



## **The Effect of State Policies on the Market for Private Nongroup Health Insurance**

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## **Abstract**

In the 1990s, several states adopted community rating to improve perceived inefficiencies in their nongroup health insurance markets. Using data from the Survey of Income and Program Participation, Lo Sasso and Lurie find that community rating was associated with older, unhealthier individuals being more likely to be covered by nongroup health insurance. By contrast, among younger, healthier individuals, community rating was associated with a reduction in the likelihood of being covered by nongroup insurance. Conversely, they find that community rating was associated with a rise in uninsurance rates for younger, healthier individuals and a reduction in uninsurance rates for older, unhealthier individuals. The results suggest that the enrollees as a group were sicker after community rating was implemented. The authors also find evidence of insurers trying to alter their products to regain a measure of risk selection ability after community rating eliminated medical underwriting as a market segmentation tool. They find that HMO penetration in the nongroup market increased disproportionately in states that implemented community rating relative to states that did not.

## **I. Introduction**

The non-group health insurance market has in recent years attracted renewed interest as a potential means of reducing the number of uninsured persons in the US, which reached 43.6 million in 2002 (Mills and Bhandari 2003). Among the policy proposals under discussion are efforts to create a tax credit for the purchase of non-group health insurance. Despite this resurgence of interest, there are a number of unanswered questions regarding the non-group market for health insurance (Nichols and Pauly 2002). Among the issues still in dispute is whether state efforts in the early- to mid-1990s to reform the non-group market led to adverse selection in the non-group market. Our goal is to identify the impact of state-level non-group insurance market reforms on the decision to purchase non-group insurance throughout the 1990s and how the composition of the risk pool changed as a result of the reforms, and the extent to which insurers altered their insurance products as a result of community rating.

Non-group reforms implemented by states ranged from pure community rating to more modest policies such as pre-existing condition limitations and guaranteed issue policies. Our research differs from prior work because we estimate how the impact of the reforms, specifically the most severe policy initiative, community rating, varies by age and health status of individuals in an effort to determine whether the reforms served to induce some people to purchase non-group coverage and other people to drop non-group coverage, and whether we observe reciprocal effects on uninsurance.

We find that the implementation of community rating, which prevented insurers from charging different rates regardless of age, gender, or health status, was associated with older, unhealthier individuals being more likely to be covered by non-group health insurance. By contrast, among younger, healthier individuals community rating is associated with a reduction

in the likelihood of being covered by non-group insurance. Conversely, we find the community rating is associated with a rise in the rate of uninsurance for younger, healthier individuals and a reduction in the rate of uninsurance for older, unhealthier individuals. These results are further supported by examining the impact of community rating on the health status characteristics and health utilization of persons with non-group insurance before and after community rating, which suggests that the enrollees as a group were sicker after the implementation of the community rating laws. We also find evidence supportive of the fact that insurers attempted to alter the products they offered in order to regain a measure of risk selection ability after community rating eliminated medical underwriting as a tool to segment the market by risk status. We find that HMO penetration in the non-group market increased disproportionately in states that implemented community rating relative to states that did not implement community rating.

## **II. State Reforms**

During the early 1990's the small group and non-group health insurance markets were a hotbed of regulatory efforts aimed at improving the perceived inequities and inefficiencies of these markets. While small group reform efforts were more common, in many cases the small group reforms were done in tandem with similar reforms implemented in the non-group health insurance market.

Excluding guaranteed renewal, which was mandated as part of the federal Health Insurance Portability and Accountability Act (HIPAA) passed in 1996, thirty-three states implemented some type of reform affecting the non-group health insurance market during the 1990s (Blue Cross and Blue Shield Association, 2000). The reforms included guaranteed issue requirements, limits on exclusions for pre-existing conditions, reinsurance requirements,

minimum loss ratio requirements, and premium rate restrictions. It is clear that each of these reforms is likely to have a distinct effect on the market for non-group health insurance. For example, limiting an insurer's ability to exclude coverage for certain pre-existing conditions is likely to marginally increase premiums for all non-group policies (Marsteller, et al. 1998). Our strategy, however, is to focus on reforms that are likely to have the most unambiguous effects on insurance markets: premium-rating restrictions, specifically community rating of non-group premiums. Pure community rating requires insurance carriers to charge the same premiums for all plan participants regardless of age, gender, health status, or other factors. Most states implemented modified community rating laws, which still allowed premiums to vary to a limited extent; for example, in the case of New York premiums are allowed to vary by region of the state. We will only focus those states with the tightest restrictions on premiums.<sup>1</sup> By restricting the ability of insurers to charge differential premiums by risk category, states intended to create a system in which younger and healthier enrollees explicitly subsidize the premiums of older and unhealthier enrollees. However, this policy is only effective if the young and healthy remain in the market.

Using a variety of sources we summarize the states that implemented some form of community rating requirements in the non-group market at some point during the period the 1990s<sup>2</sup>:

- April 1993: New York implemented an adjusted community rating. Rating differentials were only allowed for geographical region (Hall 2000a).

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<sup>1</sup> By classifying states with milder forms of rating restrictions as “non-community rated” we may tend to bias our findings of the impact of community rating towards zero.

<sup>2</sup> Several other “small” states implemented rating restrictions during the 1990s. For example, North Dakota implemented a community rating plan in 1995. We are forced to ignore these states because, as discussed below, our data source does not allow us to identify some smaller states.

- July 1993: Vermont implemented modified community rating. The premiums for commercial indemnity plans could vary by +/- 20% for demographic factors, but not health status. HMOs and Blue Cross plans were not allowed to use any rating differentials (Hall 2000b).
- August 1993: New Jersey implemented a pure community rating for 6 standardized plans: 5 indemnity plans and one HMO plan (Swartz and Garnick 2000).
- December 1993: Maine implemented an adjusted community rating. The premiums could vary by +/- 50% of the community rate for age, smoking status, occupation, industry and geographic areas (Maine Bureau of Insurance, 2001).
- January 1995: New Hampshire implemented modified community rating in the non-group market. Premium rating was allowed vary by age by a 3:1 ratio (GAO 1996, Feldvebel and Sky 2000).
- January 1996: Washington implemented modified community rating in the non-group market. Age-related rating was allowed and carriers could give up to 10% premium differences for health and “wellness” related characteristics (Kirk 2000).
- July 1996: Kentucky implemented modified community rating in the non-group market. Rating was originally allowed to vary by a ratio of 3:1 based on age, geography, and family composition, but not by health status or claims experience (Kirk 2000). Later, premium variation was allowed to vary by a ratio of 5:1 and differential rating for gender was allowed, but the premiums could not vary by greater than 50%.<sup>3</sup>
- August 1996: Massachusetts implemented modified community rating in the non-group market. Rating is allowed to vary by age, geographic region, and family composition, but

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<sup>3</sup> Kentucky’s experience is somewhat unique because there was a reportedly widespread exodus of health insurance carriers in the state following the implementation of the reform (Kirk 2000). As a check on the sensitivity of our results, we will exclude Kentucky from our regression models.

not health status. Rating variation for age is not allowed to vary by more than  $\pm 33\%$  of the base premium. Only eligible individuals who do not have access to a group policy are able to participate in this market. Insurers are obligated to offer at least one of three standardized plans in the non-group market that vary by the degree of managed care (Kirk 2000).

In all of the above cases community rating is combined with guaranteed issue requirements; that is, a requirement that insurance carriers offer a health insurance policy to any interested party. If the requirement that insurers must issue a policy to any potential customer is not combined with community rating it is unclear whether the policy will have any effectiveness because carriers can simply charge a prohibitive premium. Likewise, community rating without guaranteed issue is also unlikely to have a broad impact as carriers can simply not offer a policy to potentially risky individuals. Nonetheless, as a sensitivity analysis, we will also include New Mexico (January 1995), Oregon (October 1996), and Ohio (January 1993), which implemented some sort of community rating mechanism *without* guaranteed issue.

It is important to note that all states that implemented community rating mechanisms in their non-group markets all generally simultaneously implemented similar policies in the small-group health insurance market. This will allow us to examine to a limited extent the degree to which there are spillover effects from the small-group market that affect the non-group market. To identify the impact of non-group community rating, our regression models will include an indicator for the presence of small-group community rating laws in the state. This indicator is identified because many more states implemented community rating in the small-group market than the non-group market.

### **III. Previous Research**

Several studies have examined aspects of the non-group reforms in the 1990s. Zuckerman and Rajan (1999) used data from the CPS aggregated to the state-level to examine the impact of small- and non-group reforms. The authors found that non-group market reforms, which were aggregated into “packages” of large and small reforms, resulted in higher uninsurance levels and lower levels of non-group coverage. The authors conclude that their findings are consistent with the view that people chose to wait until they needed health insurance or that there was a decrease in the number of carriers willing to offer non-group policies in the regulated markets. A shortcoming of this aggregate work is that the approach does not allow for the authors to distinguish compositional changes within pool of those covered by non-group policies after implementation of the reforms.

Several studies have examined the non-group reforms using individual-level data. Percy (2000) used data from the CPS to examine the impact of state market reforms in the small- and non-group markets. The author aggregates reforms into strong and weak reform types; strong reforms are considered any state reform that included rating restriction combined with guaranteed issue provisions. The CPS prior to 1996 does not contain health status indicators, thus it is difficult to judge the risk associated with individuals. However, Percy stratifies between high and low risk by using predicted expenditures based on a regression of health care expenditures on age, gender, and race using the National Medical Expenditure Survey. Because no personal health status information enters the equation the stratification is not significantly different from simply stratifying by age. In a model that further stratifies by income, Percy finds that strong non-group reforms were associated with less private coverage for low-income groups.



In another study, Sloan and Conover (1998) used CPS data to examine the effect of community rating in the non-group market among other policy variables. They found that non-group community rating did not impact uninsurance using age as a risk status proxy, though they did find that for persons over 55 years of age community rating was associated with a higher rate of group health insurance coverage. However, the authors found that community rating in the non-group market was associated with a lower rate of private coverage, which they speculate could be the result of a decrease supply of insurance.

In addition to these studies of the non-group reforms, a number of other studies have examined the small group market reforms. These studies have been well summarized elsewhere (see, for example, Simon 2000). These studies have generally provided a mixed portrait of the impact of the small-group reforms, with results ranging from evidence of reductions in the rate of private coverage (Simon 2000) to no impact of pure community rating in the small-group market (Buchmeuller and DiNardo 2002).

There are a number of shortcomings in the previous work. First, despite the large amount of work examining the small-group reforms, it is difficult to draw conclusive inferences from studies of the small group reforms because the studies have typically not been able to compare small employers who were likely to benefit from small group reforms (such as firms employing a number of older, sicker individuals) to small employers who were likely to be hurt by the reforms (such as firms that employ younger, healthier individuals). Consequently, the estimates often aggregate across the positive and negative effects, thus it is not surprising that the studies have uncovered modest or no effects of the reforms.

The second general concern regarding prior studies is that the data used—typically the CPS—do not contain sufficient detail regarding the respondent's health status and the timing of

their insurance coverage. Our work will attempt to rectify these shortcomings by studying non-group reforms, which are likely to have the clearest impact on coverage, and by using the Survey of Income and Program Participation (SIPP) and the National Health Interview Survey (NHIS), which include measures of insurance coverage, health status, and utilization.

#### **IV. Conceptual Framework**

Under the assumption of actuarially fair health insurance, beneficiaries pay a premium equal to the expected health care costs of the risk class to which they have been assigned. Whether in the absence of state regulations the non-group health insurance market behaves in this fashion is subject to debate (see Nichols 2000). However, we assume for the purposes of explication that the non-group market in the absence of rating restrictions exhibits basic relationships that offered premiums are increasing in both the age of the applicant and as the applicant's health status worsens. In other words, holding the quantity of health insurance constant, younger, healthier individuals can expect to pay lower premiums than older, unhealthy individuals.

Community rating eliminates the insurance company's ability to risk-rate non-group health insurance policies, thus the intent of the law is to force insurers to develop a product that creates a pooling equilibrium. Thus, community rating in the non-group market can be expected to, at least initially, increase premiums for younger and healthier persons relative to what they would have paid in the absence of community rating and decrease premiums for older, unhealthier persons. In the abstract, holding constant the responses that both individuals and insurers will have, the policy will increase access to insurance coverage for those persons who previously found themselves without options in the non-group market. Of course, individuals

who experience higher premiums as a result of community rating will be inclined to drop their non-group health insurance policies in response. Losing healthier individuals from the pool will further worsen the risk pool and result in still higher premiums for the remaining covered persons. This process is the adverse selection death spiral.

Our data do not allow us to observe actual non-group premiums, let alone hypothetical non-group premiums for persons who do not have non-group coverage. Lacking premium information, we infer high and low premiums groups by risk status, which will be defined by combining information on age and self-reported health status. We will use this information to segment the sample into “younger and healthier” and “older and unhealthier” groups to test the impact of community rating in the non-group market. In addition to examining take-up of non-group insurance, we will attempt to verify the prediction of the conceptual framework by examining utilization of health care services and more detailed health status measures available in the NHIS.

The second and more subtle possible response to community rating by insurance companies will be to attempt to create a separating equilibrium in the non-group health insurance market by altering the characteristics of insurance product they sell in order to appeal to healthier individuals. The idea behind the implementation of guaranteed issue and community rating was to prevent medical underwriting to be used as a strategy for risk selection. However, the policy did not eliminate the incentives to attract the low risk individuals. One measurable way in which carriers could alter the product is to offer HMOs, which may be eschewed by the unhealthy out of concerns about accessing needed specialty care or not having access to their primary care physician. These concerns would likely not be as strong among the healthy. Anecdotally, we know that one of the impacts of community rating in the non-group market was exit of indemnity

insurers (Kirk 2000, Hall 2000a), but this could have represented the general trend in the US at the time or a trend in the particular state in question. Buchmueller and Liu (2003) investigated this potential phenomenon in the small group market and found evidence that HMO penetration was related to small group insurance reforms. We will examine this hypothesis in the non-group market using individual level data from the NHIS and methods to control for the general trend in the health care marketplace towards the use of HMOs in the early 1990s as well as the trend in the states that implemented community rating during this time period. Unlike Buchmueller and Liu, our study will measure actual take-up of HMO products in the non-group market, not area HMO penetration.

## **V. Non-Group Take-Up and Uninsurance Effects**

To examine take-up of non-group insurance and uninsurance, we use data from the Survey of Income and Program Participation (SIPP) for the years 1990-2000. The SIPP data follow a nationally representative sample of individuals over a 2-and-a-half to 4 years period.<sup>4</sup> Respondents are surveyed every 4 months and for many variables (such as health insurance coverage) are questioned about each of the previous 4 months since the last interview wave. The SIPP data have several advantages relative to other data sets. First, successive panels of the data can be used to straddle the period before and after the implementation of the reforms identified in the previous section. We use data from the 1990, 1991, 1992, 1993 and 1996 SIPP panels. Second, because we believe it is essential to separate high-risk individuals from low-risk individuals not only by age but also by their perceived health status, the SIPP data have contained a self-reported health status question that allows respondents to rate their health as

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<sup>4</sup> Starting with the 1996 panel, the follow-up period for SIPP respondents is 4 years; prior panels employed a 2.5-year follow-up window and overlapping panels.

excellent, very good, good, fair, or poor since the 1990 panel.<sup>5</sup> We include data from SIPP waves when the self-reported health question appeared so that health insurance coverage could be as contemporaneous as possible to the health status measure. Self-reported health was assessed twice in the 1990 panel (waves 3 and 6), once in the 1991 panel (wave 3), twice in the 1992 panel (waves 6 and 9), twice in the 1993 panel (waves 3 and 6), and 6 times in the 1996 panel (waves 3, 5, 6, 9, 11, and 12). All time-varying information—health status, current employment, health insurance, and family status—correspond to the current month of the reported information.

Table 1 displays the number of observations for persons between the ages of 18 and 64 for the month-years corresponding to when the survey included self-reported health. By combining SIPP panels we have nearly 400,000 person-months of data on self-reported health and health insurance coverage. A number of aspects of this table are noteworthy. First, we have two years, 1990 and 1991, encompassing roughly 80,000 observations, of pre-reform data. In 1992, the SIPP panels did not include the self-reported health questions. Also significant is the nearly two-year gap in self-reported health measures from the twelfth month of 1994 and the eleventh month of 1996. Thereafter, self-reported health is assessed with greater frequency. However, during this gap 4 of the 6 reform states that are identifiable in the SIPP implemented their community rating reforms. Because we have ample pre- and post-reform data for these states, we do not anticipate that the interruption in the time series will pose a threat to our analyses.

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<sup>5</sup> By way of comparison, the CPS data only began including self-reported health in the questionnaire in 1996.

The health insurance information contained in the SIPP allows us to construct measures of non-group health insurance coverage.<sup>6</sup> Table 2 displays population weighted means of health insurance coverage over time for 18 to 64 year olds in the 41 identifiable states in the SIPP. Note that despite the measurement change between 1994 and 1996, there is not a dramatic change in the average level of non-group coverage. The trend in non-group coverage conforms to the well-documented secular decline in non-group coverage observed in other data sets, such as the CPS (Mills 2000).

The SIPP data have a few notable disadvantages. The first is the relatively small sample sizes, particularly when examining individual state effects for non-group coverage given that such policies cover relatively few individuals. However, by combining successive panels of data, we are able to construct reasonably sized samples for our analysis. Another issue is that the public use data file masks the identity of 9 low-population states. We are forced to drop the data for these non-exclusively identified states. A final weakness of the SIPP is that the survey only inquired about firm size in the 1996 panel, which prevents us from distinguishing between small and large group coverage.

To determine the impact of non-group community rating laws, we specify a basic difference-in-differences model of non-group health insurance coverage:

$$Non-Group_i = \alpha NGCR_i + \mathbf{X}_i \boldsymbol{\beta} + \sum \gamma_s state_i + \sum \gamma_t time_i + \varepsilon_i, \quad (1)$$

where Non-Group represents whether the individual is covered by a non-group health insurance policy, NGCR is the key policy variable of interest reflecting whether the state in which the person resides has community rating in the non-group market. In addition the model controls for

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<sup>6</sup> The earlier SIPP panels (1990-1993) non-group coverage was inferred from an “other private” category. In the redesign of the 1996 SIPP a “privately purchased” option was added, thus allowing us to directly observe non-group coverage. Despite the change in the survey, we do not anticipate that the measurement issues will pose a significant problem because there is no reason to suspect that any measurement changes would be correlated with specific states’ reform policies.

individual demographic characteristics including age, race, gender, education, marital status, the presence of children under 18, and urban versus rural residence. The model also includes state and time fixed effects. Because Non-Group is an indicator variable, we will use a probit regression to estimate the model.

Table 3 displays descriptive characteristics of the SIPP sample, stratified by insurance coverage. Relative to those with group coverage, non-group enrollees are much more likely to be self-employed and tend to be older, are more likely to be white, are less likely to be employed, tend to be poorer, and are less likely to be married and have children under 18 years old. The characteristics of those with public coverage and those without insurance coverage conform to expectations.

Table 4 displays probit non-group and uninsurance regression results for the full SIPP sample. Note that in column 1 the coefficient for the non-group community rating variable in the non-group coverage regression is small and not significantly different from zero. Similarly note that the coefficient for the non-group community rating variable in the uninsurance regression is also small and not significantly different from zero. In the specification that controls for the presence of community rating in the small-group health insurance market, we see that non-group community rating has no impact on non-group coverage or uninsurance. However, it is interesting to note that small-group community rating has a marginally significant positive effect on non-group coverage.

The positive effect of the small-group reforms on the non-group market would appear to be consistent with a spillover relationship between the two markets. Specifically, if community rating in the small-group market resulted in small employers dropping their health insurance or otherwise making their offered health insurance unappealing to employees the result would be

more potential customers for non-group health insurance, holding constant the community rating status of the non-group market. If this story is accurate, we would expect to see uninsurance increase coincident with the implementation of the small-group community rating regulations. However, the results in the fourth column of Table 4 indicate that community rating in the small-group market had a negative though insignificant effect on uninsurance.

Table 5 displays probit non-group and uninsurance regression results for the “healthy” subsample of the SIPP data set. In this instance we define healthy as men between the ages of 22 and 35 years old in self-described excellent or very good health. We see for this group that community rating in the non-group market was associated with a large statistically significant decrease in the probability of having non-group health insurance. Relative to the mean percentage of this subsample that held non-group coverage of 5.4%, the marginal effect of the coefficient of  $-2.0\%$  implies a decrease in non-group coverage of 37%. When we control for the presence of small-group community rating the effect of non-group community is  $-2.9\%$ , which is a decrease in non-group coverage of roughly 54%.

The impact on uninsurance is similar in magnitude. In columns 3 and 4 of Table 5 we see that community rating in the non-group market was associated with an increase in the probability of being uninsured for the healthy subsample. Column 3, which displays probit results without controlling for the presence of community rating in the small-group market, indicates that the healthy experienced a 3.9% increase in the probability of being uninsured. Relative to the average rate of uninsurance in this subsample of 30% this effect represents a 13% increase in the rate of uninsurance. When we control for the small-group reforms, the marginal effect increases to 6.3%, which is a 21% increase in uninsurance.



In Table 6 we display a number of alternate specifications using different definitions of the healthy subsample. While not always statistically significant, the results together tell a compelling story about the robustness of our findings. In virtually all specifications, we find that community rating in the non-group market was associated with lower levels of non-group take-up and higher levels of uninsurance for the healthy. It should also be noted that in a number of specifications we observe the non-group community rating laws and small-group community ratings exerting opposite impacts on the coverage measures. While the positive impact of small-group community rating on non-group coverage is consistent with a spillover story, the negative effect of small-group community rating on uninsurance is somewhat counter-intuitive.

Table 7 displays results for the “unhealthy” subsample from the SIPP data. We define unhealthy here as persons 40 and over with no children in self-described poor health. In the first column we observe that community rating in the non-group market was associated with a statistically significant increase in the probability of taking up non-group coverage. Relative to the mean percentage of unhealthy persons who have non-group coverage in our sample of 8.9%, the marginal effect of 4.5% suggests that community rating increased coverage of the unhealthy by roughly 50%. When we control for community rating in the small-group market the non-group community rating effect size remains largely unchanged. The uninsurance regressions in columns 3 and 4 conform to expectations in that non-group community rating is associated with a statistically significant reduction in the probability of the unhealthy being uninsured. Given the mean percentage of uninsured persons in the unhealthy subsample of 15.7% the marginal effect associated with community rating of  $-7.4\%$  suggests a nearly 50% reduction in the probability of being uninsured. When we control for small-group community rating the effect size and

statistical significance of non-group community rating diminish, but the direction of the coefficient is still negative.

Table 8 displays results for the key coefficients using alternate definitions of unhealthy. Note that the results under different specifications are not as robust as the alternate specifications of the healthy. There are several potential reasons why the findings for the unhealthy subsample are less robust than the findings for the healthy subsample. First, statistical power is a concern: as seen in Table 3, there are comparatively few unhealthy persons in the sample. This is especially true when we restrict our attention to unhealthy persons with non-group policies in states with community rating. Thus, we feel that the fact that the results consistently point in the direction of higher non-group take-up and lower uninsurance for all definitions of the unhealthy is meaningful. Moreover, to show adverse selection in the non-group market it is merely sufficient to show that healthy persons left the market and that the number of unhealthy persons stayed constant. We believe our results in this portion of the analysis are consistent with this requirement.

## **VI. Impact of Community Rating on Health Status, Health Care Utilization, and HMO Enrollment in the Non-Group Market**

Given the strong effects observed at the tails of the health distribution, it is likely that the impact of the shift in the risk pool had implications for the overall health status and health care utilization among persons in the non-group health insurance market. In addition, it is also possible that insurance companies may have responded to the regulations by altering the type of products they offer in the non-group market to retain some ability to risk-segment. Because the SIPP data lack detailed health status and utilization information as well as information on the

type of non-group insurance purchased (HMO versus other), we will use a special public release version of the National Health Interview Survey (NHIS) for the years 1992 and 1994 that includes state identifiers to examine a subset of the community rating laws. The NHIS provides data for a representative sample of households in the United States. The NHIS is one of the main sources of data on the health of the civilian non-institutionalized population in the United States. Surveys are conducted in person and include general demographic information on the household and family as well as detailed individual-level information on adults in the household. The NHIS also includes information on health care utilization, health status, and health insurance, all of which are described in more detail below.

Unfortunately, the publicly released NHIS data omits state identifiers, which makes it impossible to study state differences. However, in the early 1990s, the National Center for Health Statistics, which collects the NHIS, released a set of limited files known as the NHIS State Data Files that include most state identifiers. Two groups of small states were aggregated to prevent the possibility of identifying individuals; Alaska, Idaho, New Mexico, Nevada and Wyoming were combined into one category and South Dakota, New Hampshire and West Virginia were combined into a second category. In addition, North Dakota and Nebraska were not sampled at all in the 1992 and 1994 NHIS State Data Files. The restrictions leave 41 identifiable states (including Washington DC), as well as two aggregated groups of states. Beyond containing state identifiers, the primary difference between the publicly released full NHIS and the State Data File version is the intentional inclusion of “statistical noise” at the variable and record levels. Specifically, most continuous variables were recoded into categorical and ordinal measures and only limited information on family structure and composition was included in the files. Despite the data limitations placed on the State Data Files, the supplement

contains sufficient measures of health and utilization combined with the state identifiers to allow us to study the impact of the early community rating laws that occurred in 1993 in Maine, Vermont, New York, and New Jersey.

We can split the health measures available in the NHIS into two categories, health status during the year and utilization of health care services. In addition to self reported health the health status measures include more objective measures of health such as activity limitation status (total, ability to work, and need of help with personal care), restricted activity days in past two weeks due to injury or sickness (total, days in bed, work loss days, and other days of restricted activity), and the number of chronic conditions. The utilization of health care services includes number of doctor visits (past 12 months, past two weeks) and days of short-term hospital stay. In addition, respondents are asked whether their insurance coverage is an HMO or not.

The demographic variables of our target population (adults ages 18-64) are presented in Table 9. The table shows that the 1992 sample is a little larger but almost every aspect the distribution of individuals by each demographic characteristic is very similar. The period from 1992 to 1994 was a year of expansion in the general economy, thus it is not surprising to observe increases in private coverage and decreases in public coverage and uninsurance.<sup>7</sup> The descriptive statistics indicate that just over 7% of the sample of non-elderly adults had non-group coverage.<sup>8</sup>

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<sup>7</sup> In general the surveys are quite similar across the two years, though there is a slight difference in how the questions on private health insurance were phrased. In 1992, respondents are asked to list any health insurance plan that pays any part of hospital or doctor bills, they are asked not to include plans that pay for only one type of services. The 1994 questionnaire first asks for any private health insurance plan and then distinguishes between “single service plans” and “non-single service plans”. In our sample we included single service plans in the definition of a private health insurance plan, but our results hold when we exclude single service plans.

<sup>8</sup> The definition of non-group coverage used in our analyses was based on the primary insurance policy mentioned by the respondent. That is, some respondents indicated they were covered by both group and non-group policies; we assigned people to coverage categories based on what they listed as their primary policy.

Our goal is to use the NHIS data for 1992 and 1994 to do pre/post comparisons between the four states that implemented community rating with guaranteed issue in their non-group markets in 1993 and the rest of the country. Although other states (Ohio, Minnesota and Connecticut) had some policy changes in their non-group markets that year none of them were as dramatic as the regulations in the four community rating states. Hence, using individual level information on health insurance, utilization, health measures and demographic controls enables us to use a pre/post framework to estimate at least the short-run effect of the policy change. The general structure of our analytic models will be difference-in-differences (DD): that is, as in the above take-up and uninsurance analyses, we will compare the changes in outcomes over time for states that implemented the community rating to changes in outcomes for states that did not implement community rating:

$$Outcome_i = \alpha NGCR_i + \mathbf{X}_i \boldsymbol{\beta} + \gamma_i time_i + \sum \gamma_s state_i + \varepsilon_i, \quad (2)$$

where NGCR takes the value of one in 1994 for states that implemented community rating and zero otherwise, X represents demographic controls, time is a dummy variable equal to one in 1994, and state represents a series of state fixed effects. As before,  $\alpha$  represents the key coefficient of interest in our regression estimates. Our analyses will condition upon having non-group coverage and will explore the relative change in the composition of the non-group market in states that implemented community rating compared to states that did not.

A possible limitation of the DD approach is that there may have been changes in the states that implemented community rating that affected the entire insurance market. Consequently, only comparing relative changes in the non-group market could lead to biased inferences. We propose to use the group market as another control on which to base conclusions

about the impact of the non-group reforms. By including persons covered by private group insurance in our model<sup>9</sup>, we derive a difference-in-difference-in-differences (DDD) model:

$$\begin{aligned} Outcome_i = & \alpha NGCR_i + \theta Non-Group_i + \delta NGCR_i \times Non-Group_i + \mathbf{X}_i \boldsymbol{\beta} + \gamma_t time_i \\ & + \sum \gamma_s state_i + \varepsilon_i, \end{aligned} \quad (3)$$

where Non-Group is an indicator for individual having non-group coverage. The non-group indicator is the interacted with the non-group community rating reform indicator, which provides us with the DDD estimate of the impact of non-group community rating.

**Health Measures.** Table 10 presents descriptive statistics displaying each of the health measures available from the NHIS State Data Files. Self-reported health is acquired in the same manner that it was acquired in the SIPP: a 5-point scale reflecting excellent, very good, good, fair, or poor health. Total activity limitation is assessed as unable to perform major activity, limited in the kind or amount of major activities that can be performed, limited in other activities, or no limitations on activities. Ability to work is assessed as unable to work, limited in the kind or amount of work, limited in other activities of work, or no limits on ability to work. Total number of restricted activity days in the last two weeks is a count that is top-coded at 4. The number of days restricted to bed and the number of other restricted activity days in the last two weeks is either zero or one, reflecting a positive number of days. The number of bed days in the last 12 months is coded as a count. The number of doctor visits in the last two weeks is a count top-coded at 2 and the number of doctor visits in the last year is a count top-coded at 11. The

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<sup>9</sup> Recall that the NHIS data do not allow us to distinguish large-group from small-group coverage. Because all states that implemented non-group community rating also implemented small-group reforms, some of the people in the group coverage control group will have been affected by reforms. This makes those with group coverage a less than ideal control group. However, to the extent that those with small-group coverage will experience the same effects that those with non-group coverage experience, our results will be biased towards a more conservative estimate of the true impact of non-group community rating.

number of hospitalizations in the last two weeks is a count top-coded at 4. For our purposes we will transform hospitalizations into an indicator variable.

Note that in virtually all cases the mean changes between 1992 and 1994 in the non-group community rating states in a manner consistent with worsening health. Also note that there are generally not corresponding changes in the two control groups: the pre and post change in the non-community rating states and the pre and post changes in the group health insurance coverage persons. For example, the mean number of total restricted activity days in the past two weeks was 0.179 in the (future) community rating states in 1992 and 0.443 in 1994 once community rating was in place in the non-group market in these states. By comparison, the non-community rating states increased negligibly from 0.272 to 0.291. Likewise, there was no discernable trend in the group market for restricted activity days over the comparable period. Similar patterns are apparent for each of the other variables. However, these descriptive statistics represent unconditional means and, while suggestive, are not by themselves conclusive.

Table 11 displays the regression results for the above health measures with an increasing set of controls included in the specification. The regressions contain a full set of demographic control variables though we only display the key coefficients on interest for brevity. A full set of regression results is available upon request. The first column displays the simple pre/post difference in the outcome variable. The second column displays results using the DD specification that uses persons covered by non-group insurance in states that did not implement community rating as a control. The third column displays results using the DDD specification that differences the DD result by the relative change in the outcome variable for the group enrollees across the two sets of states. As anticipated based on the descriptive statistics, there is a clear trend towards less healthy persons having non-group health insurance as a consequence of

community rating. Community rating in the non-group market is associated with enrollees having significantly more restricted activity days and bed days, and a greater number of doctor visits and hospitalizations.

***HMO Take-Up.*** Using methods similar to the above approach to examining health status and utilization, we now turn to the issue of HMO penetration. As described earlier, there are reasons to believe that insurance companies could achieve risk segmentation by altering the nature of their product in order to appeal to different risk groups. Because HMOs may disproportionately appeal to healthier individuals, insurers could continue to abide by community rating laws while offering a product that has a higher probability of enrolling better than average risks. We test this hypothesis using the NHIS State Data Files for 1992 and 1994.

Table 12 displays means of HMO penetration in community rated states and non-community rated states in 1992 and 1994 for person covered by both non-group and group health insurance policies. In the full sample, we see that the percentage of HMO policies in the non-group market increased from 18.6% to 26.6% while the HMO penetration remained virtually unchanged in the non-group market for states that did not implement community rating. However, in the states that implemented community rating there was an increase in HMO penetration in the group market from 30.5% to 39.6%, though that increase was in part matched in the group market for non-community rated states, which increased from 35.4% to 39.9%. This highlights the importance of estimating the DDD models, which uses the change in the group market as an additional control for the relative change in the non-group market.

We split the sample into older and younger subsamples because we believe that HMOs could be more appealing to (and more likely to be targeted at) younger individuals. We observe similar patterns in the data for the two age-based subsamples, though, as anticipated, the



increases in HMO penetration are larger for the younger cohort. For example, for the older cohort in the community rated states we observe an increase in HMO penetration from 30.5% to 34.8%, while in the younger cohort we observe an increase in HMO penetration from 17.7% to 29.2%. A drawback of this stratification, however, is the relatively small sample sizes that result. The fact that the young non-group enrollees in the community rated states only numbered 243 in 1992 and 171 in 1994 could pose power issues in our multivariate models.

Table 13 displays results for models similar to those displayed in Table 11. We estimated a simple pre/post difference model, a DD model using states that did not implement community rating as a control group, and a DDD model further differencing the DD model by the relative change in HMO penetration that occurred in the group health insurance market. We display full sample results and results stratified by age group to highlight any differences between younger and older enrollees. In the first column the simple difference results appear consistent with the means observed in Table 12. Overall there is a 7% rise in the rate of HMO penetration in states that implemented community rating in their non-group market; the change for the older group is not statistically significant while the younger group has a statistically significant rise in the HMO penetration of 8.5%. The DD results are similar except that the HMO penetration change for the older group is now statistically significant though the magnitude of the change is nearly identical to the difference results (4.8%). The DDD results indicate a marginally significant increase in HMO penetration overall of 5.4%. The coefficients for the older and younger subsamples are not significant, though the directions of the effects are consistent with our expectations.

It is worth noting that because all the states that implemented community rating in their non-group markets also implemented community rating in their small-group markets, we can expect that some members of the group coverage subsample were affected by the same trend in

HMO penetration (which was, for example, documented by Buchmueller and Liu, 2003). Consequently, because we cannot separately identify small-group enrollees from large-group enrollees in our NHIS sample, our findings should be thought of as a conservative, lower-bound estimate of the impact of community rating in the non-group market.

## **VII. Discussion**

Our results suggest that community rating of the non-group health insurance market was associated with a dramatic change in the risk composition of the non-group market. Using data from large, national surveys we found that community rating made healthy people less likely to be insured by non-group policies and unhealthy people more likely to be insured by non-group policies. At the same time, the healthy were more likely to be uninsured and the unhealthy were less likely to be uninsured. Our non-group take-up results are further supported by examining the impact of community rating on the health status characteristics and health utilization of persons with non-group insurance before and after community rating, which suggests that the enrollees as a group were sicker as a result of the community rating laws. We also found evidence supportive of the fact that insurers attempted to alter the products they offered in order to regain a measure of risk selection ability after community rating eliminated medical underwriting as a tool to segment the market by risk status. We found that HMO penetration in the non-group market increased disproportionately in states that implemented community rating relative to states that did not implement community rating.

Our results are clearly consistent with the adverse selection hypothesis regarding the non-group health insurance market. Earlier work by Browne and Doeringhaus (1993) using data that pre-date the non-group reforms suggests that the non-group health insurance market is

characterized by a great deal of risk segmentation between low and high risks, thus it is not surprising that low risks would drop their coverage and prefer to be uninsured as a result of the increases in premiums that inevitably accompany community rating. Also consistent with our results is that currently healthy people have greater freedom to drop coverage until they become sick.

If the goals of the non-group regulations were not to increase coverage, but instead to allow the relatively unhealthy to gain access to the market for health insurance, then the community rating laws could be considered a success. One of the limitations of our study, however, is that we do not have sufficient data to examine trends over time in the impact of community rating. If the average effects we observed are any guide, we would expect the adverse selection in the market to continue to worsen over time and eventually for the market itself to become untenable. Under that circumstance, it is not clear that the reforms could be considered anything more than a temporary solution to the problem of insuring those with the greatest need for medical care services. Moreover, to the extent that insurance coverage is an important determinant of health, at least in the long run, the impact of increasing uninsurance among the (currently) healthy is unclear. These individuals who are priced out of the market in the short run could suffer from the lack of access to care that results from being uninsured.

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**Table 1: Sample Sizes in the SIPP by Year and Month**

<i>Year\Month</i>	<i>1</i>	<i>2</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>Total</i>
1990	0	0	0	0	6,904	6,882	6,907	6,893	27,586
1991	0	0	0	0	11,157	10,958	10,883	10,915	43,913
1992	0	0	0	0	12,024	11,915	12,009	12,091	48,039
1993	0	0	0	0	11,611	11,652	11,523	11,667	46,453
1994	0	0	0	0	0	0	10,557	10,604	21,161
1995	10,608	10,590	9,817	9,910	10,018	9,886	9,572	9,608	80,009
1996	9,562	9,636	0	0	0	0	8,994	9,042	37,234
1997	9,014	9,155	8,712	8,818	9,007	8,973	8,800	8,799	71,278
1998	8,941	8,950	0	0	0	0	0	0	17,891
1999	0	0	0	0	6,904	6,882	6,907	6,893	27,586
2000	0	0	0	0	11,157	10,958	10,883	10,915	43,913
Total									393,564

Note: data from 1990, 1991, 1992, 1993, and 1996 SIPP panels.

**Table 2: Health Insurance Coverage in the SIPP for Individuals Not Enrolled In School**

<i>Year</i>	<i>Non-group</i>	<i>Group</i>	<i>Uninsured</i>	<i>Public</i>
1990	7.11%	69.91%	14.84%	10.04%
1991	6.87%	69.77%	14.94%	10.11%
1993	6.76%	68.44%	15.41%	10.76%
1994	6.46%	69.27%	14.71%	10.78%
1996	6.14%	66.17%	16.28%	12.86%
1997	5.55%	67.79%	16.00%	11.94%
1998	5.50%	69.04%	15.05%	11.61%
1999	5.38%	70.05%	14.53%	11.60%
2000	4.93%	70.49%	14.55%	11.51%

Note: data from 1990, 1991, 1992, 1993, and 1996 SIPP panels. Sample weighted to population. N=393,564.

**Table 3: Demographic information by Health Insurance Coverage for Individuals Not Enrolled in School**

	<i>Non-Group</i>	<i>Group</i>	<i>Uninsured</i>	<i>Public</i>	<i>Full Sample</i>
Sample Size	23,740	271,466	59,697	44,313	393,564
<b>Gender</b>					
Male	46.37	49.29	54.29	40.06	48.51
Female	53.63	50.71	45.71	59.94	51.49
<b>Self Employment</b>					
None in family	55.47	87.94	82.83	93.99	85.71
At least one person	44.53	12.06	17.17	6.01	14.29
<b>Age</b>	45.1	41.1	36.4	42.9	40.6
<b>Health Status</b>					
Excellent	30.11	32.3	24.08	14.32	29.33
Very Good	33.37	37.6	31.78	20.99	34.95
Good	24.15	23.31	30.35	27.7	24.82
Fair	8.48	5.33	10.3	21.73	7.76
Poor	3.88	1.47	3.49	15.26	3.14
<b>Race</b>					
White	86.38	81.22	60.92	62.93	76.52
Black	5.08	8.54	13.88	20.14	10.28
Hispanic	4.51	7.04	20.7	12.41	9.61
Other	4.03	3.19	4.50	4.52	3.59
<b>Head Of Family</b>					
Husband/wife	67.92	75.27	52.04	53.34	68.45
Male	12.43	10.38	20.98	11.95	12.37
Female	19.65	14.35	26.98	34.71	19.17
<b>Employment</b>					
No Full time	33.32	15.07	36.13	65.65	24.33
Full time	66.68	84.93	63.87	34.35	75.67
<b>Income</b>					
Under 100% of Poverty	14.10	3.21	28.83	35.75	11.55
100%-200% of Poverty	19.75	12.26	32.29	23.71	17.07
200%-400% of Poverty	32.43	37.97	27.65	23.12	34.37
Above 400% of Poverty	33.72	46.56	11.23	17.42	37
<b>Urban</b>					
Not part of MSA	43.71	39.68	45.43	44.94	41.29
Part of MSA	56.29	60.32	54.57	55.06	58.71
<b>Married</b>					
Not Married	37.46	28.27	57.38	50.06	35.93
Married	62.54	71.73	42.62	49.94	64.07
<b>Kids under 18</b>					
No Kids	64.66	51.85	60.34	53.02	53.82
With Kids	35.34	48.15	39.66	46.98	46.18

Note: data from 1990, 1991, 1992, 1993, and 1996 SIPP panels.



**Table 4: Probit Regression of Non-Group Coverage and Uninsurance for Full SIPP Sample, 1990-2000**

	<i>Non-Group</i>		<i>Uninsured</i>	
Community Rating: Non-Group	-0.005 (0.026) [-0.06%]	-0.036 (0.032) [-0.38%]	-0.018 (0.022) [-0.36%]	-0.004 (0.027) [-0.09%]
Community Rating: Small-Group	----	0.042* (0.023) [0.46%]	----	-0.018 (0.020) [-0.36%]
Race: Black	-0.380*** (0.019) [-3.20%]	-0.381*** (0.019) [-3.20%]	0.157*** (0.013) [3.38%]	0.157*** (0.013) [3.39%]
Race: Hispanic	-0.393*** (0.021) [-3.27%]	-0.393*** (0.021) [-3.27%]	0.542*** (0.014) [13.73%]	0.542*** (0.014) [13.72%]
Race: Other	0.003 (0.028) [0.03%]	0.003 (0.028) [0.03%]	0.386*** (0.023) [9.41%]	0.386*** (0.023) [9.42%]
Head of Family: Male	-0.212*** (0.023) [-2.00%]	-0.212*** (0.023) [-2.00%]	0.100*** (0.017) [2.11%]	0.100*** (0.017) [2.11%]
Head of Family: Female	-0.224*** (0.022) [-2.15%]	-0.224*** (0.022) [-2.15%]	0.026 (0.017) [0.53%]	0.026 (0.017) [0.53%]
Education: High school Grad	0.048*** (0.012) [0.52%]	0.048*** (0.012) [0.52%]	-0.112*** (0.009) [-2.27%]	-0.112*** (0.009) [-2.27%]
Education: Some College	0.090*** (0.010) [0.98%]	0.090*** (0.010) [0.98%]	-0.550*** (0.009) [-10.44%]	-0.550*** (0.009) [-10.44%]
MSA: Urban	-0.053*** (0.011) [-0.57%]	-0.053*** (0.011) [-0.58%]	-0.131*** (0.009) [-2.67%]	-0.131*** (0.009) [-2.67%]
Gender: Female	0.047*** (0.012) [0.51%]	0.047*** (0.012) [0.51%]	-0.128*** (0.010) [-2.58%]	-0.128*** (0.010) [-2.58%]
Married	-0.309*** (0.021) [-3.58%]	-0.309*** (0.021) [-3.58%]	-0.436*** (0.017) [-9.41%]	-0.436*** (0.017) [-9.41%]
Kids Under 18: Yes	-0.055*** (0.012) [-0.59%]	-0.055*** (0.012) [-0.59%]	-0.045*** (0.010) [-0.90%]	-0.045*** (0.010) [-0.90%]

Notes: Full sample, n=393,564. Robust standard errors in parentheses, marginal effects in brackets. Regressions also include state and year fixed effects, age category indicators, and a constant.

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

**Table 5: Probit Regressions of Non-Group Coverage and Uninsurance for Healthy Subsample from SIPP Data, 1990-2000**

	<i>Non-Group</i>		<i>Uninsured</i>	
Community Rating: Non-Group	-0.252** (0.102) [-2.04%]	-0.390*** (0.122) [-2.89%]	0.112* (0.065) [3.87%]	0.181** (0.082) [6.32%]
Community Rating: Small-Group	—	0.189** (0.088) [1.96%]	—	-0.091 (0.064) [-3.01%]
Age:25-29	-0.029 (0.042) [-0.27%]	-0.031 (0.042) [-0.29%]	-0.135*** (0.028) [-4.54%]	-0.135*** (0.028) [-4.51%]
Age:30-34	0.056 (0.048) [0.54%]	0.054 (0.048) [0.52%]	-0.288*** (0.032) [-9.39%]	-0.288*** (0.032) [-9.38%]
Race: Black	-0.265*** (0.086) [-2.11%]	-0.265*** (0.086) [-2.10%]	0.190*** (0.043) [6.68%]	0.190*** (0.043) [6.68%]
Race: Hispanic	-0.444*** (0.085) [-3.16%]	-0.443*** (0.085) [-3.15%]	0.472*** (0.044) [17.28%]	0.472*** (0.044) [17.28%]
Race: Other	-0.350*** (0.102) [-2.53%]	-0.349*** (0.102) [-2.51%]	0.117* (0.067) [-0.01%]	0.117* (0.067) [4.07%]
Head of Family: Male	-0.279*** (0.044) [-2.86%]	-0.279*** (0.044) [-2.85%]	-0.072** (0.031) [-2.43%]	-0.072** (0.031) [-2.44%]
Head of Family: Female	-0.172*** (0.064) [-1.46%]	-0.174*** (0.064) [-1.47%]	0.195*** (0.044) [6.83%]	0.195*** (0.044) [6.84%]
Education: High school Grad	-0.029 (0.053) [-0.28%]	-0.028 (0.052) [-0.27%]	-0.095*** (0.031) [-3.22%]	-0.095*** (0.031) [-3.24%]
Education: Some College	0.305*** (0.040) [3.02%]	0.305*** (0.040) [3.01%]	-0.563*** (0.027) [-18.43%]	-0.563*** (0.027) [-18.42%]
MSA: Urban	-0.061 (0.041) [-0.59%]	-0.062 (0.041) [-0.60%]	-0.041 (0.028) [-1.37%]	-0.040 (0.028) [-1.36%]
KIDs Under 18: Yes	-0.248** (0.097) [-1.96%]	-0.252** (0.097) [-1.98%]	0.121** (0.058) [4.20%]	0.121** (0.058) [4.21%]
N	20,589	20,589	20,589	20,589

Notes: Healthy subsample defined as men between the ages of 22 and 35 in self-described excellent or very good health. Robust standard errors in parentheses, marginal effects in brackets. Regressions also include state and year fixed effects and a constant.

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

**Table 6: Sensitivity Analyses Using Alternate Definitions of Healthy Persons**

		<i>Non-Group</i>		<i>Uninsured</i>	
Men in excellent health not married between the ages of 22-35	Non-Group CR	-0.369*** (0.132) [-2.98%]	-0.445*** (0.153) [-3.44%]	0.174** (0.085) [5.90%]	0.273** (0.107) [9.43%]
	Small-Group CR	---	0.110 (0.110) [1.17%]	---	-0.136 (0.085) [-4.33%]
Men in excellent health between the ages of 22-35	Non-Group CR	-0.273*** (0.097) [-2.09%]	-0.396*** (0.116) [-2.79%]	0.049 (0.069) [1.20%]	0.136 (0.086) [3.47%]
	Small-Group CR	---	0.171** (0.085) [1.71%]	---	-0.118* (0.066) [-2.75%]
Unmarried Men and women in excellent health between the ages of 22-35	Non-Group CR	-0.253*** (0.097) [-2.07%]	-0.298*** (0.114) [-2.37%]	0.102 (0.066) [3.12%]	0.226*** (0.082) [7.11%]
	Small-Group CR	---	0.066 (0.085) [0.65%]	---	-0.172*** (0.064) [-4.89%]
Men and women in excellent health between the ages of 22-35	Non-Group CR	-0.152** (0.069) [-1.23%]	-0.285*** (0.084) [-2.11%]	0.028 (0.052) [0.60%]	0.128** (0.065) [2.83%]
	Small-Group CR	---	0.185*** (0.062) [1.83%]	---	-0.135*** (0.049) [-2.69%]
Men in excellent and very good health not married between the ages of 22-35	Non-Group CR	-0.252** (0.102) [-2.04%]	-0.390*** (0.122) [-2.89%]	0.112* (0.065) [3.87%]	0.181** (0.082) [6.32%]
	Small-Group CR	---	0.189** (0.088) [1.96%]	---	-0.091 (0.064) [-3.01%]
Men in excellent and very good health between the ages of 22-35	Non-Group CR	-0.161** (0.078) [-1.24%]	-0.273*** (0.095) [-1.94%]	0.044 (0.053) [1.15%]	0.076 (0.066) [2.03%]
	Small-Group CR	---	0.154** (0.067) [1.43%]	---	-0.042 (0.050) [-1.09%]
Unmarried men and women in "Excellent" and "Very Good" health between the ages of 22-35	Non-Group CR	-0.150** (0.074) [-1.22%]	-0.233*** (0.089) [-1.79%]	0.098** (0.050) [3.12%]	0.177*** (0.062) [5.72%]
	Small-Group CR	---	0.115* (0.066) [1.08%]	---	-0.106** (0.048) [-3.21%]

Notes: Robust standard errors in parentheses, marginal effects in brackets. Regressions also include age, race, family structure, education, urban residence, indicator for children present, state and year fixed effects and a constant.

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

**Table 7: Probit Regressions of Non-Group Coverage and Uninsurance for Unhealthy Subsample from SIPP Data, 1990-2000**

	<i>Non-Group</i>		<i>Uninsured</i>	
Community Rating: Non-Group	0.295** (0.150) [4.98%]	0.306* (0.175) [5.21%]	-0.333** (0.138) [-6.34%]	-0.185 (0.168) [-3.77%]
Community Rating: Small-Group	---	-0.015 (0.127) [-0.21%]	---	-0.180 (0.118) [-3.75%]
Race: Black	-0.416*** (0.081) [-4.92%]	-0.416*** (0.081) [-4.92%]	0.007 (0.066) [0.16%]	0.008 (0.066) [0.18%]
Race: Hispanic	-0.242** (0.110) [-3.00%]	-0.242** (0.110) [-3.00%]	0.315*** (0.087) [7.97%]	0.314*** (0.087) [7.94%]
Race: Other	-0.065 (0.158) [-0.89%]	-0.065 (0.158) [-0.90%]	0.220* (0.133) [5.42%]	0.221* (0.133) [5.45%]
Head of Family: Male	0.062 (0.165) [0.92%]	0.063 (0.165) [0.93%]	0.193 (0.125) [4.55%]	0.198 (0.125) [4.67%]
Head of Family: Female	0.210 (0.159) [3.19%]	0.210 (0.159) [3.20%]	-0.029 (0.120) [-0.65%]	-0.025 (0.120) [-0.56%]
Education: High school Grad	0.070 (0.056) [1.01%]	0.070 (0.056) [1.01%]	-0.060 (0.049) [-1.32%]	-0.061 (0.049) [-1.33%]
Education: Some College	0.156** (0.071) [2.42%]	0.156** (0.071) [2.42%]	-0.256*** (0.065) [-5.14%]	-0.255*** (0.065) [-5.12%]
MSA: Urban	0.000 (0.060) [0.01%]	0.001 (0.060) [0.01%]	-0.182*** (0.053) [-4.02%]	-0.181*** (0.053) [-4.00%]
Gender: Female	0.090 (0.064) [1.28%]	0.090 (0.064) [1.28%]	0.009 (0.058) [0.21%]	0.009 (0.058) [0.21%]
Married	0.202 (0.154) [2.91%]	0.203 (0.155) [2.92%]	-0.123 (0.117) [-2.72%]	-0.120 (0.117) [-2.65%]
N	7498	7498	7516	7516

Notes: Unhealthy subsample defined as men and women between the ages of 40 and 64 in self-described poor health. Robust standard errors in parentheses, marginal effects in brackets. Regressions also include state and year fixed effects and a constant.

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

**Table 8: Sensitivity Analyses Using Alternate Definitions of Unhealthy Persons**

		<i>Non-Group</i>		<i>Uninsured</i>	
Individuals 50 and Older with Poor, and Fair health Status	Non-Group CR	0.085 (0.090) [9.03%]	0.069 (0.110) [1.14%]	-0.274*** (0.089) [-2.09%]	-0.195* (0.108) [-3.89%]
	Small-Group CR	---	0.021 (0.082) [0.34%]	---	-0.102 (0.079) [-2.15%]
Individuals 55 and Older with Poor, Fair and Good health Status	Non-Group CR	0.097 (0.073) [1.86%]	0.078 (0.088) [1.49%]	-0.303*** (0.079) [-4.79%]	-0.273*** (0.096) [-4.38%]
	Small-Group CR	---	0.025 (0.062) [0.46%]	---	-0.040 (0.069) [-0.73%]
Individuals 60 and Older Not in Excellent health Status	Non-Group CR	0.041 (0.078) [0.88%]	-0.025 (0.095) [-0.52%]	-0.194** (0.097) [-2.71%]	-0.115 (0.117) [-1.67%]
	Small-Group CR	---	0.087 (0.069) [1.91%]	---	-0.106 (0.084) [-1.57%]
Individuals 55 and Older with Poor, Fair and Good health Status Above Poverty	Non-Group CR	0.146* (0.079) [2.85%]	0.136 (0.094) [2.64%]	-0.358*** (0.088) [-4.45%]	-0.349*** (0.106) [-4.36%]
	Small-Group CR	---	0.013 (0.066) [0.24%]	---	-0.012 (0.076) [-0.18%]

Notes: Robust standard errors in parentheses, marginal effects in brackets. Regressions also include age, race, family structure, education, urban residence, indicator for children present, state and year fixed effects and a constant.

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

**Table 9: National Health Interview Survey, State Data Files, Demographic Information for Years 1992 and 1994 for Persons 18-64 Years Old**

<i>Variable\Year</i>	<i>Categories</i>	<i>1992</i>	<i>1994</i>
Health insurance coverage	Non-group	7.15%	7.31%
	Group	64.99	66.27
	Public	10.59	9.77
	Uninsured	19.13	18.51
Gender	Male	47.15	47.31
	Female	52.85	52.69
Age	18-24	15.41	14.47
	25-44	52.62	51.47
	45-64	31.98	34.06
Race	White	82.68	82.10
	Black	12.86	12.92
	Other	4.47	4.99
Marital Status	Married	65.98	65.83
	Married Once	12.88	13.27
	Never Married	21.14	20.90
Education	Less than HS grad	18.53	16.40
	HS graduate	38.24	37.46
	More than HS grad	43.23	46.14
Family Income	Under \$10,000	9.15	8.49
	\$10,000- \$19,999	14.55	13.51
	\$20,000- \$34,999	21.33	21.71
	Over \$35,000	39.54	43.45
	Unknown	15.43	12.84
Poverty Index	Above	81.43	82.96
	Below	11.37	11.18
	Unknown	7.21	5.86
Major Activity	Working	69.90	70.87
	Keeping House	14.95	14.15
	Going to School	7.27	7.21
	Something Else	7.88	7.77
Working Status in Last Two Weeks	Working	72.44	73.87
	Unemployed	4.45	3.64
	Not in Labor force	23.11	22.49
Metropolitan Statistical Area	MSA- Central City	33.03	31.28
	MSA- Not Central City	45.90	46.20
	Non-MSA Nonfirm	19.84	21.29
	Non-MSA Farm	1.23	1.23
Sample Size		70,791	59,534

Note: Data from 1992 and 1994 NHIS State Data Files.

**Table 10: Mean of Health Status and Utilization Variables for Persons with Non-Group and Group Coverage in Community Rated Relative to Non-Community Rated States**

Category, scale, and direction relative to healthy \ Year	<i>Health Insurance</i>	<i>Community rated States</i>		<i>Non-community Rated States</i>	
		1992	1994	1992	1994
Self Reported Health Status: 1-5, Decreasing	Non-group	2.002	2.018	2.015	2.007
	Group	1.934	1.939	2.005	2.001
Total Activity Limitation: 1-4, Increasing	Non-group	3.763	3.681	3.689	3.672
	Group	3.803	3.801	3.776	3.772
Ability To Work: 1-4, Increasing	Non-group	3.772	3.681	3.671	3.659
	Group	3.797	3.798	3.769	3.766
Total Restricted Days in Past Two Weeks: 0-4, Decreasing	Non-group	0.179	0.443	0.272	0.291
	Group	0.218	0.213	0.273	0.267
Bed Days in Past Two Weeks: 0-1, Decreasing	Non-group	0.037	0.079	0.051	0.048
	Group	0.048	0.045	0.053	0.052
Other Days Of Restricted Activity In Past Two Weeks: 0-1, Decreasing	Non-group	0.032	0.069	0.060	0.056
	Group	0.035	0.036	0.050	0.049
Bed Days in Past Twelve Months: 0-365, Decreasing	Non-group	4.039	8.026	5.183	5.819
	Group	4.214	4.233	4.675	4.412
Number of Doctor Visits in Past Two Weeks: 0-2, declining	Non-group	0.121	0.235	0.176	0.188
	Group	0.173	0.182	0.191	0.197
Number of Doctor Visits in Past 12 Months: 0-11, declining	Non-group	2.569	3.047	2.777	2.664
	Group	2.883	2.915	2.945	2.938
Hospital Episodes: 0-4, declining	Non-group	0.086	0.153	0.109	0.104
	Group	0.106	0.089	0.108	0.104
Total Sample	Non-group	464	379	4,596	3,973
	Group	5,055	4,375	40,949	35,080

Note: Data from National Health Interview Survey State Data Files, 1992, 1994.

**Table 11: Regression Results for Health Status and Utilization Measures from NHIS under Different Model Specifications**

	<i>Difference</i>	<i>DD</i>	<i>DDD</i>
Self Reported Health Status	0.037 (0.049)	0.033 (0.064)	0.064 (0.080)
Total Activity Limitation	-0.063 (0.051)	-0.060 (0.042)	-0.008 (0.016)
Ability To Work	-0.074* (0.033)	-0.071** (0.027)	0.004 (0.015)
Total Restrictive Days in Past Two Weeks	0.273*** (0.024)	0.237*** (0.032)	0.202*** (0.035)
Any Bed Days in Past Two Weeks†	0.364*** (0.093)	0.389*** (0.041)	0.284*** (0.077)
Any Other Days of Restrictive Activity In Past Two Weeks†	0.419*** (0.040)	0.396*** (0.084)	0.189*** (0.064)
Bed Days in Past Twelve Months	3.765*** (0.679)	3.187*** (0.858)	2.494* (1.324)
Any Doctor Visits in Past Two Weeks†	0.433*** (0.054)	0.369*** (0.054)	0.131** (0.055)
Number of Doctor Visits in Past 12 Months	0.481*** (0.108)	0.562*** (0.076)	0.195 (0.184)
Any Hospital Episodes†	0.242*** (0.061)	0.274*** (0.060)	0.248*** (0.059)
Sample Size	843	10273	94871

Note: Data from NHIS State Data Files, 1992 and 1994. Difference represents the simple pre/post difference model; DD represents the difference-in-differences model; DDD represents the difference-in-difference-in-differences model. Each cell represents the impact of community rating in the non-group health insurance market for a different regression model. All regressions control for age, gender, race, marital status, income, education, and state fixed effects.

† Probit regression

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



**Table 12: Mean of HMO Penetration for Persons with Non-Group and Group Coverage in Community Rated Relative to Non-Community Rated States**

			<i>Community Rated States</i>		<i>Non-Community Rated States</i>	
			<i>1992</i>	<i>1994</i>	<i>1992</i>	<i>1994</i>
Full Sample Ages 18-64	Non-group	Sample size	436	304	4,128	3,110
		%HMO	18.58%	26.64%	18.19%	18.23%
	Group	Sample size	4,676	4,064	36,759	32,138
		%HMO	30.45%	39.57%	35.39%	39.87%
Older Subsample Ages 45-64	Non-group	Sample size	193	133	1,833	1,398
		%HMO	19.69%	23.31%	16.48%	15.95%
	Group	Sample size	1,749	1,563	12,752	11,842
		HMO	30.47%	34.80%	32.67%	36.08%
Younger Subsample Ages 18-44	Non-group	Sample size	243	171	2,295	1,712
		%HMO	17.70%	29.24%	19.56%	20.09%
	Group	Sample size	2,927	2,501	24,007	20,296
		%HMO	30.44%	42.54%	36.83%	42.09%

Note: data from NHIS State Data Files, 1992 and 1994.

**Table 13: Probit Regressions of the Probability of having HMO Coverage under Different Model Specifications**

	<i>Difference</i>	<i>DD</i>	<i>DDD</i>
Full Sample, Ages 18-64	0.263*** (0.093) [7.0%]	0.277*** (0.076) [7.1%]	0.234* (0.139) [5.4%]
Sample Size	740	7978	85615
Older Subsample, Ages 45-64	0.180 (0.119) [4.9%]	0.209** (0.082) [4.8%]	0.217 (0.141) [5.2%]
Sample Size	326	3557	31463
Younger Subsample, Ages 18-44	0.342** (0.155) [8.5%]	0.327*** (0.113) [8.8%]	0.251 (0.162) [6.0%]
Sample Size	414	4421	54152

Note: Data from NHIS State Data Files, 1992 and 1994. Difference represents the simple pre/post difference model; DD represents the difference-in-differences model; DDD represents the difference-in-difference-in-differences model. Each cell represents the impact of community rating in the non-group health insurance market for a different regression model. All regressions control for age, gender, race, marital status, income, education, self-reported health status, and state fixed effects.

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