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The Evolution of Medical Spending Risk

Jonathan Gruber and Helen Levy

For at least a half-century, the risk of high medical spending, combined with doubts concerning the ability of private insurance markets to provide adequate coverage against this risk, has provided one of the powerful arguments for government interventions to promote health insurance coverage. In the 1960s, for example, these concerns helped lead to the establishment of Medicare for the elderly and Medicaid for the poor. In more recent decades, similar concerns have led to the Consolidated Omnibus Budget Reconciliation Act of 1986, commonly known as COBRA, which provides displaced workers continued access to employer-sponsored health insurance; to the Health Insurance Portability and Accountability Act of 1996 (HIPAA), which limits the restrictions that can be placed on insurance coverage when workers change jobs; to the State Children’s Health Insurance Program (SCHIP) program, which provides subsidized health insurance coverage for low-income children; and to Medicare Part D, the single largest expansion of Medicare benefits since the program’s inception, which has provided drug coverage for senior citizens since 2006.

These public policy changes have occurred against a backdrop of dramatic increases in aggregate spending on health as well as changes in the nature of both group and individual health insurance markets. Considerable evidence suggests that these changes are causally linked: that is, public insurance, private insurance,
medical technology, and health spending are all simultaneously determined.\textsuperscript{1} Our goal here is not to try to solve the chicken-and-egg problem of how important each of these causal links is in explaining trends in coverage and spending over the past several decades. Rather, our goal is to focus on the bottom line: how has the economic risk of health spending changed over time for U.S. households?\textsuperscript{2}

We begin with some basic facts concerning trends in aggregate health spending in the United States. It is fairly well-known that health spending has tripled as a share of GDP in the past 50 years. However, it is less well-known that this rise has virtually all been absorbed by increased insurance, with little increase in out-of-pocket exposure for individuals. While individuals paid almost 70 percent of their medical costs out-of-pocket in 1960, that share has fallen to 26 percent today. Increased spending on health has instead manifested itself primarily in rising insurance spending, particularly for the public sector.

Next, we turn to a discussion of how private insurance markets and public insurance programs have changed over time. We find that, even as health care costs have been rapidly rising, private insurance has remained almost as generous as before, while public insurance has gotten much more generous. These patterns are consistent with the overall decline in the share of health spending borne by households as out-of-pocket medical spending and the general rise in risk bearing by the public sector.

We then present evidence from Consumer Expenditure Survey microdata on how the distribution of household spending on health—that is, out-of-pocket payments for medical care plus the household’s share of health insurance premiums—has changed over time. We find (not surprisingly given the trends in the aggregate data) that this distribution has shifted up over time: households spend more on medical care and insurance than they used to. But in terms of measuring how risk has changed over time, it is not the mean but the dispersion of this distribution that is of interest. We consider two measures of dispersion that serve as proxies for household risk: the standard deviation of the distribution of household health spending and the ratio of the 90\textsuperscript{th} percentile of spending to the median (the so-called “90/50 gap”). We find, surprisingly, that neither has increased despite the rapid rise in aggregate health spending. This conclusion holds true for broad subgroups of the population (for example, the nonelderly as a group) but not for some narrowly-defined subgroups (for example, low-income families with children), as we discuss in more detail below. We next turn to the question of how much risk households should face, from the perspective of economic efficiency.

\textsuperscript{1} For example, Newhouse (1992) identifies technological innovation as the primary driver of health care spending; Finkelstein (2007) argues that Medicare is at least as important; Cutler and Gruber (1996) and Gruber and Simon (2008) discuss the effect of public insurance expansions for children on private coverage (“crowd-out”), just to name a few papers that have addressed different links in this causal web.

\textsuperscript{2} The economic risks arising from poor health include both medical costs not covered by health insurance and income loss associated with disability. Our focus here is on the former; for a review of the issues surrounding disability and the role of Disability Insurance, see Autor and Duggan (2006) in this journal.
Household risk may not have changed much over the past several decades, but do we have any evidence that this level represents either too much or too little risk? We conclude with a discussion of the implications for public policy—in particular, for current debates over expanding health insurance coverage to the uninsured.

**Health Spending: Aggregate Time-Series Evidence**

The United States has seen a tremendous increase in aggregate health spending relative to income. The bottom line in Figure 1 shows a familiar trend: the share of GDP devoted to health has more than tripled in the last half-century or so, rising from 5.2 percent of GDP in 1960 to over 16 percent in 2007 (National Health Expenditure Accounts, 2007).

Figure 1 also shows two trends that may be less familiar. One is the share of total health spending that is borne by the private sector (households and businesses) rather than government, calculated from the National Health Expenditure Accounts for 2007. The private sector was directly responsible for 68 percent of health spending in 1960 and only 47 percent in 2007; most of this decline occurred between 1960 and 1975, when the private sector share was 51 percent. Thus, an increasing share of the burden of aggregate health spending has shifted to the public sector.

The other potentially unfamiliar line in Figure 1 shows the declining fraction of private health spending that is devoted to out-of-pocket payments for medical care, as opposed to health insurance premiums. In 1960, out-of-pocket spending on
medical care accounted for 69 percent of total private health spending. By 2007, this share was only 26 percent. Households are channeling an increasing share of their health spending through insurance premiums.

Both of these trends—increasing roles for government and for private insurance, relative to household out-of-pocket spending on medical care—buffer the effect on households of aggregate spending increases on health.\(^3\) To see what has happened to real private spending over time, Figure 2 relies on the same underlying data as Figure 1 but presents trends in real spending per capita. (Nominal spending was converted to real 2007 dollars using the Consumer Price Index for all urban consumers; Census Bureau total population counts were used to calculate spending per capita.) Using this metric, private health spending (as shown by the top line with circles) increased from about $700 to $3,500 between 1960 and 2007, a five-fold increase. But the lion’s share of this increase—almost all of it, as is evident in Figure 2—is because of higher spending on insurance (the solid line);

\(^3\) Of course, the ultimate incidence of both taxes and premiums is on households, so they bear the burden of financing health care even when it is nominally paid for by government or insurance. But taxes and insurance premiums are relatively predictable expenses compared to out-of-pocket spending for medical care and so represent less risk for households.
private out-of-pocket spending has not quite doubled (the dashed line) even as real health spending per capita has increased by a factor of seven. Moreover, government health spending over the same period (shown by the line with squares) increased from about $250 to $3,500, a 13-fold increase. In other words, household spending has increased, but this increase may be less striking than the shift away from out-of-pocket spending on medical care and toward both public spending and private spending on insurance premiums.

These aggregate shifts raise the possibility that, on average, household health spending risk may actually have decreased over time—or at least may not have increased as much as the tremendous increase in our nation’s aggregate health spending might suggest. Of course, the aggregate data cannot conclusively answer this question. In economic terms, exposure to risk is about not the mean of spending but its dispersion; Pauly (2007) provides an excellent discussion of this point in the context of health insurance. Moreover, estimates of risk at the population level may obscure the fact that risk is increasing for some subgroups but remaining stable or even decreasing for others.

To understand better how household risk may be changing, we turn now to a discussion of changes in private insurance markets and public insurance programs. Changes have occurred over time both on the extensive and the intensive margins; that is, both in how many people are covered by each type of insurance and in the generosity of each type of coverage conditional on having it. We also present trends in the fraction of the population with no coverage. We then consider changes over time in the distribution of household spending on out-of-pocket medical care and health insurance using microdata from the Consumer Expenditure Survey for 1980 through 2007. Has this distribution become more dispersed—implying more risk facing households? How does this vary for different subgroups? Because of the sharp change in insurance coverage at age 65 as a result of Medicare, we consider the nonelderly (under 65) and the elderly (65 and older) separately.

Health Spending Risk and the Nonelderly

The Evolution of Insurance

The major form of protection against medical care spending risk for nonelderly individuals in the United States is private health insurance, in particular health insurance that is provided as a fringe benefit of employment. About two-thirds of the population has private health insurance, almost all of which (88 percent) is provided through employers (DeNavas-Walt, Proctor, and Smith, 2008). One reason for the link between employment and insurance is that employer-paid insurance premiums—unlike premiums for individual insurance policies—are excluded from workers' taxable income (Thomasson, 2003). The value of foregone revenue associated with this exclusion was estimated at $125 billion in 2006, or nearly twice
the $68.3 billion value of the home mortgage interest deduction, making it the federal government’s largest tax expenditure (Tax Policy Center, 2006).

Figure 3 shows trends in private health insurance coverage among the nonelderly since 1989, based on data from the March Current Population Survey, for four groups based on age and education level, where education level can be considered as a proxy for socioeconomic status in general. Low-education adults are defined as those having a high school education or less; high-education adults are those with at least some college education. These educational groupings split the sample roughly in half. Children are assigned to low-education or high-education categories based on their parents’ status. Figure 3 illustrates several patterns. First, for children and adults with higher levels of education and socioeconomic status, private insurance has been quite stable since the early 1990s. Children and adults in these families have similar rates of coverage. The situation for families with lower levels of education and lower socioeconomic status is quite different on both fronts; for both adults and children in these categories, private health insurance coverage has declined significantly over this period. To the extent that private health insurance is on the decline—and the data do not suggest that its collapse is imminent, media coverage to the contrary notwithstanding—this phenomenon appears concentrated among families with lower levels of education.

4 This figure represents foregone revenue for income tax purposes only; there was another roughly $80 billion in 2006 in foregone revenue from the exclusion of insurance payments through payroll taxes as well.
and socioeconomic status, which is consistent with earlier research showing that declines in employer-sponsored health insurance are concentrated among part-time and low-tenure workers (Farber and Levy, 2000).

Finally, within the overall category of low education and socioeconomic status, children are less likely than adults to have private insurance at any point in time. Both the decline in private coverage for low-education families and the fact that children from such families are less likely than adults in these families to have private coverage are likely due at least partially to public programs targeting children with low socioeconomic status, programs which we describe in more detail below.

This decline in private health insurance coverage is striking when contrasted with results, already presented, showing a rapidly increasing share of health spending being borne by insurance. Taken together, these findings suggest that health insurance has become more generous for those who have it, even as the share of individuals with insurance has fallen.

A first way in which health insurance has become more generous involves changes in coinsurance (the share of medical bills paid by the household) and other point-of-service cost sharing. Health insurance has shifted away from fee-for-service contracts which typically rely on patient cost-sharing to control costs, towards capitated plans like health maintenance organizations, which are typically close to free for the patient at time of using services and instead rely on supply-side cost controls. Among those with fee-for-service contracts, data from the Kaiser Family Foundation suggest that 20 percent coinsurance and a $1,000 deductible have been the norm for a number of years (Kaiser Family Foundation, 1999, 2008). Typical copayments for an office visit for policyholders in employer-sponsored plans that use copayments rather than coinsurance increased from $10 to a still-modest level of $15 or $20. Thus, patient cost-sharing has stayed relatively constant while underlying medical costs have risen dramatically, which is consistent with a relative rise in the protection offered by insurance over time.

A second dimension along which insurance has become more risk-protective is in the increased portability of employer-sponsored insurance. State and federal “continuation-of-coverage” requirements hold that employers must make available employer-sponsored insurance to workers that leave the firm, albeit at 102 percent of the total cost of that insurance (which greatly exceeds the typical share of health insurance costs borne by active employees). These laws were introduced by states beginning in the late 1970s, and coverage was mandated by the federal government under the Consolidated Omnibus Budget Reconciliation Act of 1986, commonly known as COBRA. A large literature has sought to understand the implications of continuation-of-coverage regulations. The general conclusion is that they substantially mitigate the rate of uninsurance among displaced workers, while at the same time increasing mobility from job to job and from the labor force to retirement (Gruber and Madrian, 2004). While continuation coverage remains quite expensive for most displaced workers, the American Recovery and Reinvestment Act of 2009 included a sizeable subsidy towards the cost of this coverage—up to
65 percent of the cost. It will be interesting to study how this subsidy affects continuation coverage.

Private insurance has become more protective along a third dimension, and this stems from state and federal regulations on benefits and pricing in insurance markets. For example, all states have mandated certain benefits that must be included in the health insurance package of that state, most commonly for substance abuse. A number of benefits are federally mandated as well, most notably comprehensive coverage for the costs of maternity. States regulate the availability and in some cases the pricing of nongroup insurance, and the federal government added a layer of regulation to this sector as well under the Health Insurance Portability and Accountability Act of 1996. However, it is unclear whether or how these government interventions actually serve to mitigate the risk of high health care costs. A standard tradeoff arises here: mandating benefits will raise insurance prices, but the mandated benefits may not be fully valued by the insured. Therefore, as a result of the mandated benefits, those who remain insured have more comprehensive insurance, but some who do not value the mandated benefits may drop insurance altogether and end up facing greater risks. Requiring the continuation of employer-mandated benefits under the COBRA legislation does not seem to have caused any erosion of employer-sponsored insurance coverage (Gruber, 1994). In terms of insurance market regulations, however, considerable evidence of such a tradeoff exists. For example, Simon (2005) suggests that regulation of the small employer insurance market—such as restrictions on experience rating of premiums and guaranteed issue requirements—caused overall rates of coverage to drop by about two percentage points.

At least in part because of the failure of private insurance markets to provide coverage for a substantial fraction of families, public insurance programs cover vulnerable groups, including low-income children and pregnant women. Public coverage for the nonelderly has expanded significantly over the past two decades, largely as a result of eligibility expansions for low-income children.\(^5\) We review these changes briefly here; for more detail, see Gruber (2003).

In the early 1980s, the Medicaid program—which was enacted in 1965 as a companion to Medicare—provided coverage almost exclusively to families receiving cash welfare through the Aid to Families with Dependent Children (AFDC) program. Eligibility was gradually expanded, however, to children and pregnant women in families who did not meet the criteria for AFDC, typically because their incomes were too high. For example, the Omnibus Budget Reconciliation Act (OBRA) of 1989 required all states to cover children under the age of six in families with incomes less than 133 percent of the poverty level by 1990; as a follow-up, the OBRA legislation in 1990 required a phase-in of coverage of older children in families up to 100 percent of the poverty level. Public insurance coverage was

\(^5\) There has also been an increase in the fraction of adults under the age of 65 receiving Medicare, which is likely to be due to increases in receipt of Disability Insurance. We do not focus on this trend here. For a discussion of the increase in Disability Insurance, see Autor and Duggan (2003).
extended further by the creation of the State Children’s Health Insurance Program (SCHIP) in 1997, which allowed states either to create new public insurance programs for children or to expand their Medicaid programs further or both. As a result, public coverage became available to even higher-income groups of children: up to 350 percent of poverty in one case (New Jersey in 2001) and 300 percent in several others (Connecticut, Maryland, and Missouri in 2001). In some states, parents in low-income families are eligible for SCHIP coverage as well.

These changes add up to a big increase in public health insurance coverage for low-income children. Figure 4 shows trends in public coverage—including Medicare, Medicaid, and SCHIP—for the same four groups used in Figure 3. The top line shows that almost 40 percent of children from lower-education families have public coverage in 2007—nearly twice the fraction that had it in 1989. The increase for children in higher-education families is smaller in absolute terms, from 5 percent to 13 percent (although larger in proportional terms). Public coverage has increased for adults, too; a more detailed examination of the data shows that all of the increase for adults is due to Medicare, rather than Medicaid or SCHIP.

The net effect of these decreases in private coverage and increases in public coverage is shown in Figure 5. The fraction of uninsured children, whether in high-education or low-education families, increased somewhat in the late 1990s, but by 2007 was back to its 1988 level. Uninsurance among adults, on the other hand, has increased, particularly for adults with lower levels of education.

It may seem to go without saying that the uninsured are exposed to greater risk than the insured. But several sources of “implicit” health insurance do exist for the
uninsured—that is, resources that would help pay for medical care if they needed it. The first of these, relevant primarily for low-income children, is “contingent” coverage from Medicaid and SCHIP. About 60 percent of uninsured U.S. children are eligible for free public insurance, yet are not covered by it (Selden, Hudson, and Banthin, 2004). Their risk of medical spending is mitigated because medical providers, especially hospitals, have a strong incentive to enroll eligible uninsured individuals into public insurance programs when they arrive at the hospital needing care.

A second implicit insurance mechanism is the provision of subsidized or free care by medical providers, also known as uncompensated care (Cunningham and Kemper, 1998; Hadley and Cunningham, 2004; Weissman, 2005). By law, hospitals receiving federal funds (essentially all hospitals) are required to treat all patients with emergency conditions, regardless of insurance status, and hospital uncompensated care has grown substantially over time. We calculate—using nominal figures from the American Hospital Association (2008) and converting into real dollars using the Consumer Price Index for urban consumers—that hospital uncompensated care grew in real 2007 dollars from less than $5 billion in 1980 to almost $35 billion in 2007. However, this spending has remained very stable as a percentage of hospital revenues, in the 5 to 6 percent range (American Hospital Association, 2008). Roughly two-thirds of this amount is provided to the uninsured, while

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**Figure 5**

Uninsurance among the Nonelderly

![Graph showing uninsurance rates among the nonelderly from 1988 to 2007.](image)


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Children make up about 20 percent of the uninsured in 2007 (our calculations using the March 2008 CPS) so that the number of uninsured in the United States would be about 12 percent lower (.20 X 60%) if all of these children were counted as insured.
the remaining third is for the insured who do not pay some portion of the hospital bills (Gruber and Rodriguez, 2007). The picture is less clear for physicians, who are not required by any law to treat the uninsured; indeed, Gruber and Rodriguez (2007) find that, overall, the physician sector does not provide uncompensated care.

Finally, bankruptcy offers a kind of last-ditch insurance for households, both uninsured and insured ones, with medical bills that they are unable to pay. Surveys of bankruptcy filers suggest that medical causes are to blame for between 20 and 50 percent of bankruptcies, depending on how broadly “medical causes” is defined (Himmelstein, Warren, Thorne, and Woolhandler, 2005; Dranove and Millenson, 2006). Analysis of nationally-representative longitudinal data by Keys (2009) suggests that the onset of a work-limiting disability increases the likelihood of filing for bankruptcy by a factor of 2.6. Gross and Notowidigdo (2007) find that expansions of eligibility under the Medicaid program are associated with lower rates of bankruptcy; their finding suggests that out-of-pocket medical spending is pivotal in about one-quarter of U.S. bankruptcies. Although no one would argue that bankruptcy is a desirable outcome—and indeed, Himmelstein, Warren, Thorne, and Woolhandler (2005, 2006) and others have argued that the importance of poor health as a proximate cause for bankruptcy is an indictment of our current system of financing medical care—it does offer an escape hatch for those facing medical bills that they are unable to pay and, therefore, a measure of protection against the risk of high spending.

The net effect of these implicit insurance mechanisms is that one way or another, the uninsured consume some medical care for which they do not pay; or to put it another way, even the uninsured are not fully exposed to the risk of medical expenses they incur. Herring (2005) estimates that low-income uninsured individuals (those with family incomes below 300 percent of poverty, who constitute the majority of the uninsured) pay for about one-third of the medical care they receive; for the high-income uninsured, the fraction is closer to one-half.

Empirical Evidence on the Distribution of Household Health Spending for the Nonelderly

With this background on changes in insurance in mind, we turn to empirical evidence on the distribution of health spending by the nonelderly households, using data from the Consumer Expenditure Survey Interview Component. An additional source of implicit insurance for both insured and uninsured households with high spending is the tax deductibility of medical expenses exceeding 7.5 percent of adjusted gross income (Selden, 2008).

Our sample of nonelderly households in the Consumer Expenditure Survey Interview Component (that is, households with a reference person under the age of 65) includes 518,157 observations in all—between 11,000 and 25,000 in each year. We dropped the approximately 1 percent of households with reported health spending that is either negative or greater than their total spending. This trimming has no effect on the median, 90th percentile, or the 90/50 gap; it eliminates some dramatic outliers in the standard deviation but does not affect observed lack of trend in the standard deviation. The elderly sample is about one-quarter this size.
Household health spending in these data includes both out-of-pocket spending for medical care at the point of service—including coinsurance and any spending that is not covered by insurance—as well as the household’s share of health insurance premiums.9 We consider two measures of risk: The first is the standard deviation in spending across households. The second is the ratio of the 90th to the 50th percentile of spending (90/50 gap); results are similar if we use a more extreme measure such as the 95th percentile. It is important to emphasize that these are only proxies for the measure of risk that would be theoretically appropriate, since the observed distribution of health spending for a particular group is not the same as the distribution of health spending risk facing members of that group. On the other hand, these summary measures of dispersion should provide some sense of whether risk is increasing or decreasing over time.

Figure 6 shows descriptive statistics on the distribution of household health spending (out-of-pocket medical care and plus the household’s share of insurance premiums) as a fraction of total budgets for all nonelderly households over time. A median nonelderly household—shown by the bottom line in the figure—spent about 2 percent of its budget on health in 1980 and slightly more, 2.6 percent, in 2007. Over the same period, the 90th percentile of this distribution increased from 9.7 to 12.2 percent. This increase is about the same in proportional terms as the increase at the median, so the nonelderly are spending more on health (which is not news) but are not necessarily at greater risk than before. Thus, the ratio of the 90th to the 50th percentile is essentially flat over time. Similarly, the standard deviation of spending across households is also relatively flat over time. The implications are striking: despite an enormous rise in the share of our national economy devoted to health, the overall risk of household spending on health has not risen for the nonelderly.

Does this broad conclusion apply to different subgroups of the population for which we know insurance coverage has changed? We focus in this section on a particularly interesting division of the data into families with or without children, and as a proxy for socioeconomic status, we divide the families as before into those with a high school education or less and those with at least some college education. Table 1 shows patterns for these groups in four years: 1980, 1989, 1998, and 2007. For families in the higher of the two education groups, with and without children, and for families in the low-education group without children, the story is fairly similar to what we saw for the nonelderly as a whole: a very modest rise in both the median and 90th percentile so that the ratio of 90th to median is fairly constant, and little change in the standard deviation. In other words, for these groups, risk has not changed much over this 27-year period.

However, for the families with lower education levels and with children—the

9 Note that the Consumer Expenditure Survey data used here, unlike the aggregate data that form the basis for Figures 1 and 2, does not include premium payments by employers on behalf of households. Since the fraction of premiums paid by households has been quite stable over the past two decades (Kaiser Family Foundation, 1999, 2008), we do not expect this difference to bias our results.
same group that has seen a substantial shift from private to public coverage—median household spending on health has actually declined significantly. Additional analysis of the data reveals a significant decline in the share of this group that has any household health spending, from 78 percent in 1980 to 61 percent in 2007. That is, by 2007, almost 40 percent of households with children and lower education levels spent nothing on health (recall that this does not include any payments made on their behalf by governments or employers). Since having no household spending is much more likely for households with public insurance, the decline in the median household health spending is consistent with the large shift to public insurance observed for this group.

Interestingly, however, the expansion of public coverage in this group did not reduce the 90th percentile of the distribution as well; a priori, we might have expected a net shift from private coverage or no coverage to public insurance to reduce both the median and the 90th percentile of the distribution, with a larger effect at the 90th percentile. But this is not what we observe in the data. This striking finding suggests that public insurance expansions did not shave off the highest tail of expenditures (although there may very well be very different individuals at the 90th percentile over time). This likely reflects the fact, shown in Figures 4 and 5, that this group with lower education and socioeconomic status saw both the

Figure 6
Health Spending as a Share of Household Budgets, All Nonelderly

Source: Consumer Expenditure Survey, interview component.
Note: The 90/50 gap is the ratio of the 90th to the 50th percentile.
greatest expansion of public insurance and the greatest rise in uninsurance (among adults). Thus risk—defined as the 90/50 gap—increased for this group.

Health Spending Risk and the Elderly

The medical spending risks facing the elderly are very different from those facing the under-65 population, primarily because of near-universal coverage by Medicare for those ages 65 and older. As a result, the risks the elderly face are those associated with expenses not covered by Medicare. This means primarily long-term care expenses and the sizeable cost-sharing for acute care services that Medicare imposes on beneficiaries. We discuss each of these in turn, beginning with acute care.

Medicare requires substantial cost-sharing from most beneficiaries, including a 20 percent coinsurance for physician services with no cap on the amount owed by the beneficiary and a $1,068 (as of 2009) deductible for each hospital stay. Most of

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### Table 1
(for nonelderly households by education and the presence of children)

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Source: Consumer Expenditure Survey, Interview Component.

Note: Health spending in these data includes household payments for out-of-pocket medical care plus the household’s share of health insurance premiums. “High education” households are those in which the reference person has at least some college education. “Low education” households are those in which the reference person has a high school education or less. The “90/50 gap” is the ratio of the 90th percentile of spending to the median.
the elderly respond to the risk of these out-of-pocket costs by obtaining supplemental insurance, either through their former employers, in the market for individual “Medigap” policies, or through the state in the form of Medicaid, which pays Medicare premiums and cost-sharing for low-income elderly. Some Medicare beneficiaries also choose Medicare Advantage plans (formerly known as Medicare+Choice and commonly referred to as Medicare health maintenance organizations), which typically impose lower cost-sharing on enrollees than traditional Medicare. Goldman and Zissimopoulos (2003) document that the elderly who have no supplemental coverage have much higher out-of-pocket spending than do those with any of these types of supplemental coverage. Data from the March Current Population Survey, presented in Table 2, show that the fraction of the elderly who have supplemental coverage has been declining for the past two decades, and that this decline is entirely driven by a decline in Medigap coverage.10

Table 2
Health Insurance Coverage Among the Elderly

<table>
<thead>
<tr>
<th>Fraction with</th>
<th>Medicare plus group coverage</th>
<th>Medicare plus Medigap</th>
<th>Medicare plus Medicaid</th>
<th>Medicare only</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>0.312</td>
<td>0.372</td>
<td>0.067</td>
<td>0.249</td>
</tr>
<tr>
<td>1989</td>
<td>0.314</td>
<td>0.364</td>
<td>0.071</td>
<td>0.252</td>
</tr>
<tr>
<td>1990</td>
<td>0.328</td>
<td>0.356</td>
<td>0.069</td>
<td>0.248</td>
</tr>
<tr>
<td>1991</td>
<td>0.326</td>
<td>0.352</td>
<td>0.078</td>
<td>0.245</td>
</tr>
<tr>
<td>1992</td>
<td>0.323</td>
<td>0.354</td>
<td>0.080</td>
<td>0.244</td>
</tr>
<tr>
<td>1993</td>
<td>0.314</td>
<td>0.346</td>
<td>0.069</td>
<td>0.271</td>
</tr>
<tr>
<td>1994</td>
<td>0.342</td>
<td>0.338</td>
<td>0.069</td>
<td>0.251</td>
</tr>
<tr>
<td>1995</td>
<td>0.343</td>
<td>0.345</td>
<td>0.065</td>
<td>0.248</td>
</tr>
<tr>
<td>1996</td>
<td>0.335</td>
<td>0.331</td>
<td>0.072</td>
<td>0.263</td>
</tr>
<tr>
<td>1997</td>
<td>0.333</td>
<td>0.312</td>
<td>0.069</td>
<td>0.287</td>
</tr>
<tr>
<td>1998</td>
<td>0.334</td>
<td>0.289</td>
<td>0.068</td>
<td>0.309</td>
</tr>
<tr>
<td>1999</td>
<td>0.335</td>
<td>0.280</td>
<td>0.071</td>
<td>0.314</td>
</tr>
<tr>
<td>2000</td>
<td>0.329</td>
<td>0.286</td>
<td>0.077</td>
<td>0.307</td>
</tr>
<tr>
<td>2001</td>
<td>0.337</td>
<td>0.278</td>
<td>0.075</td>
<td>0.311</td>
</tr>
<tr>
<td>2002</td>
<td>0.330</td>
<td>0.274</td>
<td>0.079</td>
<td>0.317</td>
</tr>
<tr>
<td>2003</td>
<td>0.346</td>
<td>0.265</td>
<td>0.071</td>
<td>0.318</td>
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<tr>
<td>2004</td>
<td>0.348</td>
<td>0.258</td>
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<tr>
<td>2005</td>
<td>0.357</td>
<td>0.247</td>
<td>0.072</td>
<td>0.324</td>
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<tr>
<td>2006</td>
<td>0.355</td>
<td>0.253</td>
<td>0.071</td>
<td>0.321</td>
</tr>
<tr>
<td>2007</td>
<td>0.334</td>
<td>0.243</td>
<td>0.070</td>
<td>0.354</td>
</tr>
</tbody>
</table>


10The Current Population Survey data do not include whether Medicare enrollees are covered by Medicare health maintenance organizations; to the extent that individuals whom we classify as having “Medicare only” in the Current Population Survey actually have Medicare health maintenance organization coverage (which has been available in one form or another since 1985), our estimates overstate the increase in the fraction with no supplemental coverage since 1988. As of 2007, 19 percent of
Figure 7
Health Spending as a Share of Household Budgets, All Elderly

![Figure 7](image)

Source: Consumer Expenditure Survey, interview component.
Note: The 90/50 gap is the ratio of the 90th to the 50th percentile.

Figure 7 shows descriptive statistics on the distribution of household spending for the elderly as a group (including both out-of-pocket medical care and the household’s share of any insurance premiums). Clearly, the elderly spend much more than the nonelderly; median health spending for elderly households is about 12 percent of their budgets, which is the 90th percentile of the spending distribution for the nonelderly. The distribution is also much more compressed than for the nonelderly; the 90th percentile is only about 2.5 times the median for the elderly, compared to a ratio of about 5 for the nonelderly. In terms of what is happening to risk over time, as was the case for the nonelderly population, the entire health spending distribution has shifted up significantly over time, but the ratio of the 90th percentile to the median has declined somewhat.

Prescription drug spending is one area where we might expect to see declines in risk for the elderly in recent years. Prior to the introduction of Medicare Part D, Medicare beneficiaries were enrolled in Medicare Advantage plans (Kaiser Family Foundation, 2007); our tabulations using the 2006 Health and Retirement Study show that the majority of those would be individuals with no other supplementary insurance.

11 This difference is driven entirely by higher health spending per person, rather than lower total budgets per person, among elderly households.
24 percent of the elderly had no drug coverage (Levy and Weir, 2009), and our
calculations using data from the Consumer Expenditure Survey suggest that pre-
scriptions drugs were responsible for about one-quarter of total household health
spending for the elderly. Following the introduction of Part D, the fraction of the
elderly with no drug coverage declined to only 7 percent (Levy and Weir, 2009).
Figure 8 shows that real out-of-pocket drug spending among the elderly declined
significantly following the introduction of Part D, particularly in the upper tail of
the spending distribution. Using data from the Consumer Expenditure Survey, the
figure shows that the 90th percentile of the distribution of out-of-pocket drug
spending, which began a slow decline in 2001, declined sharply in 2006 and 2007
following the implementation of the Medicare prescription drug benefit; there is
no corresponding change in median out-of-pocket drug spending for the elderly
over time.12

The Consumer Expenditure Survey data also show a decline between 2005 and 2006 at the 90th
percentile for the near-elderly (ages 55–64), but it is much smaller than the decline for the elderly and
does not persist in 2007.

12 The Consumer Expenditure Survey data also show a decline between 2005 and 2006 at the 90th
percentile for the near-elderly (ages 55–64), but it is much smaller than the decline for the elderly and
does not persist in 2007.
Long-term care spending, on the other hand, remains a significant source of risk facing the elderly. About two-thirds of long-term care spending is on nursing homes and similar long-term care facilities, and the remainder on home care (National Health Expenditure Accounts, 2007). The cost of long-term care can be quite high, with nursing home costs averaging over $60,000 per year (Gruber, 2006). Public insurance programs for long-term care have complicated risk-bearing properties. As already noted, Medicare provides very limited coverage for short-term care in a skilled nursing facility following a hospital stay. Medicaid, on the other hand, covers nursing home costs once individuals “spend down” their assets and exhaust their personal savings. In this sense, Medicaid imposes an implicit tax on assets: Medicaid will only provide financing once assets are low, so having a lot of assets implies forgoing the right to a government-financed nursing home stay. Nonetheless, the government now pays for the majority of long-term care. The result is that even as long-term care spending has more than doubled as a share of U.S. health spending, from 3 percent in 1960 to more than 7 percent in 2007, most of this increase has been borne by the public sector. Figure 9 shows the increase over time in real long-term care spending per capita for the private versus the public sector. As of 2007, per capita private spending on long-term care is at about its 1990 level, while public spending has doubled.

The private market for long-term care insurance has grown rapidly in the past decade, but remains small, paying for nursing home costs for only about 8 percent of patients. Private individual insurance may never work especially well for long-term care. The costs of long-term care in the future are subject to considerable uncertainty in both real and nominal terms, which makes it hard to set prices and thus leads to caps on benefits that can discourage potential customers.
the individual private market for long-term care insurance faces severe problems of adverse selection based on private information—not only about health, but also about ability to live independently and the strength of family and community ties that might provide support for independent living. People have much better knowledge about the likelihood of extended nursing home stays than insurance firms can ever have. Thus, insurance firms setting prices for long-term care coverage face the standard dilemma: setting the price low will attract many customers—from relatively likely to relatively unlikely to need long term care—but may not cover average costs. Setting the price high, on the other hand, will only attract those who know they need care, and thus may also not be a viable strategy. In general, the firm faces the dilemma of setting a price that is low enough so the relatively healthy will buy to hedge risk, but high enough that claimants’ costs are covered. Such a price may not exist, particularly when insurers compete with one another to skim off low-risk customers.

How Much Medical Spending Risk Should Households Face?

We have focused so far on how the risk of health spending facing households has changed over time, sidestepping the question of whether at any given point in time households face too much or too little risk from a theoretical perspective. Although protecting households from risk sounds like a worthy goal, a considerable body of theory suggests that the optimal level of medical spending risk is not zero. The uncertainty of medical spending gives rise to the demand for health insurance (Arrow, 1963); at the same time, the presence of moral hazard implies that full insurance is not optimal and consumers should remain liable for some spending through deductibles and/or coinsurance (Pauly, 1968). Exactly how much risk consumers should face in order to achieve an efficient outcome depends on both the price elasticity of demand for medical care and on the quality of their information about the effectiveness of different medical treatments (Chernew, Rosen, and Fendrick, 2007; Pauly and Blavin, 2008). In the real world, determining the optimal level of coinsurance is further complicated by the significant tax subsidy to employment-related health insurance, in which health insurance premiums paid by employers are not taxed as income to employees, an arrangement which very likely results in coinsurance rates that are suboptimally low for many people—that is, they face too little risk from an efficiency perspective (Feldstein, 1973; Feldstein and Friedman, 1977).

Balancing this longstanding concern that the tax subsidy leads some households to have too much insurance is the notion that some of the insured are “underinsured” (recent work in this area includes Schoen, Doty, Collins, and Holmgren, 2005; Banthin and Bernard, 2006; Blewett, Ward, and Beebe, 2006; Merlis, Gould, and Mahato, 2006; Ward, 2006). Empirical analyses of underinsurance typically define the underinsured as households with spending on out-of-pocket medical care and health insurance premiums that is high relative to
income—for example, greater than 10 percent.\textsuperscript{13} This definition does not correspond well to economic notions of optimal insurance; expenses that are high but predictable may constitute a financial burden, but do not represent economic risk. Moreover, it leads to some counterintuitive results; for example, our calculations using the Consumer Expenditure Survey suggest that this definition would classify less than 5 percent of the uninsured and more than half of the elderly as underinsured. It may be more accurate to characterize these families as facing a high burden of health spending rather than to say that they are underinsured.

A purely economic approach to the adequacy of insurance would consider whether households are able to smooth consumption in response to health shocks (for more discussion of this point, see Townsend, 1995). Unfortunately, the empirical literature has very little conclusive to say on this topic, at least using U.S. data. Gertler and Gruber (2002) and Mohanan (2008), using data from Indonesia and India respectively, find evidence of imperfect consumption smoothing in response to health shocks, suggesting too much exposure to risk. Levy (2002), the only paper to address this question using U.S. data, fails to reject the null hypothesis that consumption of the near-elderly is smooth in response to health shocks, although the large standard errors on the estimates do not rule out economically meaningful effects of shocks on consumption.

A much larger literature has estimated the effect of poor health on measures of wealth or economic security (in addition to the studies cited above of health and bankruptcy, these include Smith, 1999; Gertler and Gruber, 2002; Levy, 2002; Wu, 2005; Adams, Hurd, McFadden, Merrill, and Ribeiroa, 2003; Lee and Kim, 2003; Kim and Lee, 2005; Lyons and Yilmazer, 2005; Smith, 2005; Kim and Lyons, 2008; Michaud and Van Soest, 2008; Mohanan, 2008; Cook, Dranove, and Sfekas, 2009). In general, these studies find that poor health means lower wealth, but this literature has some limitations. As noted above, these studies do not all distinguish between the effect of poor health on medical spending and its effect on labor income. Nor do all these studies estimate effects separately for households with and without insurance. Finally, with the exception of Lyons and Yilmazer (2005), all of these studies focus only on the elderly and/or near-elderly. Nonetheless, these studies do collectively support the common-sense notion that poor health threatens household assets, which is consistent with the idea that at least some households face too much risk. No studies have addressed the question of whether any negative effect of poor health on wealth has changed over time.

**Conclusion**

Our bottom line is that health spending risk facing a typical household has not increased much, if it all, since 1980. It seems difficult to reconcile this with

\textsuperscript{13} Since the share of GDP devoted to health care in the aggregate is 16 percent, an accurate accounting of the incidence of all health care costs—including those financed by taxes and nominally paid for by government—must have the average individual spending be 16 percent of income on health care.
increasing public concern about the financial threat posed by high medical bills. Is this concern overblown? Or to pose the question in a way that is likely to be more useful for current policy debates: What do our results have to say about the rationale for further government intervention to expand health insurance coverage? We offer six observations along these lines.

First, our proxies for risk are imperfect along two important dimensions. We are measuring cross-sectional risk and not the theoretically appropriate measure of within-household risk over time. Moreover, purposeful decisions by households at greatest risk to limit their health spending (for example, doing without medical care that doctors would deem necessary) would appear as reduced risk given that we measure risk by spending that actually occurred.

Second, our paper has focused on the trends in risk over time—but we have had little to say on whether the levels of risk are appropriate. Household health spending exhibits huge dispersion and many individuals are facing spending risk that is large relative to their incomes. The amount of risk-bearing being asked of households over time has not increased over the time period considered in this paper, but that does not mean that the level has not remained too high over this period.

Third, important heterogeneity exists in the risk facing households from health spending. For the majority of households with private or public health insurance, the risk of health spending has risen little over the past several decades. But for others, risk has increased—in particular adults with low socioeconomic status whose rates of uninsurance have increased over this period. This is also the group for which our measure of risk using health spending may be most misleading because it is perhaps the group most likely to experience self-imposed limitations on medical care consumption.

Fourth, many of the implicit health insurance mechanisms—which are likely to be partially responsible for the fact that we have not seen more of an increase in risk over time—may be suboptimal as a matter of public policy. The provision of charity care by hospitals seems to be a particularly good example of this; so is the fact that the bankruptcy code is now a de facto part of our system of financing health care. Coate (1995) shows that in-kind transfers of insurance to the poor are more efficient than private charity under fairly general conditions. In the current context, mandating health insurance and providing premium subsidies to the poor would be more efficient than the current patchwork of implicit insurance mechanisms.

Fifth, we return to the theme that much of the public policy concern in this context is motivated by concerns over burden-sharing and not risk-bearing. Many public policies are not about reducing risk or smoothing consumption, but are about redistributing resources or providing a floor on consumption, or some combination of these goals. Indeed, when Harry Truman in a 1945 message to Congress identified five arguments in favor of national health insurance, reduction of medical spending risk was only the fourth of these—after improved access to medical services, better maternal and child health, and the need for more medical research (the fifth argument was lost income due to disability).
Finally, our results suggest the real problem facing the health insurance system in the United States is not so much the risk of high spending by individual households as the systemwide risk of increasing aggregate spending. Much of the public discussion about health insurance reform focuses on inadequate coverage, but uninsurance is not obviously worse than it once was, and public policy has stepped in to fill important gaps (for example, through programs like Medicare Part D and SCHIP). Supposing for a moment that this level of household risk were deemed acceptable—or that we had solved this part of the problem by extending insurance coverage to all households—we would still have to address the unsustainable trend shown in Figure 1, in which health costs consume an ever-growing share of GDP, at least some of which reflects an inefficient allocation of resources (Garber and Skinner, 2008). The fact that the real problem is systemic risk rather than individual risk may explain a paradox of the current health debate: while everyone claims to believe that the health care system is broken, a large chunk of citizens seem none too excited about fixing it. Addressing systemic risk is largely a public good, like paying down the national debt or financing the military. We all agree it should be done, but no individual has an incentive to be part of the solution.

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References


Chernew, Michael E., Allison Rosen, A. Mark...


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1. Thomas G. McGuire. Demand for Health Insurance 2, 317-396. [CrossRef]