



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



# **RISK POOLING AND REGULATION: POLICY AND REALITY IN TODAY'S INDIVIDUAL HEALTH INSURANCE MARKET**

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# **RISK POOLING AND REGULATION: Policy and Reality in Today's Individual Health Insurance Market**

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## **ABSTRACT**

Analysis of new data on the relationship between health risk and premiums and coverage in the individual insurance market shows that actual premiums paid for individual insurance are much less than proportional to risk, and risk levels have a small effect on obtaining coverage. States limiting risk rating in individual insurance display lower premiums for high risks than other states, but such rate regulation leads to an increase in the total number of uninsured persons. The effect on risk pooling is small because of the large amount of risk pooling in unregulated individual insurance.

# INTRODUCTION

Americans should all have health insurance. But Americans differ in risk, and that difference potentially affects both the value they attach to health insurance and the premiums they are charged for it. How insurance should deal with risk variation is a key policy issue.

The variation in how private insurance treats customers at different levels of risk are often thought to be most pronounced in the smallest segment of the health insurance market, the market for individual (sometimes called “non-group”) insurance coverage. The purchasers in the individual market are more heterogeneous than those for other kinds of health insurance--in their characteristics and in their risk levels. Not surprisingly, they then face explicit variation in premiums that depends on some of these characteristics--generally the ones thought to be predictive of expected benefits--of which health risk is probably the most important.

The overall variation in premiums paid, prior research tells us, depends on the amount and type of insurance chosen, the effort or luck which attends the buyer’s search process, and buyer characteristics thought by insurers to be correlated with risk.<sup>1</sup> However, premiums are also affected by policy provisions guaranteeing renewability of coverage at rating-class average premiums, independent of any changes in the insured’s risk. Individual insurance contracts generally do not permit “renewal underwriting.” How much linking of premiums to risk actually exists cannot be settled by conjecture or anecdote, but requires empirical evidence.

The individual market is extraordinarily untidy, variegated, and malleable. It is this way precisely because it is the wide-open “residual market” that has the task of picking up those who do not obtain employment group insurance. Some have questioned whether its use should be encouraged for such purposes. Some policymakers and regulators would agree with a frustrated buyer quoted in a recent *Wall Street Journal* story: “If you have a job with health coverage, then you get health coverage. If you don’t, you’re simply out of luck.”<sup>2</sup> There would even be more agreement with this article’s conclusion--that the individual market “has a big problem: sick people often cannot get insurance or if they can, it’s prohibitively expensive.” “Often” is not a useful number, but knowing what proportion of high risks actually pay high premiums or fail to have coverage in this market, and how that compares with the proportion of people at other risk levels, and in other insurance markets, would be useful. How serious are the problems, are they worse than in group markets, and are there some arrangements in the individual market that work better than others?

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<sup>1</sup> The search process for insurance is examined in M. Pauly, B. Herring and D. Song, “Information Technology and Consumer Search for Health Insurance,” *International Journal of the Economics of Business* 13(1), 2006: 45-63.

<sup>2</sup> S. Lueck, “Seeking Insurance, Individuals Face Many Obstacles,” *Wall Street Journal*, May 31, 2005.

The individual market covers a small fraction of those who are privately insured and it only attracts about a quarter of those without group coverage.<sup>3</sup> Those left uninsured are the segment of the American population that falls through the cracks even in this market of last resort. The individual market has assumed a more prominent place than its current 6 percent share of the privately insured population would suggest. It is sometime proposed as a target for tax credits. Both greater use of and reform in the individual market are at the center of the recently passed Massachusetts plan to cover the uninsured in that state. Just as there is substantial variation among the people who could use the individual market and their actual use of it in reality, so there is substantial variation in perceptions of policy analysts and policymakers about whether this market should be encouraged and improved or disparaged and discouraged. In this paper we provide evidence based on analysis of recent data on how this market currently functions. The data will describe insurance pricing and purchasing by risk level.

## **RISK VARIATION AND THE PURCHASE OF INSURANCE: WHAT MIGHT WE EXPECT?**

Before turning to the data, we discuss what one might expect to see in such a market. We begin with the benchmark economic model of rational insurance purchasing. Consider a set of persons who are not poor and suppose that individual insurance were to be offered to them in a large variety of forms and premiums. The conventional wisdom, based on anecdotes and elementary economic thinking, is that: (1) profit-seeking insurers will charge high risks premiums proportional to that high risk; and (2) many such persons will respond to this high price by being less likely to buy.

More sophisticated economic theory does not offer unequivocal support for either proposition. While the higher risks will pay higher premiums, they will expect on average to collect more benefits. For middle income people there need be no substantial negative impact of risk rating on the overall proportion of a population obtaining coverage; as long as the administrative cost is not too large, high risks need not be “priced out” of coverage that pays for expenses they would incur in any case.

But what about those lower income people who are unusually high risk? Isn't it likely that even moderately well off higher risk households would be unable to “afford” higher premiums? There is no precise or useful definition of “affordability” currently available.<sup>4</sup> The availability of charity care to the uninsured may provide a viable, though certainly less attractive, alternative.<sup>5</sup> It is therefore an empirical matter whether high

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<sup>3</sup> M. Beeuwkes-Buntin, M.S. Marquis and J.M. Yegian, “The Role of the Individual Health Insurance Market and Prospects for Change,” *Health Affairs* 23(6), 2004: 79-90.

<sup>4</sup> M.K. Bundorf and M. Pauly, “Is Health Insurance Affordable for the Uninsured?” *Journal of Health Economics* 25(4), 2006: 650-673.

<sup>5</sup> B. Herring, “The Effect of the Availability of Charity Care to the Uninsured on the Demand for Private Health Insurance,” *Journal of Health Economics* 24(2), 2005: 225-252.

premiums for high risks discourage insurance coverage and whether any such effects increase as income falls.

## **WHAT THE DATA ON PREMIUMS SHOW**

Since we cannot settle things with a priori reasoning, we need to see how individual insurance markets really work. We take realism to require that we study actual insurance transactions. Typically people on both sides of the political divide have tried to study this market by looking at hypotheticals: hypothetical prices for hypothetical insurance purchases by hypothetical customers. For example, they look at the premiums that insurers “quote,” without regard to whether or not the insurer will actually sell coverage at that premium upon receipt of an underwriting report or whether buyers will pay that premium.<sup>6</sup> Or they look at what buyers with various health histories were told when they first called an insurer, without regard to the benefits of shopping around or negotiating (sometimes by the consumer but more frequently by an insurance broker).<sup>7</sup> And they almost always look at brand new customers unknown to the insurer, and the potential premium at first issue; they do not look specifically at customers who have renewed with the same insurer. If we look at actual transactions, we can avoid these kinds of noisy and hypothetical measures. We therefore examined data from several large samples of people who might be buyers of individual insurance, and we look at two aspects of their actual behavior--whether or not they obtain coverage and, if they do, what premium they pay.

## **HOW THINGS USED TO BE AND HOW THEY MIGHT HAVE CHANGED**

The work to be reported here is to be contrasted to our prior work studying individual insurance markets in the late 1980s.<sup>8</sup> That work found that premiums actually paid were very far away from the model of proportional risk rating. We found that, although premiums increased with expected expenses, they did so much less than proportionately. Moreover, the only risk variables that predicted higher premiums consistently were age, gender, and location; given these variables, those who had higher expected expenses (associated usually with chronic conditions) could not be shown to pay more than those who did not.

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<sup>6</sup> V. Patel, “Analysis of National Sales Data of Individual and Family Health Insurance,” June 2001, <http://www.ehealthinsurance.com/ehealthinsurance/eHealth2.pdf> (accessed August 9, 2006).

<sup>7</sup> K. Pollitz, R. Sorian and K. Thomas, *How Accessible is Individual Health Insurance for Consumers in Less-Than-Perfect Health?*, Kaiser Family Foundation Report, June 2001. N. Turnbull and N. Kane, *Insuring the Healthy or Insuring the Sick? The Dilemma of Regulating the Individual Health Insurance Market*, Commonwealth Fund Report #771, February 2005.

<sup>8</sup> M. Pauly and B. Herring, *Pooling Health Insurance Risks*, AEI Press, 1999.

We also looked at whether risk affected having coverage. We found that the likelihood of having coverage was no smaller for the higher risks than for the lower risks, controlling for income, age, and gender. Indeed, controlling for income, younger people (despite risks and premiums much below average) were less likely than people in their fifties (who paid much higher premiums) to buy coverage.<sup>9</sup>

There was a great amount of de facto “risk pooling”--in the sense that people with different expected loss experiences pay rather similar premiums in the individual insurance market. The amount of averaging appears at first glance to be so great as to be hard to square with rational profit maximizing behavior by informed insurers. Either the high risk consumers were hoodwinking insurers, or something else was going on.

We did identify one of the things that affected the relationship of risk to premiums--guaranteed renewability.<sup>10</sup> Even though not then generally required by regulation, guaranteed renewability was a very common policy provision. If most people with insurance with this provision had initially bought individual coverage when they were relatively low risks, but then stuck with it as risk levels increased due to chronic conditions, their later-period premiums would not vary with person-specific risk.

Since average risk (and premiums) rises with age, making such a promise implies that premiums for younger people will be “front loaded,” containing an extra charge to cover the future loss of those who become high risks, which insurers then hold as reserves; this phenomenon would be highly consistent with the finding, already reported, that premiums rise much less than proportionately with expected expenses due to age. Finally, it also means that the overall or average extent to which premiums vary with risk reflects a mix of potentially strong risk rating at first issue and no risk rating upon renewal.

This time we looked at three different and newer data sets, each larger than the 1987 National Medical Expenditure Survey we examined earlier. The sources of these more recent data are the Medical Expenditure Panel Survey (MEPS) from years 1996-2002, the Community Tracking Study’s Household Survey (CTS-HS) from years 1999 and 2001, and the National Health Interview Survey (NHIS) from years 1999-2004. One might expect there to be some differences from the earlier results. Insurance premiums are much higher now, so insurers might be less willing than earlier to tolerate higher risks. However, high risks should be more eager to get coverage.

Another change is that more states now regulate the extent to which premiums for first time individual insurance buyers can vary with risk (i.e., through required rating bands or strict community rating). It may also be that insurers have new technology to

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<sup>9</sup> M. Pauly and L. Nichols, “The Nongroup Health Insurance Market: Short on Facts, Long on Opinions and Policy Disputes,” *Health Affairs* 21, 2002: w325-w344 (published online October 23, 2002 <http://content.healthaffairs.org/cgi/reprint/hlthaff.w2.325v1>).

<sup>10</sup> M. Pauly, H. Kunreuther and R. Hirth, “Guaranteed Renewability in Insurance,” *Journal of Risk and Uncertainty* 10, 1995: 143-156. B. Herring and M. Pauly, “Incentive-Compatible Guaranteed Renewable Health Insurance Premiums,” *Journal of Health Economics* 25(3), 2006: 395-417.

identify risks and new incentives to avoid high risks when regulation permits them to do so. Finally, the federal Health Insurance Portability and Accountability Act (HIPAA) law required all states to enforce some type of guaranteed renewability provisions, but actual state regulation seems to vary.<sup>11</sup> We therefore wanted to see what is happening with more recent data.

## **SOME TECHNICALITIES: WHAT IS RISK? WHAT ARE ITS COMPONENTS?**

In this new work we follow our earlier procedure in measuring risk by expected medical expenses. We developed a multiple regression model, applied to the expenses of the insured population, to predict an individual's risk based on age, gender, and the presence of a lengthy list of chronic conditions. The factors that contribute on average to high levels of medical care spending are factors which (we assume) both consumers and insurers would take as indicators of high risk. Moreover, the quantitative importance of any such risk factor is to be measured by its contribution to expected expenses.

The first two columns of Exhibit 1 show both the distribution of actual medical spending and the estimated risk distribution as predicted by our model for the sample of candidates for individual insurance purchase. (Note that the distribution of risk is different than the distribution of actual expenses; there is less variation in the former than in the latter. To use the distribution of actual expenses to provide evidence for the "problem" of risk variation, as many analysts do, is thus potentially misleading.<sup>12</sup>) The last two columns show the variation in risk due to age and gender alone, and then the variation in relative risk, controlling for age and gender, due to health conditions. This so-called "index of condition-related expense" is the ratio of expected expense using all risk characteristics over expected expense using only age and gender. We wish to examine these distinct components of risk separately in our analysis due to the easier observability of some of the risk characteristics relative to others. Age and gender are easily observable characteristics, while the onset of a chronic disease (and the above average medical costs for subsequent years) is uncertain and may be hard for insurers to detect.<sup>13</sup>

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<sup>11</sup> V. Patel and M. Pauly, "Guaranteed Renewability and the Problem of Risk Variation in Individual Health Insurance Markets," *Health Affairs* 21, 2002: w280-w289 (published online August 28, 2002 <http://content.healthaffairs.org/cgi/reprint/hlthaff.w2.280v1>).

<sup>12</sup> M. Berk and A. Monehit, "The Concentration of Health Care Expenditures, Revisited," *Health Affairs* 20(2), 2001: 9-18.

<sup>13</sup> The risk measures in our data obviously do not include all of the information an insurer might have or use to determine risk. If insurers use other measures, the risk attributable to them might have a different relationship to premiums than the risk we measure. However, there is no reason to think that the relationship we measure is different.

## **WHAT THE MORE RECENT DATA ON PREMIUMS SHOW**

Exhibit 2 illustrates our main findings. It compares the actual medical costs, the expected medical costs, and individual insurance premiums for single-person policies, splitting the sample by those either in the lower or upper half of risk (i.e., expected expense). As the MEPS data shows, the predicted high risks (above the median) have both high expected expenses (before the fact) and high actual expenses (after the fact); they are roughly four times higher compared to the bottom half. But the premiums higher risk people actually pay are only, on average, about 1.6 times those of the lower risks. While there may be some variation with risk in extent of coverage for those who have coverage, even the direction of such variation is uncertain and need not be related to whether or not some insurance is purchased. At least half of their higher expected expense appears to be pooled, even in the individual market. The average premium reflects the experience both of new purchasers and those who renew.

Could it be that we do not observe proportionately higher premiums charged to higher risks because insurers are using underwriting to deny the seriously ill among them coverage or (what is really the same thing) quote them so high a premium they decide not to buy? Then they would not be included in our sample of transactions. Exhibit 3 shows the condition-related component of our measure of expected expense, broken down both by income level and current insurance status: employment-based insurance, individual insurance, uninsured, and Medicaid. Comparing the measure of condition-related expected expense between high-income people with individual insurance (0.959) and those who are uninsured (0.997) does provide some support for a modest number of high risks being pushed from the individual market to the ranks of the uninsured, but the comparisons for the low-income people do not imply that similar displacement occurs for them. The overall results do suggest the average health status for those with private insurance (whether group or individual) does not markedly differ from those who are uninsured (though there may well be more variation among the uninsured). Those covered by Medicaid, by contrast, have much higher risk and much higher condition-related expenses, as one would expect.

In our more rigorous analyses of these new data, we nevertheless make a statistical adjustment to account for the possibility that some of the higher risks in the “potential” individual market were denied coverage.<sup>14</sup> Using a “selection correction” regression model approach for both the CTS-HS and NHIS samples, we do find that higher health risk is statistically significantly related to higher premiums overall.

While premiums do rise with risk, as indicated, each of these measures of the relationship between premiums and risk are well below unity--premiums are definitely far from proportional to risk, so there is a substantial amount of risk pooling present.

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<sup>14</sup> More detail regarding the methodology used to generate these results can be found in B. Herring and M. Pauly, “The Effect of State Community Rating Regulations on Premiums and Coverage in the Individual Health Insurance Market,” NBER Working Paper #12504, August 2006.

The average increase in premium due to increases in the demographic component is between 32.8 and 48.0 percent, similar to what it was in our earlier work. The health conditions component, though statistically significant, has in contrast a much lower relationship, between 11.5 and 15.5 percent in these two data sets. Although in this data people of a given age and gender with chronic health conditions pay higher premiums than people without, individual insurance, though guaranteed renewability or some other device, pools between 84.5 and 88.5 percent of the risk due to the random effect of chronic conditions. We also examined the relationship between conditions and premiums for new insurance purchasers only; the relationship in this smaller sub-sample was not statistically significant.

To sum up, both recent data sets show that, even after HIPAA and some increase in state regulation, the average relationship of premiums paid to risk for the full sample is quite similar to the relationship measured earlier. Premiums paid still do increase with risk, but they still increase much less than proportionately. The risk factors that are most important in predicting higher premiums are the person's age and gender--the demographic variables; chronic conditions per se matter, but their effect is quite small relative to their effect on risk.

## **THE EFFECT OF REGULATION ON THE RELATIONSHIP BETWEEN PREMIUMS AND RISK AND ON THE RELATIONSHIP BETWEEN COVERAGE AND RISK**

A minority of states regulate, to various extents, the way in which insurers are allowed to vary premiums with risk and/or reject applicants based on risk. The strongest case (in New York) is full community rating, in which an insurer must charge the same premium for the same policy to everyone in a community. A few other states use "modified community rating," which allows premiums to vary with age but not with health status. Some states put bands on the way premiums may vary with risk and put some but less stringent limits on underwriting practices.

There is no bright line that perfectly distinguishes states that regulate rating of premiums from those who do not, because virtually every state can forbid premiums that are "arbitrary," while the definition of arbitrariness is itself arbitrary. We therefore selected two groups: six states as those with the reputation of being the most aggressive regulators using either full or modified community rating along with guaranteed issue versus 34 states with no rating regulations or guaranteed issue

laws.<sup>15</sup> We compare how premiums (and insurance coverage further below) vary with health condition-related risk, given age and gender, in these two groups of states.

The results in Exhibit 4 suggest that the small but positive effect of health conditions on premiums observed in the regression analysis described earlier exists (to a statistically significant extent) only in the unregulated states. We also found (in results not shown) that the higher premiums for sicker people in these unregulated states are largely confined to low-income people. Apparently higher income high risks in less regulated states either find lower premiums that they are willing to pay or are more likely to have previously obtained insurance with a guaranteed renewability feature.

The next part of the study looked at the relationship between risk and the probability of obtaining coverage. What, if anything, does the risk-premium relationship, and variation in it caused by regulation, do to the risk-coverage relationship?

We assume that the intent of regulation is to increase overall coverage; does it do so?<sup>16</sup> We must specify who the potential buyers in the individual market are. Here we assume that individuals who have no family member currently working at a firm, or who are not currently covered by employment-based insurance, are the candidates for individual insurance. Because of the high loading in individual insurance, however, the fraction of people in this set, at any risk level in any state, who actually buys coverage is relatively small.

Does regulation then matter for the relationship between risk and coverage? Exhibit 5 shows the relative rates of obtaining individual insurance coverage for various percentiles of risk (measured by expected expense), split between those states with neither rating nor issue regulations versus those with both community rating and guaranteed issue; these relative rates of are normalized to the average proportion insured in the sample.

The effect of health risk on insurance coverage is negative and statistically significant in unregulated states, relative to an insignificant effect in heavily regulated states. However, the difference in the estimated relationship between risk and coverage between regulated and unregulated states is small in magnitude.

To be specific: high risk people (at the 90<sup>th</sup> percentile of the risk distribution, conditional on age and gender) are 91.5-92.9 percent as likely to obtain coverage as an average risk person in unregulated states, compared to no difference in likelihood of coverage by risk level in regulated states. Thus regulation increases the relative

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<sup>15</sup> States with community rating and guaranteed issue regulations during this time period include Maine, Massachusetts, New Hampshire, New Jersey, New York and Vermont. (States with no rating regulations or guaranteed issue include Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin and Wyoming).

<sup>16</sup> A referee suggests that regulators may only be concerned about coverage of higher risks and unconcerned about lower risk people becoming uninsured. This is not the assumption we make.

likelihood of coverage for high risks by 7.1-8.5 percent. (Had we defined high risk people as those with high expected expenses based both on age/gender and the presence of chronic conditions, the impact of regulation would have been much smaller, with the proportion varying by extent of regulation by less than 2 percent.)

However, this modest difference does not necessarily translate into the conclusion that regulation helps the uninsured overall. There are two edges to the community rating or premium averaging sword; to help higher risks buy coverage, it discourages lower risks from doing so. Thus regulation may help only some of the uninsured by harming others.

The last relationship to be investigated is therefore the following question: how is premium regulation related to the total proportion (at all risk levels) who remain uninsured? That is, compared to unregulated states, does regulation bring in more high risks than it discourages low risks? We obviously cannot simply compare the proportions uninsured in regulated and unregulated states, because there are many other factors, some unknown, that influence insurance purchasing across states; it would be hard to tease out the effect of regulation alone. So we use the results from our analysis of the effect of regulation on purchasing by different risks in a simulation analysis.<sup>17</sup>

As already noted, regulation increases the relative likelihood that higher risks will obtain coverage compared to lower risks. Since this change in mix in the insurance purchasing pool raises the average level of risk, competitive insurance markets will require average premiums to increase, relative to unregulated states (other things equal). This increase in premiums will then cause high risks and low risks both to drop coverage--the magnitude of which we can simulate using established estimates for the responsiveness of insurance purchasing to price.

In a "first round" that does not yet incorporate the effect of increased premiums on coverage, we use the previous model to estimate how regulation would affect the mix of risks. For example, we estimate that regulation would increase the relative rates of insurance from between 0.915 and 0.929 to between 1.003 and 1.032 at the 90th percentile of risk, and would reduce the relative rate of insurance from between 1.029 and 1.045 to between 0.999 and 0.980 at the 10th percentile of risk.

The "second round" incorporates the effect of this shift in composition of insurance coverage by risk on the average premium. Using the results for the distribution of expected expense for those in the CTS-HS and NHIS, we estimate that the shift in composition of insureds from lower to higher risks due to regulation will increase the average premium by approximately 12.0-14.8 percent. This, in turn, will result in a decrease in the percentage insured by 6.0-7.4 percent--using a consensus estimate of

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<sup>17</sup> This is a simplified version of the well-accepted model developed by K. Subramanian, J. Lemaire, J.C. Hershey, M.V. Pauly, K. Armstrong and D.A. Asch, "Estimating Adverse Selection Costs from Genetic Testing for Breast and Ovarian Cancer: The Case of Life Insurance," *Journal of Risk and Insurance* 66(4), 1999: 531-550.

the price elasticity of insurance.<sup>18</sup> This calculation yields the results shown in the right side of Exhibit 5, where the “baseline” average relative rate of insurance coverage is now between 0.926 and 0.940 for states with community rating and guaranteed issue regulations. That is, these regulations reduce the overall proportion of eligibles in the individual market with insurance by between 6.0 and 7.4 percent.

## CONCLUSION

What is striking about these estimates is not their precise magnitude, but rather the fact that their magnitude is small. The effects of rate regulation on relative probability of insurance purchasing in the individual insurance market are exceedingly modest, especially when compared to the overall shortfall of 74 percent of the eligible population in this market who did not buy insurance at all. The reason for so small an effect of regulation is, we believe, precisely because there is a very high level of risk pooling in this market even in the absence of regulation; there is not much more that regulation can (or, apparently, does) do. That the effect of rate regulation on overall coverage is also rather small (even if negative) probably helps to explain why informal cross state analyses of those regulated states whose insurance markets have not collapsed fail to find much;<sup>19</sup> there is too much turbulence to measure this little zephyr.

The individual market’s main failing is not how it treats high risks but how it treats all risks: by charging them all high premiums relative to the value of benefits, and by not being able to offer them the generous tax subsidies available to group insurance, it performs poorly. Perhaps the development of ways to lower the administrative expenses for individual insurance across the board, rather than further tinkering with the structure of high premiums, would be the most helpful public policy.

Here is an additional reason for this conclusion: while regulation does slightly increase the number of high risk low-income people who obtain coverage compared to unregulated risk rating, the overall proportion of low-income people at all risk levels who are willing to buy individual insurance coverage is so low, at less than 10 percent, that in the end very few people are helped. In contrast, even in relatively unregulated states the individual market treats middle income higher risks rather well. It pools a very large fraction of total risk, and it gets coverage to people who are higher risk by virtue of being older.

Lowering administrative cost or creating high risk pools, rather than rate regulation, would also avoid regulation-induced incentives to insurers to avoid money-losing high risks. Our analysis strongly suggests that insurance policymakers should be much less concerned about the “Achilles heel” of risk variation and more concerned about victory

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<sup>18</sup> S. Glied, D. Remler, and J. Graff Zivin, “Inside the Sausage Factory: Improving Estimates of the Effects of Health Insurance Expansion Proposals,” *The Millbank Quarterly* 80(4), 2002: 603-635.

<sup>19</sup> T. Buchmueller and J. DiNardo, “Did Community Rating Induce an Adverse Selection Death Spiral? Evidence from New York, Pennsylvania, and Connecticut,” *American Economic Review* 92(1), 2002: 280-294. D. Chollet and R. Paul, *Community Rating: Issues and Experience*, Alpha Center, December 1994.

in the overall effort to make individual insurance more affordable to more people at all risk levels.

## EXHIBITS

<b>EXHIBIT 1: Distribution of Actual and Expected Expenses Potentially Privately Insured Individuals</b>				
	<b>Actual Expense</b>	<b>Expected Expense</b>	<b>Expected Expense Based Only on Age and Gender</b>	<b>Index of Condition-Related Expected Expense</b>
Mean	1,840	1,817	1,759	1.01
99th percentile	22,349	10,351	4,710	3.95
95th percentile	7,954	4,064	4,110	1.81
90th percentile	4,263	3,079	3,359	1.32
75th percentile	1,358	2,086	2,345	0.95
50th percentile	367	1,461	1,516	0.88
25th percentile	56	750	800	0.78
10th percentile	0	546	577	0.72
N =	82,711	90,756	90,756	90,756
<b>SOURCE:</b> 1996-2002 MEPS data.				
<b>NOTES:</b> Values are given in 2002 dollars. Expected expenses are derived from the authors' calculations.				

<b>EXHIBIT 2: Expected Expense and Individual Insurance Premiums Single-Person Coverage</b>			
	<b>Average Actual Expense</b>	<b>Average Expected Expense</b>	<b>Average Individual Insurance Premium</b>
<b>MEPS data (N = 871)</b>			
Low expected expense	1,005	1,074	2,178
High expected expense	3,330	4,253	3,308
<b>CTS-HS data (N = 1,459)</b>			
Low expected expense	N/A	1,010	1,539
High expected expense	N/A	4,924	2,430
<b>NHIS data (N = 2,452)</b>			
Low expected expense	N/A	1,361	2,208
High expected expense	N/A	3,525	3,777
<b>NOTES:</b> Expected expenses are derived from the authors' calculations. Low and high expected expense are defined as above and below the median expected expense for each sample.			

<b>EXHIBIT 3: Prevalence of Chronic Health Conditions by Insurance Status and Income</b>				
	<b>Index of Condition-Related Expected Expense:</b>			
	<b>Employment-Based Insurance</b>	<b>Individual Insurance</b>	<b>Uninsured</b>	<b>Medicaid</b>
Low-income	1.045	1.025	1.023	1.183
High-income	1.003	0.959	0.997	N/A

**SOURCE:** 1996-2002 MEPS data.  
**NOTES:** Expected expenses are derived from the authors' calculations. Low and high-income are defined as below and above 300% of the federal poverty level, respectively.

<b>EXHIBIT 4: The Effect of State Rating Regulations on the Percent Change</b>				
	<b>States with No Rating or Issue Regulations:</b>		<b>States with Community Rating and Guaranteed Issue Regulations:</b>	
	<b>Expected Expense from Age and Gender</b>	<b>Index of Condition-Related Expected Expense</b>	<b>Expected Expense from Age and Gender</b>	<b>Index of Condition-Related Expected Expense</b>
CTS-HS data	35.6%***	7.4%**	54.5%***	2.3%
NHIS data	46.5%***	10.8%**	25.1%**	6.9%

**SOURCE:** These estimates are from B. Herring and M. Pauly (2006), cited in Note 13; they are derived from a selection-correction model for individual insurance premiums.  
**NOTES:** Standard errors are given in brackets. Statistical significance: <0.01 (\*\*\*); 0.01-0.05 (\*\*); 0.05-0.10 (\*). Low and high-income are defined as below and above 300% of the federal poverty level, respectively.

<b>EXHIBIT 5: Effect of Rating Regulations on Overall Insurance Coverage: Relative Rates of Insurance Coverage</b>		
<b>Expected Expense</b>	<b>No Rating or Issue Regulations</b>	<b>Community Rating and Guaranteed Issue Regulations</b>
CTS-HS data: average	1.000	0.940
95th percentile	0.899	0.984
90th percentile	0.929	0.970
75th percentile	0.974	0.951
50th percentile	1.017	0.932
25th percentile	1.027	0.929
10th percentile	1.045	0.921
5th percentile	1.056	0.917
NHIS data: average	1.000	0.926
95th percentile	0.882	0.930
90th percentile	0.915	0.929
75th percentile	1.006	0.926
50th percentile	1.014	0.926
25th percentile	1.020	0.925
10th percentile	1.029	0.925
5th percentile	1.044	0.925
<p><b>NOTES:</b> Estimates are derived from a multivariate model for insurance coverage from B. Herring and M. Pauly (2006), cited in Note 13. Relative rates of insurance coverage are normalized to the average rate of insurance coverage in states with low levels of rating regulations. The average difference between states low and high rating regulations are not actual differences but are instead simulated differences.</p>		