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# Did Community Rating Induce an Adverse Selection Death Spiral? Evidence from New York, Pennsylvania, and Connecticut

By THOMAS BUCHMUELLER AND JOHN DiNARDO\*

In the early 1990's, while comprehensive health care reform was being debated at the federal level in the United States, 45 states introduced their own regulations affecting the small group health insurance market. These state-level reforms were intended to curb insurance carrier practices that might limit the ability of small "high-risk" firms to purchase insurance for their employees. A common feature of these reforms was restrictions on the extent to which insurers can vary premiums according to subscribers' risk status. The most extreme type of restriction is "pure community rating," which mandates that, for a given plan, the same rate must be charged to all individuals or small groups, regardless of their age, sex, or other risk characteristics.

Community rating continues to be a source of considerable controversy. Some industry groups and analysts have argued that, contrary to the intended effect of insurance reform, community rating might actually reduce insurance coverage. [See, for example, W. R. Jones, et al. (1993); John Hartnedy (1994); Mark Litow and Drew Davidoff (1994); Bill Gradison (1995); Merrill Matthews (1997); Charles N. Kahn III (1999).] The mechanism by which this may occur is known as an "adverse selection death

spiral." In an unregulated market, premiums will be "risk rated," that is, younger, healthier consumers are charged lower rates due to their lower expected claims. Since community rating requires insurance companies to charge the same premium to all consumers, the rate charged to younger individuals may rise in response to the higher costs imposed by older persons with the same coverage. If enough younger consumers react to this price increase by dropping coverage, expected claims for the covered group will rise, which will necessitate a further increase in premiums. In the extreme case, this cycle will continue until only those consumers with the highest expected medical expenses retain coverage.

While the notion that community rating leads to adverse selection death spirals appears to have passed into the "conventional wisdom," at least among industry and policy experts, this is not a result that arises naturally from the simplest economic models of health insurance. Moreover, there has been little systematic attempt to document the magnitude of such an effect. The most relevant economics literature is a number of case studies documenting adverse selection *against specific health plans* within employer-sponsored health benefit programs [e.g., Harold S. Luft et al. (1985); James R. Price and James W. Mays (1985); David M. Cutler and Richard J. Zeckhauser (1997); Cutler and Sarah J. Reber (1998)]. A common finding from this literature is that plans that are more attractive to higher-risk individuals are vulnerable to adverse selection death spirals, as lower-risk workers migrate to less comprehensive or more "tightly managed" plans. The implications that these studies have for understanding the effects of mandating community rating in the small group or individual health insurance market, however, is unclear. The strongest argument made against community rating legislation is that such laws lead to adverse selection

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against the entire market. Since in the cases studied, coverage is essentially universal, they offer little insight as to whether imposing pure community rating in a voluntary insurance market will reduce the number of persons purchasing coverage.

In this paper, we take a closer look at the effect of community rating by focusing on three states: New York, Pennsylvania, and Connecticut. These states are geographically proximate, demographically similar, and experienced similar business-cycle conditions over the period we study.<sup>1</sup> The three states also had similar insurance regimes until the early 1990's before diverging sharply. New York enacted comprehensive small group and individual market reforms that included pure community rating in both markets. Indeed, we focus on New York because, of all the states, it enacted the most "extreme" reforms; failure to find an effect of health insurance reform in New York would suggest that reforms in other states were similarly unimportant. The other two states provide arguably good controls. Pennsylvania enacted no reform, and Connecticut enacted moderate reforms that placed only limited restrictions on how insurers could set premiums. Despite some differences, the experiences of these states provide a convenient "natural experiment" for evaluating the effects of community rating.

Our analysis, using data from the 1987–1996 Current Population Survey, finds no evidence to support the argument that New York's reforms reduced insurance coverage by driving younger, healthier consumers from the market. While insurance coverage rates in the New York small group market did fall, and the age distribution of the covered population did shift towards older persons in a manner consistent with a marketwide death spiral, we find almost identical changes in Pennsylvania and Connecticut. Although we find no effect on insurance coverage, we do find some evidence that New York's reforms led to an increase in the market share of HMO's in the small group and individual markets as healthier consumers migrated from indemnity to less costly managed care plans. This

pattern of results, which contradicts assertions by critics of the New York reforms, is consistent with standard theoretical models of insurance markets.

## I. Health Insurance Reform

The focus of state health insurance reforms of the early 1990's was the small group market. Two reasons are commonly given for this emphasis. First, employees of small firms and their dependents represent a disproportionate share of uninsured Americans. Second, prior to the reforms, the small group market was rife with insurer underwriting and marketing practices making it difficult for small groups deemed to be undesirable risks to obtain coverage. Their proponents argued that the small group reforms would increase private insurance coverage by removing the barriers faced by high-risk groups.

Table 1 summarizes the main provisions of the reforms enacted in Connecticut<sup>2</sup> and New York.<sup>3</sup> With respect to most provisions, the reforms in the two states are quite similar to each other, as well as to model legislation proposed by the National Association of Insurance Commissioners and reforms passed elsewhere.<sup>4</sup> Both states require the guaranteed issue and guaranteed renewal of insurance to small groups regardless of the group's industry or risk status. Insurers are allowed to exclude coverage for preexisting conditions for no more than one year after enrollment. Individuals who switch directly from one insurance plan to another, and were with the first for at least six months, are exempted from preexisting conditions exclusions altogether. Because of preemption by the federal ERISA legislation, none of the state-level

<sup>2</sup> Connecticut Public Act 90-134.

<sup>3</sup> The Community Rating and Open Enrollment Law (C. 501).

<sup>4</sup> Mark A. Hall (1994) and Linda J. Blumberg and Len M. Nichols (1996) provide good general discussions of the small group reform movement. For detailed information on the provisions of each state's reforms, see General Accounting Office (1995) or Anne R. Markus et al. (1995). Recent federal legislation, the 1996 Health Insurance Portability and Accountability Act (HIPAA), incorporated many features of small group legislation that had been previously enacted by the states. Our analysis is based entirely on data prior to 1997, when small group regulations in all states were required to conform to HIPAA.

<sup>1</sup> For instance, the simple Pearson correlation for New York's quarterly unemployment rate with that for Connecticut is 0.93 in the sample period we consider. The corresponding correlation for Pennsylvania is 0.88.

TABLE 1—A SUMMARY OF CONNECTICUT AND NEW YORK'S SMALL GROUP AND INDIVIDUAL HEALTH INSURANCE REFORMS

Reform Component	Connecticut	New York
Date reforms became effective	June 1991 (extended October 1993)	April 1993
Definition of small group	1 to 25 (6/91–10/93) 1 to 50 (10/93–)	3 to 50
Reforms apply to individual market?	No	Yes
Guaranteed issue	Yes	Yes
Guaranteed renewal	Yes	Yes
Limits on exclusion of preexisting conditions	6/12	6/12
Rating restrictions	Adjusted community rating	Pure community rating

*Notes:* 6/12 means that conditions present 6 months prior to enrollment can be excluded for a maximum of 12 months. The Connecticut reform allows standard premiums to vary by age, gender, geographic region, industry, group size, and coverage tier (i.e., single, family, etc.). Initially, insurers were allowed to make further adjustments to account for risk differences not captured by these variables. These adjustments were phased out by July 1995. In New York, premiums can vary by market (individual vs. small group), region, and coverage tier.

*Sources:* General Accounting Office (1995); Markus et al. (1995).

reforms apply to self-insured firms. However, self-insurance is quite rare among firms with fewer than 50 employees.<sup>5</sup>

One potentially important difference between the two states is that Connecticut's reforms apply only to the small group market,<sup>6</sup> whereas New York's apply to both the small group and individual markets. This is significant because the individual market is generally seen as being more vulnerable to adverse selection than the small group market.<sup>7</sup> The area where there is the most variation in state-level reforms, and where the difference between the Connecticut and New York reforms is greatest, is the rules governing how premiums for a given plan may vary

across subscribers. The Connecticut legislation allows premiums to vary with age, gender, region, industry, group size, and coverage tier (e.g., single, family).<sup>8</sup>

New York was the only state to impose pure community rating. Since the reforms enacted by many other states were quite minimal in terms of the restrictions placed on insurer behavior, it is hard to make the argument that they should have had much effect at all. This is not the case in New York. Indeed, if there is an "unintended consequences" story to be told about insurance reform, New York is the most likely place to find evidence of an effect. Moreover, New York's community rating law has an important empirical advantage. The death spiral hypothesis is predicated on the assumption that health insurance regulations will have very different effects on high- versus low-risk individuals. A strong test of the death spiral hypothesis requires a correlate of health risk that insurers were allowed to use in underwriting *prior* to the enactment of reform legislation, but not *after*. In the case of pure community rating, age is a risk proxy that meets this requirement. This is in contrast to the small group reforms enacted elsewhere in the country, which typically allow insurers the ability to charge different age-

<sup>5</sup> The 1993 National Employer Health Insurance Survey provides state-level estimates of self-insurance by firm size. According to that survey, 5.7 percent of firms with fewer than 100 employees self-insure. The percentage of firms in this size category that self-insure is even lower in New York, Connecticut, and Pennsylvania: 4.6, 4.1, and 3.0, respectively.

<sup>6</sup> The Connecticut legislation initially applied to groups of 1 to 25; in 1993 the upper limit was extended to 50. To be considered a group of one, a person must be self-employed and work at least 30 hours per week year-round.

<sup>7</sup> Under New York's law, indemnity insurers can treat the two markets as separate, and therefore can choose to offer coverage to small groups, but not individuals (or vice versa). HMOs, however, are subject to a "one-market rule," whereby any HMO offering group coverage in the state must also sell a standardized product in the individual market (Hall, 1998).

<sup>8</sup> Initially, the Connecticut law allowed further adjustments to account for differences in risk not captured by these variables, though these additional adjustments were phased out by July 1995.

groups different premiums. Available data sets provide no reliable health risk proxy that can be used to test the effects of such legislation.

While pure community rating is often depicted primarily as a mechanism to transfer wealth from consumers whose expected medical expenses are lower than average to those whose expected expenses are higher than average, such redistribution did not appear to be the objective of those designing New York's policy. Rather, according to policy makers, the goal was to "level the playing field" for the state's nonprofit Blue Cross and Blue Shield plans (Salvatore R. Curiale, 1994). Prior to the reforms, Blue Cross and Blue Shield "voluntarily" sold community rated insurance on a guaranteed issue basis. Given that their competitors were not bound by such rules, the Blues (as they are commonly known) argued that they were at a significant disadvantage and had been suffering from adverse selection for years.

## II. The Economics of Rate Regulation in a Voluntary Insurance Market

As we explain in more detail in our working paper (Buchmueller and DiNardo, 1999), despite the prevailing belief that an insurance coverage reducing death spiral is a likely consequence of community rating, it is not a prediction that comes naturally out of the simplest models of insurance provision. Consider the two-state Michael Rothschild and Joseph E. Stiglitz (1976) (R-S) framework. When insurers can charge risk-based premiums, in equilibrium older (less healthy) persons pay higher premiums and both young and old choose to fully insure.

The theory predicts two possible responses to the imposition of community rating. In the simplest case, the market response would be a separating equilibrium in which lower-risk consumers purchase a lower *quantity* of coverage—i.e., less than complete insurance. While these low-risk consumers are made worse off, the actual number of persons with insurance is unchanged—there is no death spiral *against the entire market*. The death spiral scenario arises only if the lower quantity of coverage necessary for a separating equilibrium is unavailable. This might be the case, for example, if regulations such as mandated benefits effectively impose a

minimum quantity constraint. Similarly, young consumers may opt to be uninsured if they view low-cost catastrophic coverage as inferior to the "free coverage" that arises from the requirement that hospitals provide certain types of emergency care even in the absence of payment.

Our analysis therefore suggests one of two potential outcomes:

1. No death spiral. Insurance coverage does not fall after the imposition of community rating, and the age composition of covered individuals does not change, but the average quantity of insurance purchased declines.
2. A marketwide adverse selection death spiral. Insurance coverage falls after the imposition of community rating, and there is an increase in the age of those individuals who have insurance.

Note that the first scenario is not inconsistent with the case where certain insurance carriers report the symptoms of an adverse selection death spiral if firms specialize in the type of insurance provided. Insurers previously offering more comprehensive insurance coverage will observe young persons dropping coverage and the average cost of insured individuals rising. The experience of particular carriers, however, provides no information on how community rating affects the total number of persons purchasing insurance in the market. What must be the case for the first scenario to obtain, however, is that the individuals do not abandon coverage altogether but purchase (cheaper) less complete coverage.

## III. The Effect of New York's Reforms on Insurance Coverage

It is clear that after New York's reform went into effect in April 1993, there were significant changes in the market for health insurance. At first pass, many of these changes appear to be consistent with the existence of an "adverse selection death spiral." For instance, New York Department of Insurance data indicate that 40 percent of individual policyholders saw their premiums increase by 20 percent or more, while 18 percent saw their premiums fall by at least 20 percent. As might be expected, younger insured individuals faced the greatest increases, and

older insured experienced the greatest decline (Barents Group, 1996; Mark A. Hall, 1998). It was widely reported in the media how one indemnity insurer, Mutual of Omaha, raised rates for single males under age 30 by 170 percent. There appears to have been slightly less change in the small group market, though there too, rates appeared to increase for younger groups relative to older groups (Hall, 1998). Department of Insurance data indicate that enrollment in New York's individual and small group markets combined fell by 2.4 percent between March 31, 1993 (the day before the reforms became effective) and April 1, 1995 (the two-year anniversary of the reform's enactment).

There are reasons to doubt, however, that these changes were *caused* by the New York reforms. While coverage appears to have fallen after the reforms, it is also the case that New York's reforms were enacted in the midst of a long secular decline in insurance coverage throughout the United States (Richard Kronick, 1991; Gregory Acs, 1995; Stephen H. Long and Jack Rodgers, 1995; Craig A. Olson, 1995; Paul Fronstin, 1997). Indeed, data from the New York Department of Insurance show that combined individual and small group enrollment had fallen by 8.6 percent in the six months *prior* to the enactment of community rating.

Our approach is to estimate the reform's impact by comparing trends in insurance coverage in New York with trends in our "control" states of Pennsylvania and Connecticut. As is clear from our description of the legislation, we expect the contrast in outcomes to be starkest between New York (pure community rating imposed on both the small group and individual markets) and Pennsylvania (no reform in either market). Connecticut, which implemented some reforms in the small group market but did not implement pure community rating, and introduced no new regulations in the individual market, is our intermediate case—we expect its outcomes to lie somewhere between New York and Pennsylvania.

As we detail below, the focus of our investigation is the effect of the reforms on

1. The level of health insurance coverage.
2. The age ("health") distribution of those receiving coverage.
3. The quantity/quality of insurance coverage.

In each case, we first compare changes among small firms in New York to small firms in our two control states. We then look at changes among large firms—which were *not* directly affected by the reforms—in all three states. This provides us both with a possible additional source of identifying information, and a control for possible within-state trends.

#### A. Descriptive Statistics

We use data from the March Current Population Surveys for the years 1988 to 1997. Since the insurance questions in the March CPS refer to coverage during the prior year, our data span the period from 1987 to 1996.<sup>9</sup>

Table 2A presents descriptive statistics on demographics, and employment characteristics for adults (18 to 64 years old) in the three states from the initial year of our data. With the exception of the percentage of minorities and urban residents, both of which are higher in New York than in the other two states, the three states are quite similar in terms of demographics. Because the New York reforms applied only to the small group and individual health insurance markets, we focus on employees of small firms and the self-employed as a "treatment group," using the employees of large firms as a within-state control group. The figures in Table 2A show that in 1988, 44 percent of working adults in New York were either self-employed or employed by a firm with fewer than 100 employees. This is slightly lower than the comparable figures for Pennsylvania (48 percent) and Connecticut (51 percent). The industry distribution is quite similar across the three states.

Table 2B compares the three states in terms of health insurance coverage. The figures show that in 1988, 77 percent of adults in New York had private insurance coverage,

<sup>9</sup> One potential limitation of the March CPS data is the possibility that respondents answer the insurance questions as if they pertained to their insurance status at the time of the survey rather than for the previous year as intended. (Katherine Swartz, 1986; Mark C. Berger et al., 1998). Because the New York reforms became effective in April 1993, our designation of pre- and post-reform years is the same whether we assume that respondents answered the questions as intended, or answered with respect to their current situation.

TABLE 2A—DEMOGRAPHIC AND JOB CHARACTERISTICS:  
NEW YORK, PENNSYLVANIA, AND CONNECTICUT, 1988

	New York	Pennsylvania	Connecticut
<i>Demographic Characteristics</i>			
Age	38.3	38.9	38.0
Years of schooling	12.9	12.9	13.4
Married (0,1)	0.56	0.64	0.59
White (0,1)	0.84	0.92	0.93
Hispanic (0,1)	0.15	0.02	0.07
Female (0,1)	0.53	0.53	0.51
Student (0,1)	0.07	0.06	0.06
Residues in Central City (0,1)	0.44	0.18	0.14
Residues in MSA, not Central City (0,1)	0.38	0.44	0.38
<i>Firm Size, Industry</i>			
Self-employed or works for a small firm	0.44	0.48	0.51
Manufacturing	0.44	0.46	0.43
Transportation, utilities, communication	0.05	0.06	0.04
Wholesale/retail trade	0.13	0.15	0.15
Finance, insurance, real estate	0.07	0.05	0.07
Professional services	0.19	0.18	0.2
Other services	0.09	0.08	0.07
Public administration	0.04	0.03	0.03
Number of observations	4,299	3,779	845

*Notes:* Self-employment status, firm size, and industry are defined for workers only. Small firms are defined as having fewer than 100 employees at all locations.

*Source:* Sample means are tabulated using the 1989 March CPS. Sample consists of civilian adults between the ages of 18 and 64.

TABLE 2B—INSURANCE COVERAGE:  
NEW YORK, PENNSYLVANIA, AND CONNECTICUT, 1988

	New York	Pennsylvania	Connecticut
Private health insurance, any source (0,1)	0.77	0.84	0.87
Employer-sponsored insurance (0,1)	0.69	0.76	0.77
Private insurance in own name (0,1)	0.54	0.56	0.62
Uninsured (0,1)	0.13	0.10	0.10
Number of observations	4,299	3,779	845
<i>Private insurance by source of coverage</i>			
Nongroup/individual	10.4 percent	9.5 percent	11.5 percent
Small employer-sponsored group	40.3 percent	42.9 percent	36.8 percent
Large employer-sponsored group	49.4 percent	47.6 percent	51.7 percent

*Source:* Authors' tabulations using the 1989 March CPS. Sample consists of civilian adults between the ages of 18 and 64.

compared to 84 percent in Pennsylvania and 87 percent in Connecticut. Much of New York's lower coverage rate is due to a lower percentage of adults who are covered by private insurance as a dependent on someone else's policy. When we look at the percentage of those covered by insurance in their own name, the Pennsylvania-New York differential is only 2 percentage points, and the

Connecticut-New York differential is 8 percentage points. Among adults with private coverage, the distribution by source of coverage is very similar across the three states.

#### IV. Methods and Results

Our empirical analysis is divided in two sections, corresponding to the types of predictions

made by the theoretical model discussed in Section II. First, we examine the effect of New York's health insurance reforms on the rate of health insurance coverage. Second, we investigate whether the reforms affected the quantity/quality of insurance coverage by looking at the percentage of individuals covered by HMO's.

#### A. *Measuring the Effect of the Reforms on Insurance Coverage*

In this subsection, we generate a variety of different estimates of the effect of the reforms. The simplest estimator is a "difference-in-differences" (DD) estimator.

Let  $\bar{I}$  denote the appropriate regression-adjusted<sup>10</sup> mean of insurance and let  $\Delta$  be the operator that computes the difference before and after 1993. Our estimator is

$$DD \equiv \Delta \bar{I}_{NY} - \Delta \bar{I}_{Control}$$

where the control group is either Pennsylvania, Connecticut, or the pooled sample of controls.

A limitation of this specification is that it assumes that the impact of the reform does not vary by employer size. As the reforms were designed to apply only to individuals working in firms with 50 or fewer full-time workers, we can make use of larger firms to compute a "difference-in-difference-in-differences" (DDD) estimate analogous to our previous estimator. When we use Pennsylvania as a control group our estimator is simply:

$$DDD \equiv \{\Delta \bar{I}_{NY,L} - \Delta \bar{I}_{NY,B}\} \\ - \{\Delta \bar{I}_{PA,L} - \Delta \bar{I}_{PA,B}\}$$

where the subscripts refer to whether the firm is "Little" (L) or "Big" (B).

In Table 3 we first report the DD estimates of the effect. The results in the first rows of the

table are from regressions using the full ten years of data. We also estimated models using a more focused subsample consisting of data from 1991 to 1996; those results are reported in the second row.

When we use the full 1987–1996 sample and consider Pennsylvania as the control group, the results suggest that New York's reforms led to a 1.1-percentage-point fall in coverage (first row, first column). The evidence for an effect vanishes, however, if either we use Connecticut as a control (column 2) or we restrict our attention to the years 1991–1996 (second row). Restricting the pre-reform period in this way seems especially appropriate as an inspection of the data indicates the Pennsylvania–New York coverage gap widened between 1987 and 1991, well before the reforms. With this shorter time period, we avoid attributing this earlier trend to the reforms. The regression results also suggest that we can pool the data from Connecticut and Pennsylvania. The advantage of doing so is that it enables us to get more precise estimates. When we pool Connecticut and Pennsylvania to form a single control, the effect is a precisely estimated zero for either the longer time period or (our preferred) shorter time horizon.

One limitation of this specification is that these estimates average the change in coverage for employees of small firms with employees of large firms who should not have been affected by the reforms. We therefore consider the augmented specification that allows for differences between workers in large and small firms.<sup>11</sup> The results of this exercise are reported in Table 4. We also report results for two dependent variables: a dummy for whether the worker has private insurance from any source (as in the

<sup>10</sup> As a practical matter these means are actually a set coefficients from a OLS regression of health insurance coverage on a vector of demographic variables and the appropriate reform/no reform or state indicators.

<sup>11</sup> The firm size categories in the CPS (less than 25, 25 to 100, 100 to 499, 500 to 999, and 1,000 or greater) do not match up perfectly with the definition of a small group under New York's reforms (3 to 50 full-time employees). We define small firms as those with fewer than 100 employees. This split ensures that workers in firms with 25 to 50 employees, who should have been affected by the reforms, will be in the "treatment group." Since the reforms apply to full-time workers and the CPS question refers to all workers, some firms with 50 to 100 employees were also subject to the reforms. Dropping workers in firms with 25 to 50 employees and comparing workers in very small firms (less than 25) to those in larger firms (100 or more) does not materially affect any of our results.



TABLE 3—DIFFERENCE-IN-DIFFERENCES ESTIMATES OF THE EFFECT OF NEW YORK'S REFORMS ON INSURANCE COVERAGE USING PENNSYLVANIA AND CONNECTICUT AS CONTROL GROUPS

	Change in NY less Change in		
	PA	CT	PA and CT
A. 1987 to 1996 (N = 104,333)	-0.011 (0.005) [0.027]	-0.00004 (0.009) [0.999]	-0.009 (0.005) [0.056]
B. 1991 to 1996 (N = 60,502)	-0.004 (0.006) [0.517]	0.016 (0.012) [0.170]	-0.0006 (0.006) [0.926]

*Notes:* The samples consist of all adults between the ages of 18 and 64. The dependent variable is an indicator variable for private insurance from any source. Standard errors are in parentheses, and the probability that the difference equals zero is in brackets. All specifications include controls for age, age squared, education, education squared, and indicator variables for sex, white/nonwhite, Hispanic ethnicity, marital status, currently in school, full-time/part-time employment status (five classes), location size (four classes), industry (seven classes), and class of worker (private, state government, local government, self-employed).

previous table), and one for whether she has private coverage in her own name.<sup>12</sup>

Only when we use private insurance from any source as our dependent variable, treat Pennsylvania as the control, and use the entire ten years of data, does the DDD estimate approach standard levels of statistical significance. That estimate implies that coverage fell by 1.7 percentage points in the wake of the reforms. However, when we use the same model but compare the trend in New York to that in Connecticut, the result is a precisely estimated zero effect. When we consider private insurance in one's own name, which is a more appropriate dependent variable for contrasting employees of big and little firms, the full-sample regressions yield estimated reform effects that are zero whichever control group is used. When we drop the data from years prior to 1991 (our preferred specifications) the results for both dependent variables and both control states imply the New York reforms had no effect on insurance coverage.

<sup>12</sup> Of the two measures, "private coverage in anyone's name" is arguably most relevant for policy purposes as policy makers are concerned more about the extent of coverage than its source. A focus on coverage in one's own name, however, is consistent with our use of firm size and self-employment status to define treatment and control groups. Therefore this variable is more relevant for testing the death spiral hypothesis.

As in our previous analysis, pooling the data for the two control states yields precisely estimated and substantively small measured effects.

### B. Further Predictions

One piece of evidence cited by the most "dire" criticisms of community rating is that deterioration in the risk pool in New York—specifically that pool of insured individuals aged after the reforms in 1993. Indeed, it is clear from the top half of Figure 1—a simple estimate of the age distribution of those with small group insurance—that this is, in fact, correct for New York.

Contrary evidence for such criticisms, however, is that the risk pool of the small group market deteriorated in a similar way in Pennsylvania (see the bottom half of Figure 1). That is, in both states (and Connecticut as well) the pool of insured individuals became older. Indeed, the pool of individuals insured through large firms—individuals specifically exempted from the reforms—also aged in a similar fashion.

Recall from Section I that the rules on how insurers can set premiums were not the only way the New York reforms were more comprehensive than those in our control states. A second difference was the fact that the New York reforms applied to *both* the individual and small

TABLE 4—ESTIMATES OF THE EFFECT OF NEW YORK'S REFORMS ON INSURANCE COVERAGE USING PENNSYLVANIA AND CONNECTICUT AS CONTROL GROUPS

	Change in NY less Change in		
	PA	CT	PA and CT
<i>A. 1987 to 1996 (N = 74,386)</i>			
<i>Private insurance, any source</i>			
1. Self-employed/employees of small firms	-0.035 (0.008) [0.000]	-0.027 (0.014) [0.044]	-0.034 (0.007) [0.000]
2. Employees of large firms	-0.018 (0.007) [0.010]	-0.018 (0.012) [0.133]	-0.018 (0.006) [0.007]
3. Difference-in-difference-in-differences (row 2 less row 1)	-0.017 (0.011) [0.105]	-0.009 (0.018) [0.609]	-0.016 (0.009) [0.113]
<i>Private insurance in own name</i>			
1. Self-employed/employees of small firms	-0.021 (0.010) [0.029]	-0.014 (0.017) [0.411]	-0.020 (0.009) [0.030]
2. Employees of large firms	-0.007 (0.009) [0.397]	-0.007 (0.015) [0.642]	-0.007 (0.008) [0.385]
3. Difference-in-difference-in-differences (row 2 less row 1)	-0.014 (0.013) [0.287]	-0.007 (0.023) [0.758]	-0.013 (0.012) [0.297]
<i>B. 1991 to 1996 (N = 43,660)</i>			
<i>Private insurance, any source</i>			
1. Self-employed/employees of small firms	-0.012 (0.011) [0.289]	0.005 (0.019) [0.801]	0.0001 (0.014) [0.995]
2. Employees of large firms	-0.012 (0.009) [0.207]	0.004 (0.016) [0.816]	-0.009 (0.009) [0.315]
3. Difference-in-difference-in-differences (row 2 less row 1)	0.0003 (0.014) [0.982]	0.001 (0.025) [0.587]	0.0001 (0.014) [0.995]
<i>Private insurance in own name</i>			
1. Self-employed/employees of small firms	0.006 (0.014) [0.649]	0.013 (0.023) [0.587]	0.007 (0.013) [0.566]
2. Employees of large firms	0.001 (0.011) [0.965]	0.009 (0.019) [0.661]	0.002 (0.011) [0.851]
3. Difference-in-difference-in-differences (row 2 less row 1)	0.006 (0.018) [0.746]	0.004 (0.030) [0.890]	0.005 (0.017) [0.746]

*Notes:* Samples consist of working adults between the ages of 18 and 64. The dependent variable is in italics, standard errors are reported in parentheses, and the probability that relevant difference equals zero is in brackets. All specifications include controls for age, age squared, education, education squared, and indicator variables for sex, white/nonwhite, Hispanic ethnicity, marital status, currently in school, full-time/part-time employment status (five classes), location size (four classes), industry (seven classes), and class of worker (private, state government, local government, self-employed). Small (large) firms are those with fewer (more) than 100 employees.

group markets. In Connecticut, by contrast, the more limited reforms were restricted to the small group market. It could be argued that the adverse selection death spiral did not occur in the small group market because the formation of

employer-sponsored groups had already enabled some pooling of young and old consumers, muting the impact of community rating on the distribution of premiums and therefore limiting the exodus of younger consumers from the

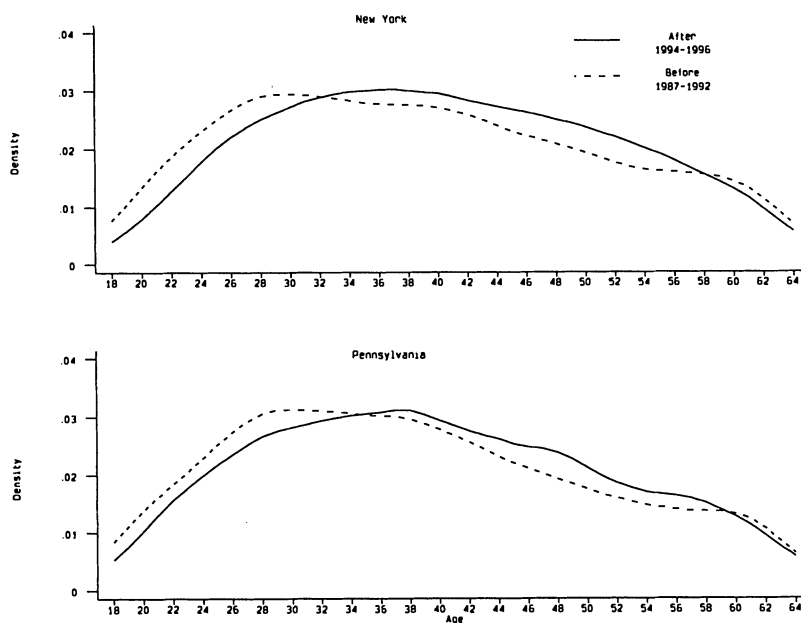


FIGURE 1. THE AGE DISTRIBUTION OF ADULTS WITH SMALL GROUP HEALTH INSURANCE: NEW YORK AND PENNSYLVANIA, BEFORE AND AFTER 1993

market. According to this line of reasoning, a death spiral may still have arisen in the individual market, where in the pre-reform period there was less pooling and premiums for young and old consumers differed dramatically. Nonetheless, the evidence from the individual markets is virtually identical to the evidence in Figure 1. While the age distribution of insured individuals in New York shifted to the right, it did so in virtually an identical fashion for our control states.<sup>13</sup>

The death spiral hypothesis makes the further prediction that the effect of imposing community rating should vary with health risk. In particular, since premiums would be expected to increase the most for younger consumers, and perhaps decrease for older ones, the decline in coverage should be most pronounced among younger consumers. Therefore, an alternative to analyzing the age distribution of the insured population is to

compute separate DDD estimates for “young” and “old” individuals.

In Table 5, we present the results of such analysis, somewhat arbitrarily defining “young” to be workers aged 18 to 40, and workers aged 40 to 64 as “old.”<sup>14</sup> We find no evidence consistent with the death spiral scenario. Using our longer panel (Panel A of the table), the decrease in coverage was virtually zero for young persons, and negative for older persons—just the reverse predicted by the death spiral hypothesis. This is true for whether we use “private insurance, any source” or “private insurance in own name” as our dependent variable.

In Panel B of the table, we display the results for our preferred time period. The results again are quite unfavorable to the death spiral hypothesis. Indeed, when we use “private insurance in own name” as the dependent variable, our estimates are actually positive (albeit small) and slightly larger for the older group.

<sup>13</sup> These comparisons are done more formally in Buchmueller and DiNardo (1999).

<sup>14</sup> We experimented with different cutoffs which produced qualitatively similar results. The cutoff we choose to display approximately splits the samples in half.

TABLE 5—DDD ESTIMATES FOR DIFFERENT TREATMENT GROUPS

	Workers aged 18 to 40	Workers aged 40 to 64
A. 1987 to 1996	(N = 40,048)	(N = 34,338)
<i>Private insurance, any source</i>	-0.004 (0.014) [0.781]	-0.046 (0.013) [0.000]
<i>Private insurance in own name</i>	-0.006 (0.016) [0.704]	-0.019 (0.017) [0.281]
B. 1991 to 1996	(N = 22,854)	(N = 20,806)
<i>Private insurance, any source</i>	-0.009 (0.024) [0.717]	-0.017 (0.022) [0.281]
<i>Private insurance in own name</i>	0.014 (0.283) [0.631]	0.018 (0.030) [0.552]

*Notes:* The dependent variable is in italics. For each subsample, the parameter estimates represent a “difference-in-difference-in-differences” estimator as defined in the text and row 3 of Table 4. This estimate can be interpreted as the effect of the New York reforms on the probability of having private health insurance coverage relative to the probability for the comparable subpopulation in Pennsylvania and Connecticut (combined). Standard errors are reported in parentheses, and the probability that the relevant effect equals zero is in brackets. The regression specification and the definition of the pre- and post-reform periods are identical to the models reported in Table 4.

### C. The Effect of Reform on the Structure of the New York Market

Up to this point, the evidence strongly suggests that there was no marketwide death spiral induced by the health insurance reforms in New York. Although the qualitative evidence suggests to the contrary, one possible explanation for the results is that the reforms were ineffectual. We therefore return to the simple model we described in Section II to look for an additional prediction. Recall that the R-S model suggests that the imposition of community rating should not necessarily lead to a reduction in the number of covered *individuals*. Indeed, a more straightforward prediction of the model is that community rating should lead to a lower *quantity* of health insurance purchased by younger (low-risk) individuals.

While we lack a precise measure of average quantity of coverage purchased by those with health insurance, we do have additional data that bears on this question. Specifically we can look at the change in the type of insurance—HMO or indemnity—purchased before and after the reforms. Although HMOs in some sense provide more complete insurance coverage (i.e., less exposure to large out-of-pocket costs), the

ways that HMOs ration care and limit consumers’ choice of physicians and treatments likely represents a lesser “quantity” of insurance. In particular, HMOs represent a form of insurance that is considerably less attractive to high-risk consumers, an essential prerequisite for the separating equilibrium we described in Section II (Mark V. Pauly, 1985; Roger Feldman and Bryan Dowd, 1994, 2000).<sup>15</sup>

Although not a major issue in the debate that preceded the reforms, informed observers reported that the New York reforms appeared to have spurred an increase in HMO enrollment in the state’s small group and individual market (*Managed Care Week*, 1994). Moreover, other studies, relying mainly on interviews with state regulators, insurance brokers, and industry representatives, point to a similar conclusion (Deborah J. Chollet and Rebecca R. Paul, 1994; Hall, 1998).

Although this evidence suggests that reforms did indeed have some impact, the fact that managed care enrollment was increasing throughout

<sup>15</sup> There is considerable evidence that when HMOs were introduced to the Medicare program, they tended to attract healthier than average beneficiaries. See Randall S. Brown et al. (1993).

TABLE 6—THE PERCENTAGE OF INSURANCE-PROVIDING FIRMS OFFERING HMO COVERAGE: NEW YORK, CONNECTICUT, AND PENNSYLVANIA, BEFORE AND AFTER 1993

HMO Offer Rate	NY	PA	CT	PA and CT
<b>Pre-1993</b>				
Small firms	0.160 (N = 106)	0.143 (N = 70)	0.194 (N = 36)	0.160 (N = 106)
Large firms	0.655 (N = 325)	0.557 (N = 271)	0.537 (N = 108)	0.551 (N = 379)
<b>Post-1993</b>				
Small firms	0.418 (N = 55)	0.167 (N = 60)	0.222 (N = 18)	0.179 (N = 78)
Large firms	0.726 (N = 175)	0.706 (N = 136)	0.705 (N = 44)	0.706 (N = 180)
<b>Differences over Time</b>				
		Change in NY less		
		PA	CT	PA and CT
1. Small firms	0.234 (0.111) [0.035]		0.230 (0.153) [0.132]	0.239 (0.102) [0.020]
2. Large firms		-0.078 (0.065) [0.225]	-0.097 (0.093) [0.294]	-0.084 (0.060) [0.161]
3. Difference-in-difference-in-differences (row 2 less row 1)	0.312 (0.128) [0.015]		0.327 (0.179) [0.067]	0.322 (0.118) [0.007]

Notes: The data are from surveys of employers conducted by the Health Insurance Association of America in 1988, 1989, 1990, and 1991, and KPMG/Peat Marwick in 1993 and 1995. Small (large) firms are defined as establishments with fewer than (at least) 100 employees. The sample size is 1,405. Standard errors are in parentheses except where otherwise noted; figures in brackets represent the probability that the difference equals zero.

the country in the mid-1990's makes it important to assess trends in New York relative to an appropriate counterfactual. To do this we use data from six employer surveys conducted between 1988 and 1995 by the Health Insurance Association of America and KPMG/Peat Marwick.<sup>16</sup> Specifically we focus on the percentage of insurance-providing firms choosing HMOs rather than indemnity coverage.<sup>17</sup> As before, we compute a simple difference-in-differences es-

timate (the change in New York less the change in the appropriate control group), and display the results in the first row of Table 6. Again we use the trends in the insurance coverage among large firms as an additional within-state control.

The results are quite striking. Prior to 1993 the three states had very similar rates of HMO penetration, particularly in the small group market where the differences were not significantly different at conventional levels. Consistent with the R-S framework, however, after 1993 the percentage of small firms in New York offering HMOs more than doubled from its pre-reform levels, increasing by 25 percentage points.<sup>18</sup>

<sup>16</sup> The survey years are 1988, 1989, 1990, 1991 from HIAA and 1993 and 1995 from KPMG/Peat Marwick. The surveys from the different years use the same sampling scheme and very similar survey instruments. For additional information on this data, see Lara D. Shore-Sheppard et al. (2000).

<sup>17</sup> If the data were available—and they are not—we would like to analyze the number of workers with HMO coverage as opposed to the number of firms offering HMO plans. As a practical matter, however, since the vast majority of firms offer just one plan, the two measures are highly correlated.

<sup>18</sup> Although data are noisy, this increase does appear to be related to timing of reforms and not merely the continuation of a preexisting trend. In the pre-reform period, there is no significant trend. The percent of small firms offering HMOs increased between 1991 and 1993 (from 22 percent to 32 percent). It increases even further to 52 percent in 1995.

The corresponding growth in Pennsylvania and Connecticut, meanwhile, was quite small (and insignificantly different from zero.) Consequently, our difference-in-differences estimates (using either control state individually or the two pooled) suggest the reforms significantly altered the structure of the New York small group insurance market. The three difference-in-differences estimates are identical—about 23 percent.

Moreover, the relative change in the HMO penetration rate for large firms indicates that this result is not an artifact of differences in statewide trends. If anything, the point estimates in the table suggest that HMO coverage was increasing more rapidly among large firms in Pennsylvania and Connecticut than in New York (although these differences are not significantly different from zero.) Consequently, the three DDD estimates in the last row of the table—about 32 percent—are even larger than the corresponding DD estimates.<sup>19</sup>

As noted above, the R-S model also predicts that HMO coverage should have increased most dramatically among younger (healthier) groups. While we can not test this prediction directly with the HIAA/KPMG data, data from the New York Department of Insurance does bear on this issue. When the New York reforms went into effect, the state began collecting information from insurance carriers on demographic risk factors to be used in a risk-adjustment mechanism. Table 7 presents these data aggregated for three segments of the combined small group and individual market—Blue Cross/Blue Shield plans, commercial indemnity carriers, and HMOs—for the years 1993 to 1996.

The demographic factors are based on the expected medical care costs for individuals in different age/sex/family-size cells. We have

TABLE 7—RISK FACTORS IN THE NEW YORK SMALL GROUP AND INDIVIDUAL HEALTH INSURANCE MARKET, 1993 TO 1996

Market Segment	1993	1994	1995	1996
Blue Cross/Shield	1.076	1.076	1.084	1.089
Commercial indemnity	0.923	0.946	0.959	0.972
HMOs	0.926	0.937	0.948	0.963
Total statewide market	1.000	1.000	1.001	1.001

Note: See text for details.

Source: New York State Department of Insurance.

normalized the data so that the statewide figure for the initial year (1993) is set to 1. There are two important things to note about these data. First, in the base year, HMOs and commercial indemnity insurers were attracting significantly better risks than the Blues. This is consistent with our characterization of HMOs as a lesser quantity of insurance that is relatively more attractive to lower-risk consumers, and the fact that prior to the reforms commercial carriers engaged in “cherry-picking.” Second, the figures in the last row indicate that the entire risk pool deteriorated very little in the first three years of the New York reforms, which is consistent with our age density results, and inconsistent with a marketwide death spiral. Third, the fact that the average risk factor increased for each of the three segments is consistent with our theoretical model: Those consumers who switched from indemnity coverage (either through the Blues or a commercial carrier) to an HMO were younger on average than those staying in indemnity plans, but older than the consumers who were in HMOs prior to the reforms.

## V. Concluding Remarks

Using data from the March CPS, we find no evidence for the dire predictions of some that the imposition of pure community rating leads to an “adverse selection death spiral.” Specifically, the percentage of individuals in small firms covered by insurance did not fall in New York (which imposed pure community rating in its small group and individual health insurance markets) relative to Pennsylvania (which enacted no new insurance regulations) or Connecticut (which enacted very moderate insurance reforms). Consistent with the predictions of the

<sup>19</sup> We do not have precisely comparable data for the individual market in these states although other evidence strongly suggests the same pattern was evident. Data from the New York State Department of Insurance show that the HMO share of the individual market increased from 8 percent in March 1993 to 25 percent in April 1995 (Hall, 1998). Chollet and Adele M. Kirk (1998) report market-share data (measured as a percent of premium revenue) that indicate in 1995 HMOs had an 8-percent share in Pennsylvania and a 30-percent share in New York. (Their analysis is based on a sample of states that does not include Connecticut.)

simple R-S framework, however, we find that the reforms had a significant impact on the structure of the New York insurance market. Specifically, New York experienced a dramatic shift away from indemnity insurance toward HMOs. While this shift took place during a period of nationwide increases in the managed care enrollment, the increase in HMO penetration in New York's small group and individual markets was significantly greater than in either Pennsylvania or Connecticut.<sup>20</sup>

The implications of these results for policy are not immediate. Contrary to the "worst case" scenarios depicted by the insurance industry and other critics of reform, there is no evidence that the reforms led to a significant increase in the number of uninsured individuals. At the same time, our results suggest that the primary goal of reform proponents—to increase the percentage of persons with health insurance—was not met either.

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<sup>20</sup> We should note that while our finding that there was no "death spiral" runs counter to predictions that were made prior to the enactment of New York's reforms and arguments made by reform critics thereafter, our results are quite consistent with detailed qualitative studies of the New York experience (Chollet and Paul, 1994; Hall, 1998).

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