ELSEVIER

How much uncompensated care do doctors provide?

Jonathan Gruber[*], David Rodriguez

*Massachusetts Institute of Technology (MIT), Department of Economics,
50 Memorial Drive, E52-355, Cambridge, MA 02142, United States*

Abstract

The magnitude of provider uncompensated care has become an important public policy issue. Yet existing measures of uncompensated care are flawed because they compare uninsured payments to list prices, not to the prices actually paid by the insured. We address this issue using a novel source of data from a vendor that processes financial data for almost 4000 physicians. We measure uncompensated care as the net amount that physicians lose by lower *payments* from the uninsured than from the insured. Our best estimate is that physicians provide *negative* uncompensated care to the uninsured, earning more on uninsured patients than on insured patients with comparable treatments. Even our most conservative estimates suggest that uncompensated care amounts to only 0.8% of revenues, or at most $3.2 billion nationally. These results highlight the important distinction between charges and payments, and point to the need for a re-definition of uncompensated care in the health sector going forward.
© 2007 Elsevier B.V. All rights reserved.

JEL classification: i1

Keyword: Uncompensated care

The high and rising number of uninsured in the United States has led to increased concern about their access to health care. For many uninsured, the primary means of access is through uncompensated care from medical providers: care for which the uninsured are not billed, or which they receive at a substantial discount. The existence and magnitude of uncompensated care has become an important public policy issue.

For example, attempts to use provider assessments to finance care for the insured (as recently enacted in the state of Massachusetts and debated in the state of California) are justified by the

* Tel.: +1 617 253 8892; fax: +1 617 253 1330.
  E-mail address: gruberj@mit.edu (J. Gruber).

savings to providers from their reduced costs of caring for the uninsured. In this era of tight fiscal budget constraints at both the state and federal level, assessing the amount of funds that are potentially available from uncompensated care to finance broader health reform is critical.

Previous studies have used different approaches to calculating the amount of uncompensated care. In 2006, the American Hospital Association (AHA) collected data from hospitals on the amount by which payments fell short of the costs of providing care. The AHA calculates that hospitals provided uncompensated care in 2005 equivalent to 5.6% of their costs for that year, or $28.8 billion dollars. Cunningham and May (2006) collected data on physician uncompensated care by surveying physicians and asking them what share of their time was spent on charity care. They estimate that 68% of physicians provided charity care in 2004–2005, a significant decline from just 8 years earlier, and that doctors spent on average 6.3% of their time on charity cases. Combining these two studies suggests that there may be over $50 billion/year in uncompensated care provided in the U.S.

The goal of our paper is to measure the cost to one part of the health care system, the office-based physician sector, of caring for the uninsured population. In contrast to previous studies, we do not compare payments by the uninsured to the prices that they are billed, but rather to the prices actually *paid* by insured patients. That is, we ask: compared to insured patients, how much less do uninsured patients pay for their care? The difference between what the insured pay and the uninsured pay is our definition of uncompensated care.

Our approach differs from previous studies in two key ways. First, most studies determine the value of uncompensated care by looking at doctors' list prices. But since doctors negotiate deeply discounted rates with insurance companies (averaging 55% in our data), using list prices will overestimate the true amount of uncompensated care. Instead, we use data that allow us to determine what doctors actually receive on average for each procedure they do. For example, if an uninsured patient receives a procedure with a list price of $200, but insurance companies would only pay that doctor $90 on average, we say that patient received $90 worth of care. If the patient paid nothing, we call that $90 of uncompensated care.

A second difference in our approach is that we allow uncompensated care to be negative. If an uninsured patient pays $200 for a procedure for which an insurance company would pay that doctor $90, then we say that patient received −$110 of uncompensated care. This reflects the fact that a large fraction of the uninsured pay full list price (which is typically much greater than what an insured patient would pay), and a second large fraction of the population pay nothing. The total effect on a single doctor or the industry as a whole can be judged only by combining the effect of both groups.

Whether negative uncompensated care should be counted as an offset to positive uncompensated care depends on the goal of the exercise. One goal is to assess the aggregate amount of uncompensated care provided by physicians, which is used as an important yardstick by public policy makers. Our approach is consistent with this goal. Another goal would be to assess the share of physicians providing charity care, or the share of patients receiving such charity care. In this case, one might not want to use "negative" uncompensated care to offset positive charity care. We show alternative results below which address this perspective, and find that uncompensated care in the physician sector is still well below common estimates.

To estimate uncompensated care, we make use of a new data set that includes detailed financial records for nearly 4000 doctors and over 4 million patient visits, including 160 k visits from uninsured patients. For every visit, we know: the patient's insurance coverage, the procedures done, the diagnoses justifying those procedures, the price charged, and how much the patient and insurance company paid against each charge.

Our approach to uncompensated care gives results that are consistent with other studies when the same measurement approaches are used, yet dramatically different when our alternative measurement approach is used. Using our data, we estimate uncompensated care relative to *list* prices of 2.7–3.2% of physician revenues.

However, we believe this estimate of uncompensated care is wrong because it's based on list prices. If we instead look at the discounted rates which determine what doctors are actually paid, we get a very different picture. While about a quarter of visits by the uninsured result in no payment, almost two-thirds of uninsured patients pay more for their care than insured patient, and often much more. And we find that the majority of physicians actually *make money*, on net, on their uninsured patients. On net, our best estimate of uncompensated care is −0.07%. That is, the average doctor earns slightly more on their uninsured patients than their insured patients. A more conservative estimate places uncompensated care at only about 0.8% of revenues, well below reported levels.

Our paper proceeds as follows. In Part I, we provide a brief background discussion on charity care in health care. Part II discusses our unique source of data and how we will use it to measure uncompensated care. Part III presents our results, while Part IV considers a host of potential biases to our findings and largely dismisses them. Part V concludes.

1. Part I: Background on charity in the health care sector

1.1. Hospital charitable care

Charitable care has long been a stated mission of hospitals. When the Hill-Burton Act was passed in 1946, non-profit hospitals were given federal funding in exchange for providing a "reasonable volume of services to persons unable to pay." The term "reasonable volume" was left unclear until 1979, when the minimum was defined as 3% of the hospital's expenses or 1/10th of the assistance provided by the federal government. Funding is no longer distributed under Hill-Burton, but any hospital that claims tax-exempt status must document how it is providing a service to the community beyond what a profit-seeking business would provide. Again there are few hard requirements, and hospitals are free to draw on everything from free care to the health brochures they hand out in waiting rooms.

The AHA performs a survey each year to calculate how much free and discounted care hospitals provide, and their data suggests hospitals have been providing a level of free or discounted care equal to 5–6% of revenue for the last 25 years. This number includes two groups of patients: (1) those who were given free or discounted care because the hospital determined they were unable to pay, and (2) patients who had the ability to pay, as determined by the hospital, but didn't pay (commonly called "bad debt"). When non-profit hospitals report their level of uncompensated care to government agencies, it's common for them to also combine the two types of patients.

There is debate over whether hospitals should be allowed to include bad debt when calculating their level of charity care because there is substantial difference between offering a patient free care from the start and declaring care to be free only after the hospital (and collection agencies) have been unable to collect payment. Organizations like the Catholic Health Alliance argue that bad debt should be excluded when calculating charity care (Catholic Health Association, 2005), and they've held meetings with the IRS to argue for revised guidelines. The IRS appears to be moving in that direction. Steven T. Miller, The IRS' commissioner of the IRS' Tax Exempt and Government Entities Division, recently said "It's hard to see bad debt as charity care where collection actions

or threats have been brought to bear in the area" (Healthcare Financial Management, 2007). The IRS expects to release revised guidelines later in 2007.

Several states have enacted laws which define a minimum level of charity care that non-profit hospitals must provide in order to retain their tax-exempt status. In Texas, for example, hospitals must document that they're providing charity care equal to 4% of the hospital's patient revenue, excluding bad debt (Texas Department of State Health Services, 2005).

The other major consideration with these data is that they measure uncompensated care delivered to all patients, not just the uninsured. Yet expansion of insurance coverage is typically motivated by the uncompensated care savings that will derive from covering the uninsured; indeed, when insurance coverage expands, uncompensated care to the insured can only increase. We are aware of only three studies that attempt to separate the share of uncompensated care provided to insured versus uninsured patients, for samples of patients in Florida, Massachusetts and Indiana.

The results of these studies are fairly consistent: the share of uncompensated care cases that are accounted for by the uninsured varies from 35% (Duncan and Kilpatrick, 1987; Weissman et al., 1992) to 46% (Saywell et al., 1989), and the share of uncompensated care dollars that are accounted for by the uninsured varies from 60% (Saywell et al., 1989; Weissman et al., 1992) to 72% (Duncan and Kilpatrick, 1987).

1.2. Physician charitable care

There is much less work on charitable care by physicians. The earliest work of which we are aware is Sloan et al. (1978), using a 1977 nationwide survey of physicians, who found that charity care amounted to 2.7% of gross billings and that bad debts accounted for an additional 8.4% of gross billings. Ohsfeldt (1985) used data from the American Medical Association's Socioeconomic Monitoring System from 1982 and found that physician billings were reduced by 9% by charity care and another 6.3% for bad debt. Kilpatrick et al. (1991) drew a random sample of physicians in the state of Florida and found that 10.4% of the billed amount by physicians was unresolved, with roughly half of that amount coming from self-pay patients. Kilpatrick et al. is the only study which separated out physician uncompensated care to insured versus uninsured patients; they find that 31% of uncompensated care cases, representing 52% of uncompensated care amounts, were accounted for by the uninsured.

The best known recent work in this area is continuing analysis of the Community Tracking Survey (CTS) by Peter Cunningham and associates. The CTS is a nationally representative telephone survey of physicians involved in direct care in the continental U.S. This survey asks physicians about the share of patients who receive free or reduced price care due to financial need (but without distinguishing insured versus uninsured), and the percentage of practice time spent providing such care. The most recent round of this study (2004–2005) found that 68.2% of physicians provide such "charity care", and that, among physicians providing such care, it amounts to 6.3% of their time.

2. Part II: Data and methodology

The centerpiece of our analysis is a unique data set the likes of which has never been explored to investigate the charitable care issue. The vendor provides medical billing services to doctors across the country, and has detailed financial records for 3860 physicians in 317 practices in 60 different specialities. The data come from physicians at small and large groups, including clinics,

academic medical centers, and hospitals. Both for-profit and non-profit groups are included; one quarter of the providers come from hospitals or academic medical centers.

These records have been made available to us with permission from the vendor and its physician clients. Altogether we have data for 4.4 million visits from 1.8 million patients that occurred between 9/1/2004 and 3/1/2005. Of those visits, 162,000 were from uninsured patients. For each patient visit, the dataset includes: the procedures performed, the diagnoses justifying those procedures, and the financial details associated with each procedure done: payments received, discounts given, and amounts written off or sent to collection agencies. The dataset includes the patient's insurance information, including broad categories: medicare, medicaid, private insurance, or uninsured.

We determine the patient's coverage by looking at the insurance coverage associated with the claim. A patient is considered "uninsured" if the claim for that service was never submitted to an insurance company. It's possible that some of our "uninsured" patients indeed have some form of insurance coverage, but appear uninsured in our data because they're either seeing a doctor that's not covered by the insurance or they're receiving a procedure for which they're not covered. Therefore, our definition of "uninsured" only applies to that visit. In Part IV, we perform a variety of tests to exclude patients who might be considered uninsured only because they're seeking services not covered by insurance.

One potential concern with this analysis is that the ultimate insurance coverage of the patient does not correspond to the insurance status recorded when the patient checked in. In our data, 3% of visits are from patients who are recorded as uninsured at time of check in. There are an additional 0.71% of visits from patients who are recorded as insured, but who turn out to be uninsured, typically because coverage had expired. There is a very small set of individuals for which the opposite is true (appear uninsured but are actually insured).

A patient that checks in as an uninsured patient has the potential of being treated differently (or might ask to be treated differently) than a patient with insurance. Since our goal is to compare insured patients to uninsured patients, both in level of treatment and the prices charged, we calculated results for two sets of patients: (1) uninsured patients who appeared uninsured when they checked in, and (2) all uninsured patients. The results for both sets are similar, so we simply report the results for case (1).

Of the nearly 4000 doctors in the sample, we excluded every doctor that had less than 200 patient visits or $25,000 in revenue over the 6 month period. This restriction drops the number of physicians in our sample from 3860 to 2537, but reduces the number of patient visits only slightly, from 4.42 to 4.36 million. Next we excluded every physician without at least one visit from an uninsured patient where we could determine the visit's expected payment (defined below), which reduces the number of uninsured visits from 162 to 149 k and the number of physicians to 2474.

2.1. Sampling

Our sample is not random, but is rather selected by which practices choose to use the services of this particular vendor. To make our providers look more like the national population of doctors, we determined a weighting for each provider based on location, speciality, and practice size. Unfortunately, we could not find a single data set that provided the joint distribution of physicians along these three dimensions, so we combined data from two sources: published tabulations of the American Medical Association (AMA) physician survey (on physician location), and our own tabulations of the physician component of the Community Tracking Survey (CTS) (on a cross-tabulation of physician speciality and practice size).

Table 1
Weighting factors

Size or speciality	% in sample	% nationally	Scaling factor
Speciality: family/general practice	18.58	16.99	.91
Speciality: internal medicine	14.71	14.27	.97
Speciality: medical specialities	23.82	29.34	1.23
Speciality: ObGyn	14.50	6.25	.43
Speciality: pediatrics	10.61	7.83	.74
Speciality: psychiatry	1.87	6.47	3.46
Speciality: surgical specialities	15.90	18.84	1.19
Practice size: 1	1.87	23.75	12.71
Practice size: 2–3	4.82	16.45	3.42
Practice size: 4–10	11.77	23.97	2.04
Practice size: 11–199	54.22	14.84	.27
Practice size: 200+	5.42	3.75	.69
Practice size: other	21.90	17.23	.79

Note: Table shows the relative national and sample-specific distribution of practice characteristics that are used to develop our scaling factors. First column shows the percentage in the sample represented by that speciality or size. The second column shows the comparable figure for the national sample (from CTS, as described in text). Third column is the ratio, which we use to scale the data.

We began by using these data to investigate the representativeness of our sample. Our sample is restricted to only 22 states, although they span all regions of the nation; the data are relatively oversampled in the states of Massachusetts, Kansas and Ohio.[1] As Table 1 shows, our sample is much more likely to consist of large physician practices than is the national sample in the CTS survey. Only 2% of our sample consists of solo practitioners, as opposed to 21% of the CTS survey; only 5% of our sample is in practices of two to three physicians, as opposed to 16% in the CTS survey; and only 11% of our sample is in practices of 4–10 physicians, as opposed to 23% in the CTS survey. In contrast, two-thirds of our sample is in practices of eleven or more physicians, as opposed to only 21% in the CTS survey. The distribution of specialities in our data is much closer to that in the CTS; we somewhat understate medical specialists and overstate obstetricians/gynecologists, but the numbers are otherwise very comparable.

To weight for these differences, we (a) computed the share of our physicians in each state relative to the AMA data and (b) computed the share of our physicians in each size/speciality, relative to the CTS data, (c) multiplied these shares for any given physician, and (d) used the inverse as a weight. So, for example, 6% of our sample physicians are in California, while the AMA reports that 12% of physicians are in that state nationally. And only 1.3% of our sample is family/general practitioners in practices of size 4–10, while 3.9% of the national CTS sample is in this cell. So, any family/general practitioner in a practice of size 4–10 in California receives a weight of the inverse of (6/12) × (1.3/3.9), or a weight of 6 in this case.

This weighting procedure has two weaknesses. First, we do not account for any covariance between size/speciality and location; for example, if the state of California happens to have a particularly high share of family/general practitioners in a practice size of 4–10, that would lead us to overweight that observation. Second, our sample may differ from the national sample along

---

[1] The states are: California, Connecticut, Florida, Georgia, Illinois, Kansas, Louisiana, Massachusetts, Maryland, Michigan, Missouri, North Carolina, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas and Virginia.

dimensions other than size, location and speciality. We have no reason to believe that either of these is a problem in practice. Nevertheless, we will show our findings both weighted and unweighted to illustrate the importance of this weighting procedure.

We compared the patients in our sample against those in the National Ambulatory Medical Care Survey (NAMCS), the largest nationally representative data set of physician visits. This distribution is similar, particularly once our data are weighted. The NAMCS finds that 60.5% of visits are from patients with private insurance; in our data, once weighted, it was 59%. For medicare, NAMCS finds 26.2% while we find 23%. For medicaid, NAMCS has 10% while our data has 9.3%. Finally, 3.9% of our visits are from the (ex-ante known) uninsured, compared to 4.8% of visits nationally. There is an additional 1.6% of visits in our data that come from patients who are not known to be uninsured at the time of service but who end up being uninsured for that procedure. It is unclear how these should be distributed across payers. Nonetheless, the close correspondence of these categories suggests that our sample is fairly nationally representative.

It is important to highlight that both our sample and the NAMCS sample to which we compare our data consider only physician offices and *not* hospital outpatient clinics which provide a disproportionate share of outpatient uncompensated care. Yet this is appropriate for our analysis since our paper focuses on the amount of physician uncompensated care delivered in the U.S., not on hospital uncompensated care (which would include outpatient clinics). As we discuss in the conclusion, our findings for physicians do not necessarily extend to the hospital setting, so that the figures from the AHA for uncompensated care in that sector are more close to reliable. But given the large amount of uncompensated physician office care that is implied by surveys, such as Cunningham's it is important to consider the physician sector as well.

2.2. Methodology

Our definition of uncompensated care implicitly asks the question: if each provider could replace each uninsured patient with an insured patient who received the same level of care, would the provider expect to make more or less? If the uninsured patient paid the same amount the average insurance company would pay (to the same doctor, for the same procedure), then we say there is no uncompensated care. Since we look only at payments instead of prices, we completely sidestep the problems associated with inflated list prices.

To calculate uncompensated care, each visit is broken down into the procedures done, and for each procedure we calculate the average payment that doctor would expect to receive from doing that procedure on an insured patient; this is the procedure's "expected payment". For every uninsured visit, we sum the expected payments and subtract the actual payments; this is our "uncompensated care".

A unique expected payment is calculated for every doctor/procedure code combination by looking at each doctor's payment history. If a doctor performed a procedure less than five times, we use the payment history for that procedure for all doctors at the practice. If there are still fewer than five observations available, the procedure is excluded for that doctor, and every visit with that procedure code is excluded.[2]

One hole in our data is around charges sent to collection agencies: we know how much was sent off to collection agencies for visit, but we don't know how much was ultimately recovered

---

[2] We can compute expected payments for 95% of the procedures performed on the uninsured in our data. Among that group, we compute expected payment using the same physician 93% of the time, and using the practice overall 7% of the time.

and returned to the doctor. This is a large issue since the uninsured have a large number of charges sent to collection agencies; in our data, uninsured patients collectively paid $7.8 million directly to the practice, but another $8.7 million in charges were sent to collection agencies.

Good data on collection rates are hard to find, but a few sources suggest physicians recovery only a small fraction of the charges they send to collections, around 10%.[3] To assess the sensitivity of our results to collection rates, we calculate all numbers under two different assumptions: (1) no charges sent to collections are recovered, and (2) 10% of charges sent to collections are recovered.

In summary, our approach uses insured patients as a measure of the opportunity cost of serving an uninsured patient. In doing so we implicitly assume that physicians can freely substitute an insured patient for an uninsured patient; that is, that the supply of insured patients is perfectly elastic at the point that the uninsured patient is treated. This may not be a reasonable assumption. Indeed, there is evidence that physicians are less willing to take uninsured patients than privately insured patients, which suggests that they don't consider uninsured patients valid alternatives (and therefore may be turning to them only when privately insured patients run out).[4]

If this is true, then estimates using privately insured rates as the opportunity cost of the uninsured potentially overstate uncompensated care (by overstating the opportunity cost of seeing the uninsured patient). We can bound this problem, however, by using medicaid payments as a measure of opportunity cost. These same studies show that physicians are more willing to see uninsured patients than medicaid patients; at least with uninsured patients, there is some prospect of high reimbursement, while medicaid reimbursement is low both ex-ante and ex-post. Therefore, medicaid payments probably understate the opportunity cost of taking the uninsured (since the uninsured are still preferred to medicaid). As a result, we present our basic results compared to all insured patients, but then split into comparisons to the privately and medicaid insured to bound our measure of opportunity cost.

3. Part III: Basic results

We present our results from two perspectives: the physician's and the patient's.

3.1. Physician perspective

Fig. 1 shows the distribution of uncompensated care relative to expected payment on average for uninsured patients for each physician. To provide bounds on our estimates, we consider two extreme cases. The first, our "Base Definition" which in our view most accurately represents the amount of uncompensated care in our data, assumes that 10% of charges sent to collection agencies are ultimately collected, and weights the data using the procedure described above. The alternative "Conservative Definition" both (a) assumes that zero percent of charges sent to collections agencies are collected and (b) does not weight the sample to account for the fact that we have a non-random size, speciality and location distribution.

In parallel, we present the key facts underlying Fig. 1 in Table 2. In this case, we consider all four combinations of weighting versus not weighting, and assuming zero collections versus assuming 10% collections. Typically, 80–90% of the effect of moving from the lower bound (estimates with

---

[3] For example, Hammer (2005) reports that the average netback rate (% of charges returned to doctors, after collection fees) is between 7 and 11%.

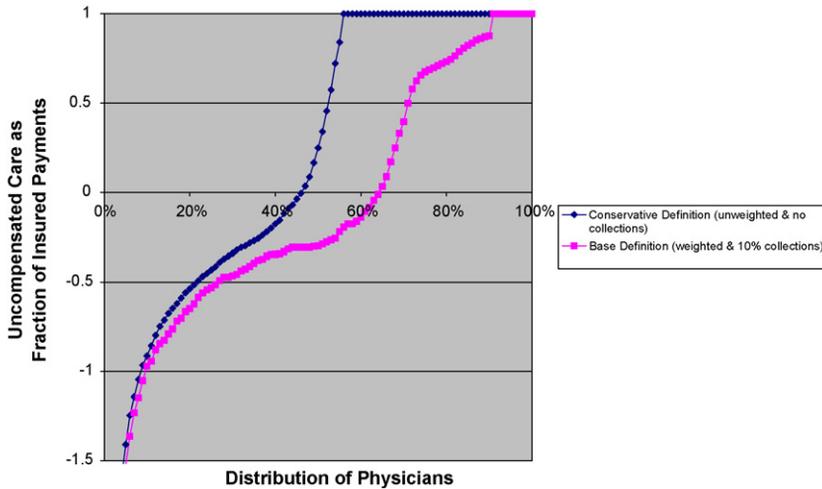[4] See, for example, Asplin et al. (2003) and Fairbrother et al. (2003).

Fig. 1. The distribution of physician uncompensated care.

weighting and assuming 10% collections) to the upper bound (no weighting and assuming no collections) is a result of the weighting, with a more minor effect for the collections assumption.

Fig. 1 shows the difference between what uninsured patients paid and the expected payment of insured patients (uncompensated care), as a fraction of that expected payment. We have scaled the graph so that higher numbers mean more uncompensated care. Thus, a value of 1 means the doctor received no payments from his uninsured patient; a value of 0 means his uninsured patients paid the same as what insured patients would have paid; and a negative value means the doctor found his uninsured patients more profitable.

While the magnitudes differ, both of these approaches tell a similar story: 45–59% of physicians actually provide *negative* uncompensated care; that is, they collect more, on average, from their uninsured patients than from their insured patients. Indeed, 12–14% of physicians found their uninsured patients more than twice as profitable as their insured patients; that is, the net payments from the uninsured were more than twice the expected payments from insured patients (points below −50% in Fig. 1). On the other hand, 1–7% of physicians delivered all care to their uninsured patients for free (values of 100% Fig. 1), and 17–30% of physicians delivered care to their uninsured patients at less than half the cost to insured patients.

The remainder of Table 2 shows the results separately for two different payer bases: privately insured and medicaid insured. In these cases, when computing the counterfactual amount that the uninsured would pay if insured, instead of using all insured, we use only patients in these categories. As discussed above, these cases provide useful bounds for the opportunity cost of seeing an uninsured patient. The corresponding data are plotted as well in Fig. 2. Note that the sample changes somewhat when we use different bases of insured patients.

The results for privately insured are similar to those for all payers, but the results for medicaid show considerably less uncompensated care. Compared to the rates received for the privately insured, physicians actually provide negative uncompensated care in 40–56% of the cases. Compared to the rates received for medicaid patients, however, physicians provide negative uncompensated care 59–76% of the time. That is, regardless of how it is measured, the majority of physicians in our sample receive more payment from the uninsured than they do from medicaid patients. Even more striking, relative to medicaid reimbursements, 42–57% of physicians

Table 2
Physician perspective—total uncompensated care for the uninsured

	Weighted (%) 10% collections	Weighted (%) No collections	Unweighted (%) 10% collections	Unweighted (%) No collections
Relative to all insured				
% Physicians earning 0 on uninsured	2.2	5.4	1.9	7.8
% Physicians earning 50% less on uninsured	17.1	20.7	26.2	30.5
% Physicians earning more on uninsured	58.3	57.1	46.8	44.4
% Physicians earning 50% more on uninsured	13.3	13.0	12.4	11.5
% Physicians earning 100% more on uninsured	3.1	2.8	2.9	2.8
Relative to private insurance				
% Physicians earning 0 on uninsured	2.2	5.4	2.1	8.0
% Physicians earning 50% less on uninsured	18.5	20.8	28.4	32.7
% Physicians earning more on uninsured	54.3	50.6	41.9	39.8
% Physicians earning 50% more on uninsured	11.2	11.0	10.0	9.5
% Physicians earning 100% more on uninsured	2.5	2.5	2.3	2.2
Relative to Medicaid				
% Physicians earning 0 on uninsured	3.3	8.4	2.2	10.1
% Physicians earning 50% less on uninsured	12.5	17.3	18.6	27.1
% Physicians earning more on uninsured	75.4	72.9	63.3	59.5
% Physicians earning 50% more on uninsured	57.8	55.5	43.8	41.5
% Physicians earning 100% more on uninsured	39.0	38.2	24.1	22.5

Note: Results from calculations described in text (and shown in Fig. 1). Top panel compares uninsured to all insured; next two panels divide comparison group into privately insured and medicaid insured. First column shows results for our base case that is weighted and assumes 10% collection rate; other columns vary weighting and collection assumption.

make 50% more on the uninsured, and 23–38% of physicians actually make twice as much on the uninsured as they do on medicaid patients.

Of particular interest is the total amount of uncompensated care delivered by physicians in our sample, which is equivalent to the area under the positive part of the curve in Fig. 1 minus the area under the negative part of the curve. Table 3 presents several statistics on uncompensated care. We find that uncompensated care, measured relative to all insured patients, is −0.07% of patient care revenues using our best estimate, and 0.59% of patient care revenue using our upper bound estimate. Relative to the privately insured, uncompensated care ranges from 0.24% of revenues to 0.8% of revenues. Relative to medicaid, however, uncompensated care ranges from −0.75% of revenues to 0.16% of revenues.

The next rows show dollars of uncompensated care delivered, on average, per visit by the uninsured. Compared to all insured, physicians deliver between −$2.10 and $19.86 in uncompensated
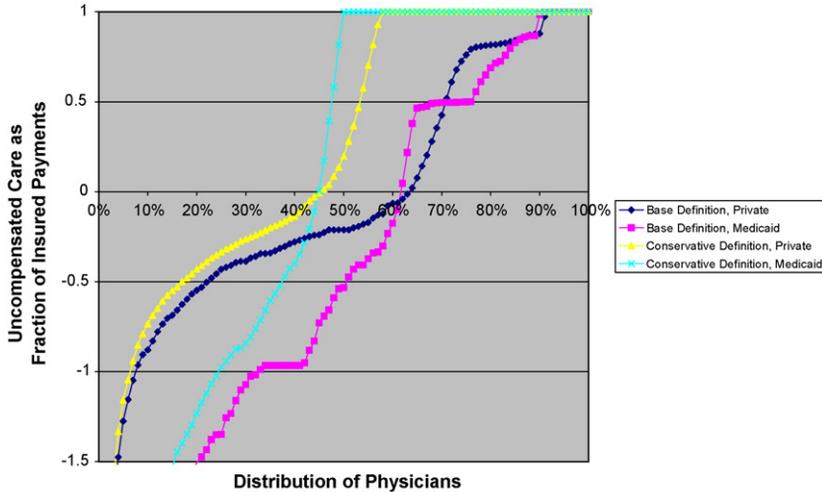
Fig. 2. The distribution of physician uncompensated care by insured payer.

care per visit by the uninsured. Compared to the privately insured, the range is from $67 to $26.60; compared to those on medicaid, the range is from −$15 to $4 per visit by the uninsured.

Uncompensated care is also highly concentrated among a fraction of providers. The next rows show that 1/10th of providers account for 62% of all uncompensated care, providing uncompensated care equal to 4.7–11.3% of their patient revenue. The top quarter of physicians generate an amount greater than the entire industry (that is, the other 75% generate negative uncompensated care).

We can also translate our findings to aggregate dollars of uncompensated care. Total physician practice revenues in the United States in 2004 were $399 billion. Our central findings suggest that uncompensated care was −0.07% of this amount, or negative $300 million. The range of opportunity costs and measurement approaches suggests that the amount of uncompensated care is fairly tightly estimated: it ranges from −0.72% (compared to medicaid, base definition), or −$2.9 billion, to 0.8% (compared to private insurance, conservative definition), or $3.2 billion.

3.2. Physician perspective—positive uncompensated care only

The analysis presented in the previous section considers the aggregate uncompensated care delivered by physicians, adding both the amounts of positive uncompensated care delivered to those who pay less than the insured, and the negative amounts of uncompensated care delivered to those who pay more than the insured.

As noted in the introduction, whether these negative and positive amounts should be combined depends on one's perspective on the current exercise. Our primary goal is to assess the aggregate amount of uncompensated care provided by physicians, which is used as an important yardstick by public policy makers, and we therefore incorporate both positive and negative uncompensated care in our calculations.

But this approach has the awkward feature that it presumes that negative uncompensated care is somehow "different" than other means that physicians have at their disposal to fund charity care. If a physician delivers care to some uninsured patients at a discount, he can offset that

Table 3
Total uncompensated care for the uninsured

	Weighted 10% collections	Weighted No collections	Unweighted 10% collections	Unweighted No collections
Relative to all insured				
Uncompensated care as % of patient revenues	−0.07%	0.09%	0.43%	0.59%
Average uncompensated care $ per uninsured visit	−$2.10	$2.61	$14.42	$19.86
Uncompensated care as % of revenues—top 10% docs	6.62%	7.88%	10.95%	12.24%
Uncompensated care as % of revenues—top 25% docs	3.02%	3.42%	3.99%	4.74%
Relative to private insurance				
Uncompensated care as % of patient revenues	0.24%	0.39%	0.65%	0.80%
Average uncompensated care $ per uninsured visit	$6.96	$11.30	$21.60	$26.65
Uncompensated care as % of revenues—top 10% docs	9.01%	10.15%	12.78%	14.37%
Uncompensated care as % of revenues—top 25% docs	4.11%	4.36%	5.42%	6.17%
Relative to Medicaid				
Uncompensated care as % of patient revenues	−0.72%	−0.50%	−0.06%	0.16%
Average uncompensated care $ per uninsured visit	−$14.95	−$9.94	−$1.42	$3.97
Uncompensated care as % of revenues—top 10% docs	5.01%	6.04%	8.18%	9.63%
Uncompensated care as % of revenues—top 25% docs	1.34%	1.90%	2.57%	3.17%

Note: Top panel compares uninsured to all insured; next two panels divide comparison group into privately insured and medicaid insured. First column shows results for our base case that is weighted and assumes 10% collection rate; other columns vary weighting and collection assumption. First row in each panel shows the average of the ratio of uncompensated care to patient revenues across our sample; the second row shows the average dollars of uncompensated care. Third and fourth rows show uncompensated care as a share of revenues for the 10 and 25% of physicians who provide the most uncompensated care.

loss in a number of ways beyond charging list prices to other uninsured patients, for example by charging more to privately insured patients or by seeing a more profitable mix of other patients. It is not clear why we should count higher prices to the uninsured "against" the amount of charity delivered when we don't consider these other offsets as well. Therefore, there is a coherent case for simply examining the positive uncompensated care delivered by physicians, and not offsetting against this the negative.

Table 4 repeats the calculations from Table 3, except it only looks at patients with positive uncompensated care. In other words, we sum the losses generated by those who underpay but we don't offset those losses by those who overpay. By this calculation, uncompensated care increases to 0.86–1.15% of revenues. This is still well below typical measures of uncompensated care for the physician sector. By comparing Tables 3 and 4, we can tell that for every dollar lost on an uninsured patient who pays less than an insured patient, between $0.56 and $0.93 is recovered from another uninsured patient who pays more than the average insured patient.

Table 4
Uncompensated care for the uninsured, underpayment only

	Weighted 10% collections	Weighted No collections	Unweighted 10% collections	Unweighted No collections
Relative to all insured				
Uncompensated care as % of patient revenues	0.86%	1.02%	0.99%	1.15%
Average uncompensated care $ per uninsured visit	$25.08	$29.70	$33.12	$38.47
Uncompensated care as % of revenues—top 10% docs	8.10%	9.29%	12.12%	13.41%
Uncompensated care as % of revenues—top 25% docs	3.82%	4.51%	5.06%	5.86%
Relative to private insurance				
Uncompensated care as % of patient revenues	1.07%	1.22%	1.14%	1.28%
Average uncompensated care $ per uninsured visit	$30.65	$34.93	$37.79	$42.78
Uncompensated care as % of revenues—top 10% docs	10.50%	11.32%	13.93%	15.23%
Uncompensated care as % of revenues—top 25% docs	4.88%	5.68%	6.37%	7.07%
Relative to Medicaid				
Uncompensated care as % of patient revenues	0.70%	0.96%	0.79%	1.03%
Average uncompensated care $ per uninsured visit	$14.40	$19.25	$20.00	$25.15
Uncompensated care as % of revenues—top 10% docs	7.30%	7.18%	9.45%	11.25%
Uncompensated care as % of revenues—top 25% docs	2.66%	3.44%	3.48%	4.31%

Note: Top panel compares uninsured to all insured; next two panels divide comparison group into privately insured and medicaid insured. First column shows results for our base case that is weighted and assumes 10% collection rate; other columns vary weighting and collection assumption. First row in each panel shows the average of the ratio of uncompensated care to patient revenues across our sample (using only *positive* uncompensated care, unlike Table 4); the second row shows the average dollars of uncompensated care. Third and fourth rows show uncompensated care as a share of revenues for the 10 and 25% of physicians who provide the most uncompensated care.

3.3. Patient perspective

How often do uninsured patients pay more than an uninsured patient would pay for the same care? Our results are shown in Table 5, and we again include versions without and without weighting, and with and without collections. Between 35 and 53% of patients receive some uncompensated care. That is, a minority of patients actually paid less than the typical insured patient receiving the same procedures, and 47–65% of uninsured patients actually paid *more* than the average insured patient.

We estimate that 26% of patients (44% if unweighted) paid nothing before collections, and for that group more than half of their cases were sent to collection agencies. Since we don't know what fraction of those patients ultimately made payments, we leave the 10% collections column blank. On the other hand, we find that 8.5–9.6% of uninsured patients paid more than double what their insured counterparts paid for the same procedure.

Table 5
Patient perspective—uncompensated care for the uninsured

	Weighted (%) 10% collections	Weighted (%) No collections	Unweighted (%) 10% collections	Unweighted (%) No collections
Relative to all insured				
% Visits with no payment	–	26.9	–	44.1
% Visits paying 50% less than insured	29.0	29.9	46.2	47.6
% Visits paying more than insured	64.2	64.1	46.5	46.2
% Visits paying 50% more than insured	26.6	26.5	21.7	21.6
% Visits paying 100% more than insured	9.6	9.6	8.6	8.5
Relative to private insurance				
% Visits with no payment	–	26.6	–	42.6
% Visits paying 50% less than insured	29.3	29.9	45.6	46.7
% Visits paying more than insured	63.4	63.3	45.6	45.4
% Visits paying 50% more than insured	22.1	22.1	17.1	17.0
% Visits paying 100% more than insured	7.6	7.6	6.5	6.5
Relative to Medicaid				
% Visits with no payment	–	35.0	–	50.4
% Visits paying 50% less than insured	23.9	37.2	45.7	52.4
% Visits paying more than insured	61.7	60.9	46.2	44.9
% Visits paying 50% more than insured	50.5	50.2	38.2	37.6
% Visits paying 100% more than insured	32.1	31.9	24.9	24.5

Note: Results from calculations described in text. Top panel compares uninsured to all insured; next two panels divide comparison group into privately insured and medicaid insured. First column shows results for our base case that is weighted and assumes 10% collection rate; other columns vary weighting and collection assumption.

If we use private insurance or medicaid as our baseline, we find roughly the same share of patients receiving uncompensated care, but the magnitude of uncompensated care is different: for 25–33% of the visits, for example, the patient paid twice what the average medicaid patient would have paid. Note once again that the results are somewhat different across these panels due to a changing sample of physicians.

3.4. Prices charged

One interesting question that can be addressed using our data is whether uncompensated care arises mostly from physicians charging lower prices to the uninsured than to the insured (ex-ante discounts), or from the uninsured not paying full the amounts charged to them (ex-post writeoffs). That is, if uninsured patients paid the amount that they were billed, how much uncompensated care would there be?

The evidence here clearly shows that most uncompensated care arises from the uninsured not paying their bills, rather than receiving ex-ante discounts (relative to the insured). Only 13% of the uninsured were billed less than the insured; only 7% were billed nothing, and only 8% were billed half or less of the amount billed to the insured (including the 7% who were billed nothing). On the other hand, 87% of the uninsured were billed more than the insured, reflecting the discounts off list prices received by the insured but not shared by the uninsured. Forty-four percent of the uninsured were charged 50% more than the insured, and 23% of the uninsured were charged double or more the amount charged to the insured.

Table 6
Uncompensated care, calculated from list prices

	Weighted 10% collections	Weighted No collections	Unweighted 10% collections	Unweighted No collections
% Providers who collect less than list price	94.8%	94.8%	95.1%	95.1%
% Visits with payment less than list price	39.8%	39.8%	57.0%	57.0%
Average % underpayment	48.7%	51.7%	64.4%	67.7%
Average $ underpayment, per visit	$93.36	$98.93	$121.39	$127.63
Underpayment as % of patient revenue, calculated from list prices	2.7%	2.8%	3.0%	3.2%

Note: First column shows results for our base case that is weighted and assumes 10% collection rate; other columns vary weighting and collection assumption.

3.5. Actual versus reported uncompensated care

Our results thus far are quite striking, suggesting that physicians don't actually provide much uncompensated care, despite survey evidence to the contrary. Is this result because physicians aren't reporting the truth in surveys, or because they are calculating uncompensated care relative to list rather than discounted prices?

The evidence here strongly favors the latter interpretation. Table 6 shows uncompensated care computed in the "traditional" way. This table mimics our procedure, but instead compares the amounts paid by the uninsured to list prices (rather than net payments by the insured). The vast majority of physicians collect less than list prices from their uninsured patients, and 40–57% of visits by the uninsured result in a payment below list price. The average "underpayment" (amount paid less than list price) ranges from 48.7–67.7%. Relative to list prices, then, physicians are providing uncompensated care on average of $93 to $128 per visit, or 2.7–3.2% of revenues, well above the amounts we show in Table 3.

These estimates are about half of the share of practice time devoted to charity care reported by Cunningham and May (2006), but that charity care level included any patient for whom charity care was provided, insured or not. As noted earlier, Kilpatrick et al. (1991) found that about half of uncompensated care was delivered to the uninsured; extrapolating to our results, we would estimate total uncompensated care levels of 5.4–6.4%, which is directly in line with the Cunningham and May estimates. Therefore, we conclude that the high levels of uncompensated care reported in previous studies are the result not of poor reporting, but rather of a (in our opinion, faulty) comparison to list prices.

4. Part IV: Potential biases to the calculation

We find that physicians deliver, on net, very little (if any) uncompensated care, but several features of our analysis suggest caution before extrapolating this result. In this section, we explore these concerns further.

4.1. Bias from elective processes?

A primary concern with our results is that we are defining insurance status at the visit level, not the patient level. Thus, some of our "uninsured" visits may actually be from insured patients

Table 7
Most frequent diagnoses for uninsured (compared to insured)

Diagnosis	UI rank	UI %	Ins rank	Ins %
V202: Routine infant or child health check	1	1.73	1	2.16
78650: Chest pain, unspecified	2	1.66	6	.92
V0481: Need For prophylactic vaccination and inoculation against influenza	3	1.28	2	1.22
4659: Acute upper respiratory infections of unspecified site	4	1.06	4	1.06
V700: Routine general medical examination at a health care facility health checkup	5	.98	5	1.05
V7231: Special investigations and examinations, routine gynecological examination	6	.97	3	1.2
462: Acute pharyngitis	7	.85	7	.87
3671: Myopia	8	.84	324	.03
4011: Essential hypertension, benign	9	.84	10	.63
4660: Acute bronchitis	10	.81	9	.64
78900: Abdominal pain, unspecified site	11	.67	23	.35
V221: Supervision of other normal pregnancy	12	.67	8	.74
4619: Acute sinusitis, unspecified	13	.66	11	.6
7242: Lumbago	14	.6	13	.53
4019: Essential hypertension, unspecified	15	.57	18	.4
5990: Urinary tract infection, site not specified	16	.52	19	.39
7295: Pain in limb	17	.45	28	.31
311: Depressive disorder, not elsewhere classified	18	.42	47	.2
25000: Diabetes mellitus without mention of complication, type Ii or unspecified type, not stated as uncontrolled	19	.41	29	.3
V222: Pregnant state, incidental	20	.39	26	.32

Note: First column shows rank of procedure for uninsured; second column shows share of uninsured procedures that are represented by that procedure; third and fourth columns do the same for the insured.

who are not covered for that particular visit. For example, if our data include a large number of patients receiving elective or cosmetic procedures not covered by insurance (or patients choosing to pay cash to avoid insurance constraints), then this should not count against the uncompensated care delivered to those truly uninsured. In this section, we address that concern, and show it not to be a significant determinant of our findings.

Table 7 shows the 20 most common diagnoses for uninsured patients in the sample. The first column shows the ranking of that procedure in terms of frequency for the uninsured, and the second column shows the share of uninsured visits for which this was the primary diagnosis. The third column shows the comparable rank for the insured and the share of insured visits for which this was the primary diagnosis.

There is a very strong correspondence across these groups. Fourteen of the 20 most common diagnoses for the uninsured are also in the top 20 diagnoses for the insured; 18 are in the top 30 diagnoses for the insured. The shares are also very similar. Thus, the procedures which make up the most common treatments of the uninsured are common procedures performed on the insured as well; our data do not appear to largely reflect "elective" procedures that are uncovered for that visit. At the same time, there are clearly examples of this type of visit in our data, as shown by the row for "myopia", which is very common for the uninsured and not so for the insured; this clearly reflects the fact that many of those treated for myopia are insured individuals not covered by that service.

To address this issue more comprehensively, we ranked all procedures by the fraction of the time they were performed on uninsured patients. For example, 40% of patients receiving acupuncture appear uninsured; presumably this includes patients who have insurance that won't cover the procedure. On the other hand, only 1.6% of patients receiving a pap smear are uninsured; since virtually all insurance (other than hospital-only coverage) would cover this procedure, the patients reported uninsured are presumably truly uninsured.

We then replicated our analysis excluding subsets of procedures with particularly high shares of uninsured (like myopia or acupuncture), on the grounds that these procedures may represent care actually delivered to the insured. In fact, if we exclude all procedures where more than 15% of the users were uninsured, our estimate of total uncompensated care remains unchanged. As we lower the cut-off and exclude more procedures, our estimate of uncompensated care per visit actually *falls*. This result is sensible: patients classified as uninsured for elective procedures are more likely to be actually insured, and are therefore more likely to pay their bills. If we only looked at procedures where less than 3% of patients were uninsured (which excludes half of the procedures done), uncompensated care per visit is cut in half. This is strong evidence that our results aren't driven by elective procedures.

4.2. Bias from out of network physicians?

Another source of bias to our calculations could be that our "uninsured" patients are really insured patients who aren't receiving elective procedures—but who are receiving them from "elective physicians", that is physicians who are not covered by their insurance. This should not be a major issue for our analysis, since even if patients are going out of network their utilization will be reported back to their insurance and they will be classified as insured patients in our data. Nevertheless, we can investigate the importance of this issue by excluding from our sample physicians who appear to be "elective": that is, physicians where the uninsured are likely to pay the full bill. Of course, this approach confounds the issue by *also* getting rid of those physicians who are most aggressive in collecting from the "truly uninsured", so in doing so we will by definition overstate the amount of uncompensated care delivered.

Even this aggressive approach, however, does not suggest that such elective physicians are driving our results. If we remove from our sample all physicians where half or more of their uninsured patients pay their full bill, the amount of uncompensated care delivered in aggregate in our sample rises from only −0.07% (our best estimate from Table 3) to 0.66% of revenues—still a very small number compared to reported uncompensated care.

4.3. Bias from health differences by insurance status

Our assumption that the payments from insured patients represent the opportunity cost of uninsured patients rests on a presumption that the two groups are similarly costly to treat. If an uninsured patient is much sicker, however, and therefore requires more physician time or effort, then the relevant opportunity cost may not be payment from an insured patient but some higher figure. Of course, if this variation is reflected only in the different procedures performed on insured and uninsured patients, then it is captured by our procedure-specific methodology. There may, however, be variation in health across insurance types within procedure—perhaps a 15-min office visit from an uninsured patient requires more effort than a 15-min visit from an insured patient.

To test this hypothesis, we use the diagnoses which are recorded as part of each visit, and assume that visits with more diagnoses require more effort. Our data shows that the uninsured

on average have no more diagnoses per visit than patients with other types of coverage: 1.58 diagnoses per visit the uninsured patient, 1.60 for medicaid, 1.64 for private insurance, and 2.07 for medicare.

However, the comparison above could be misleading if the uninsured population is somehow different, or seeing a different set of doctors (although Table 1 suggests that this is not the case). For example, a patient visiting a dermatologist for acne will likely to have only one diagnosis for his visit, but if the same patient visited a general practitioner for a yearly physical, the list might be longer. To be sure we're comparing similar visits, we can ask the question differently: "For every visit for a respiratory infection, how many other diagnoses were recorded as part of that visit?" If we ask the question for any of the most common diagnoses – chest pain, respiratory infections, stomach ache, routine exam, or pharyngitis – the result is always the same: the uninsured have fewer diagnoses recorded per visit, and therefore appear no less healthy than insured patients. If anything, they appear healthier.

4.4. Bias from cost-shifting?

One limitation of our analysis is that it ignores the fact that the prices charged the insured may themselves be directly influenced by the level of uncompensated care provided, through the mechanism of cost-shifting. If a physician raises his prices on insured patients to compensate for uninsured patients who underpay, there is a potential bias from our using those prices to measure the level of uncompensated care. However, raising prices on the insured to pay for the uninsured will increase the level of uncompensated care, not decrease it. Therefore, if price-shifting exists in our data, the amount of uncompensated care will be overstated. Our analysis of this issue suggests that any effect of price-shifting is very modest.

5. Part IV: Conclusions and implications

The provision of uncompensated care is an important touchstone for health care policy in the U.S. Many argue that the uninsured are already implicitly insured through the provision of uncompensated care. Others use the existence of uncompensated care as a justification for, and potential financing source of, universal insurance coverage. But such debates begin with a flawed definition of uncompensated care that does not recognize the realities of the U.S. health care market, and in particular the enormous discounts delivered to insured patients relative to the list prices charged the uninsured.

In this paper, we have considered an alternative approach which recognizes those discounts by comparing the prices paid to the uninsured to those paid by the insured. Doing so provides a very different picture of the level of uncompensated care provided by physicians. While the physicians in our sample appear to be providing charity care for the uninsured that amounts to between 2.7 and 3.2% of their practice revenues, in fact the uninsured are paying *more*, on net, for their care than are the insured. At most, the uninsured are receiving price discounts that are 0.8% of practice revenues.

This is a striking finding which throws into doubt many of the arguments noted above. Of course, physician uncompensated care is only a minority of the total amount of uncompensated care provided in the U.S. The important question is whether applying the type of approach considered here to hospitals would lead to dramatic reductions in their reported uncompensated care.

The computations of hospital uncompensated care from the AHA also rely on list prices, which would tend to overstate uncompensated care by the arguments provided here. At the same time,

the AHA adjusts reported uncompensated care downward by the hospital's overall cost/charge ratio, which will bring the opportunity cost measure more in line with net payments from the insured (although probably not all the way). Moreover, the uninsured are likely to be paying a much smaller fraction of their (large) hospital bills than they are of their (smaller) physician bills, which suggests that hospitals aren't getting as much return as physicians on the uninsured.

Thus, it seems clear that the AHA measure of uncompensated care overstates hospital uncompensated care much less than do survey measures of physicians. Whether the AHA measure overstates uncompensated care at all, and by how much, is an important topic for future research.

Acknowledgements

References

American Hospital Association (AHA), October 2006. Uncompensated Hospital Care Cost Fact Sheet.

Asplin, B.R., Rhodes, K.V., Crain, L., Kellermann, A.L., Lurie, N., 2003. Insurance without care: unreliable access to emergency department follow-up care. Academic Emergency Medicine 10 (5), 546–547.

Cunningham, P.J., May, J.H., May 2006. A growing hole in the safety net: physician charity care declines again. Center for Health Systems Change Tracking Study Number 13. Available at http://hschange.org/CONTENT/826/826.pdf.

Duncan, R.P., Kilpatrick, K., 1987. Data watch: unresolved hospital charges in Florida. Health Affairs, 157–166.

Fairbrother, G., Gusmano, M.K., Park, H.L., Scheinmann, R., 2003. Care for the uninsured in general internists' private offices. Health Affairs 22 (6), 217–224.

Hammer, D.C., July 2005. Performance is reality: how is your revenue cycle holding up? Healthcare Financial Management.

Healthcare Financial Management, 2007. Steven T. Miller: the IRS perspective on charity care.

Kerry, K., Miller, M., Dwyer, J., Nissen, D., 1991. Uncompensated care provided by private practice physicians in Florida. HSR: Health Services Research 26, 277–302.

Ohsfeldt, Robert, 1985. Uncompensated medical services provided by physicians and hospitals. Medical Care 23, 1338–1344.

Saywell, R., et al., 1989. Hospital and patient characteristics of uncompensated hospital care: policy implications. Journal of Health Politics Policy and Law 14, 287–307.

Sloan, F., Cromwell, J., Mitchell, J.B., 1978. Private Physicians and Public Programs. DC Health Publishing Company, Lexington, MA.

Texas Department of State Health Services, 2005. Annual Statement of Community Benefits Standard – 2005. Texas Nonprofit Hospitals.

The Catholic Health Association, 2005. Community Benefit Reporting.

Weissman, J.S., Van Deusen Lukas, C., Epstein, A.M., 1992. Bad debt and free care in Massachusetts Hospitals. Health Affairs, 148–161.