	0.06**	0.09**
No one is employed	n/a	n/a	n/a
An adult is self-employed alone	-0.03	0.01	-0.01
An adult is self-employed in a group	0.01	0.01	0.05
An adult is a part-time wage-earner	0.06**	0.07**	0.08**
An adult is in a firm with 2-24 workers	0.09**	0.09**	0.13**
An adult is in a firm with 25-99 workers	0.11**	0.10**	0.15**
An adult is in a firm with 100 or more workers	0.15**	0.13**	0.19**
<b>Model #2:</b>			
Log (condition-related expense, based on pre-existing chronic conditions and prior-period self-reported health)	0.05**	0.05**	0.05**
Log (expected individual expense for age and gender)	0.08**	0.06**	0.09**
No one is employed	n/a	n/a	n/a
An adult is self-employed alone	-0.03	0.02	-0.01
An adult is self-employed in a group	0.01	0.02	0.05
An adult is a part-time wage-earner	0.06**	0.08**	0.08**
An adult is in a firm with 2-24 workers	0.09**	0.10**	0.13**
An adult is in a firm with 25-99 workers	0.11**	0.10**	0.15**
An adult is in a firm with 100 or more workers	0.15**	0.14**	0.19**
<b>SIGNIFICANCE:</b> ** estimated coefficient is significant at the 1% level, * estimated coefficient is significant at the 5% level.			

<b>TABLE 10: Estimated Coefficients of Expected Expense on Premiums: Two-Part Heckman Models</b>			
<b>Dependent variable: log (real premium):</b>	<b>Full Sample</b>	<b>Low-Income</b>	<b>High-Income</b>
<b>Model #1:</b>			
Log (condition-related expense, based on pre-existing chronic conditions)	-0.01	-0.04	0.01
Log (expected beneficiary expenses, based on age and gender)	0.52**	0.46**	0.56**
<b>Model #2:</b>			
Log (condition-related expense, based on conditions and prior self-reported health status)	0.04	0.07	0.02
Log (expected beneficiary expenses, based on age and gender)	0.54**	0.49**	0.58**
<b>Dependent variables: log (next year premium), as a function of last year's premium:</b>			
<b>Model #1</b>			
Onset of a new chronic condition	-0.08		
<b>Model #2</b>			
Onset of a first chronic condition	-0.36**		
<b>Model #3</b>			
Log (condition-related expense, all risk variables)	-0.06		
<b>Model #4</b>			
Log (actual benefit paid)	0.02*		
<b>SIGNIFICANCE:</b> ** estimated coefficient is significant at the 1% level, * estimated coefficient is significant at the 5% level.			

<b>TABLE 11: Offer and Take-Up Rates of Employment-Based Coverage, by Employment Status and Income</b>						
	<b>Full Sample</b>		<b>Non-Medicaid</b>		<b>Uninsured</b>	
	<b>Offer Rate</b>	<b>Take-Up Rate</b>	<b>Offer Rate</b>	<b>Take-Up Rate</b>	<b>Offer Rate</b>	<b>Take-Up Rate</b>
<b>Full Sample:</b>						
All families	75%	91%	81%	91%	32%	0%
An adult is in a firm with 2-24 workers	60%	82%	64%	82%	26%	0%
An adult is in a firm with 25-99 workers	79%	85%	83%	85%	46%	0%
An adult is in a firm with 100 or more workers	92%	92%	94%	92%	59%	0%
<b>High-Income (Above 300% FPL):</b>						
All families	90%	95%	90%	95%	43%	0%
An adult is in a firm with 2-24 workers	79%	89%	79%	89%	34%	0%
An adult is in a firm with 25-99 workers	92%	91%	92%	91%	56%	0%
An adult is in a firm with 100 or more workers	97%	95%	97%	95%	69%	0%
<b>Low-Income (Below 300% FPL):</b>						
All families	57%	83%	66%	83%	28%	0%
An adult is in a firm with 2-24 workers	47%	74%	53%	74%	23%	0%
An adult is in a firm with 25-99 workers	67%	74%	73%	74%	43%	0%
An adult is in a firm with 100 or more workers	83%	85%	4% <sup>a</sup>	87%	54%	0%

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