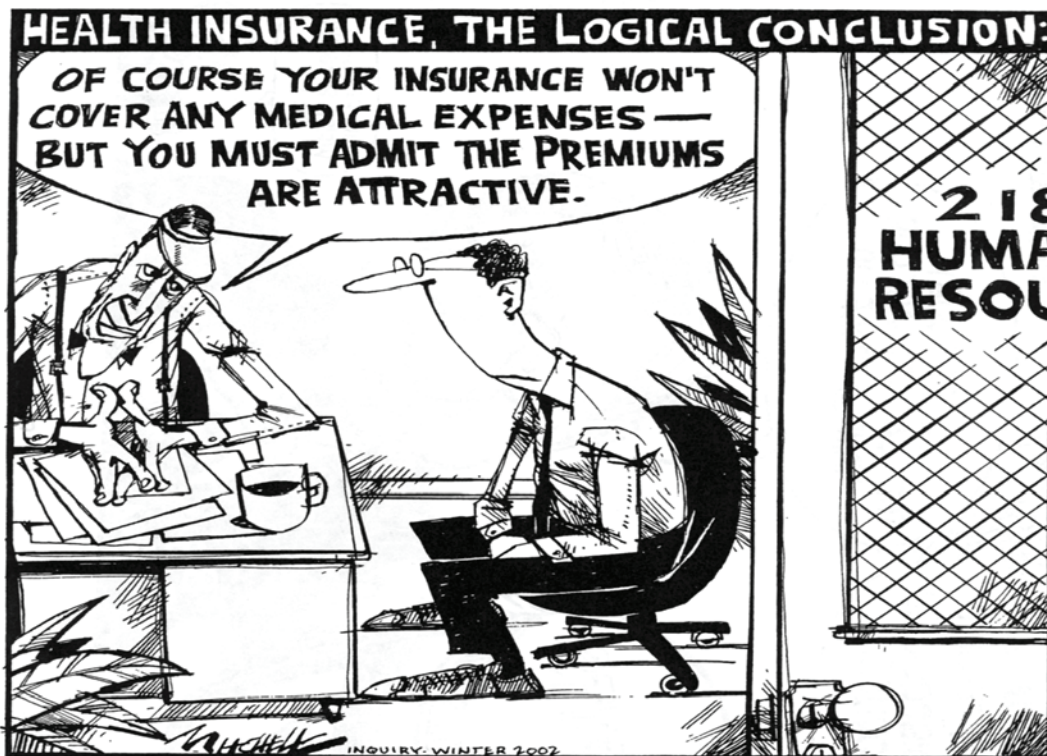# Patients need single payer

Talking Point 1

Medical bills contribute to nearly two-thirds of all bankruptcies; three-quarters of those bankrupted had health insurance at the time they got sick or were injured.

Medical Bankruptcy in the United States, 2007: Results of a National Study

David U. Himmelstein, MD,[a] Deborah Thorne, PhD,[b] Elizabeth Warren, JD,[c] Steffie Woolhandler, MD, MPH[a]

[a]Department of Medicine, Cambridge Hospital/Harvard Medical School, Cambridge, Mass; [b]Department of Sociology, Ohio University, Athens; and [c]Harvard Law School, Cambridge, Mass.

ABSTRACT

BACKGROUND: Our 2001 study in 5 states found that medical problems contributed to at least 46.2% of all bankruptcies. Since then, health costs and the numbers of un- and underinsured have increased, and bankruptcy laws have tightened.

METHODS: We surveyed a random national sample of 2314 bankruptcy filers in 2007, abstracted their court records, and interviewed 1032 of them. We designated bankruptcies as "medical" based on debtors' stated reasons for filing, income loss due to illness, and the magnitude of their medical debts.

RESULTS: Using a conservative definition, 62.1% of all bankruptcies in 2007 were medical; 92% of these medical debtors had medical debts over $5000, or 10% of pretax family income. The rest met criteria for medical bankruptcy because they had lost significant income due to illness or mortgaged a home to pay medical bills. Most medical debtors were well educated, owned homes, and had middle-class occupations. Three quarters had health insurance. Using identical definitions in 2001 and 2007, the share of bankruptcies attributable to medical problems rose by 49.6%. In logistic regression analysis controlling for demographic factors, the odds that a bankruptcy had a medical cause was 2.38-fold higher in 2007 than in 2001.

CONCLUSIONS: Illness and medical bills contribute to a large and increasing share of US bankruptcies.

© 2009 Elsevier Inc. All rights reserved. • The American Journal of Medicine (2009) 122, 741-746

KEYWORDS: Bankruptcy; Health care costs; Health economics

As recently as 1981, only 8% of families filing for bankruptcy did so in the aftermath of a serious medical problem.[1] By contrast, our 2001 study in 5 states found that illness or medical bills contributed to about half of bankruptcies.[2]

Since then, the number of un- and underinsured Americans has grown;[3] health costs have increased; and Congress tightened the bankruptcy laws.[4]

Here we report the first-ever national random-sample survey of bankruptcy filers.

METHODS

We used 3 data sources: questionnaires mailed to debtors immediately after bankruptcy filing; court records; and telephone interviews with a sub-sample of debtors.

Sample Design

Between January 25 and April 11, 2007, we obtained from Automated Access to Court Electronic Records, a list of all 118,308 bankruptcy petitions filed in the US. We excluded filings in Guam and Puerto Rico, nonpersonal bankruptcies, and cases missing a name or address. Within 2 weeks of their filings, we mailed introductory letters to 5251 randomly selected debtors; 275 were returned as undeliverable. We then mailed self-administered questionnaires to the 4976 debtors with valid addresses; 2314 (46.5%) were completed and returned; 124 were returned incomplete (2.5%); and 83 (1.7%) declined to participate; 2455 (49.3% of those with valid addresses) did not respond.

We compared court records (described below) of respondents with a random sample of 99 nonrespondents. Nonre-

spondents resembled respondents in income, assets, debts, net worth, market value of homes, and history of prior bankruptcy.

Questionnaire

Introductory letters described the study and offered debtors the option of obtaining a Spanish-language version of the questionnaire. The questionnaire and $2 were mailed a few days later. Nonrespondents received replacement questionnaires, another $2, and were invited to respond via telephone or on-line. Subsequently, we offered nonrespondents $50 to complete the questionnaire.

The questionnaire asked about demographics, health insurance, and gaps in coverage, occupation, employment, housing, and efforts to cope financially before filing. It also asked about specific reasons for filing for bankruptcy; the range of out-of-pocket medical expense (none, $1-$999, $1000-$5000, or >$5000); loss of work-related income; and borrowing to pay medical bills. Finally, it asked respondents if, for $50, they would be willing to complete a follow-up interview.

Court Records

We obtained the public bankruptcy court records of respondents and the sample of nonrespondents from the federal court's electronic filing system. Research assistants (mainly law students) abstracted each record.

The court records included the chapter of filing, income, assets, and debts outstanding at the time of filing. These records indicate the creditor to whom money is owed, but not why the debt was incurred.

Telephone Interviews

There were 2314 debtors who completed questionnaires, 2007 of whom were willing to be interviewed. By February 2008, research assistants had completed telephone interviews (in English or Spanish) with 1032 of them; 69 debtors no longer wished to be interviewed. We were unable to reach 906.

Interviewers collected additional detail about employment, finances, housing, borrowing to pay medical bills, and whether medical bills or income loss due to illness had contributed to their bankruptcy (questions we used to verify written questionnaire responses from the entire sample of 2314 debtors).

The 1032 telephone interviews identified 639 patients (debtors or dependents) whose health problems contributed to bankruptcy; details about medical expenses, health insur-

ance, and diagnoses were obtained. Two physicians grouped diagnoses into 14 categories.

Telephone survey participants resembled other respondents on most financial and demographic characteristics. They were slightly older and better educated.

> ## CLINICAL SIGNIFICANCE
>
> - 62.1% of all bankruptcies have a medical cause.
> - Most medical debtors were well educated and middle class; three quarters had health insurance.
> - The share of bankruptcies attributable to medical problems rose by 50% between 2001 and 2007.

Data Analysis

We used data from the questionnaires and court records to analyze demographics, health insurance coverage at the time of filing, and gaps in coverage.

The questionnaires were the basis for our 2001-2007 time trend analysis. For this analysis, we replicated the most conservative definition employed in the 2001 study, which designated as "medically bankrupt" debtors citing illness or medical bills as a specific reason for bankruptcy; OR reporting uncovered medical bills >$1000 in the past 2 years; OR who lost at least 2 weeks of work-related income due to illness/injury; OR who mortgaged a home to pay medical bills. Debtors who gave no answers regarding reasons for their bankruptcy were excluded from analyses.

For all other analyses (ie, those not reporting time trends) we adopted a definition of medical bankruptcy that utilizes the more detailed 2007 data. We altered the 2001 criteria to include debtors who had been forced to quit work due to illness or injury. We also reconsidered the question of how large out-of-pocket medical expenses should be before those debts should be considered contributors to the family's bankruptcy. Although we needed to use the threshold of $1000 in out-of-pocket medical bills for consistency in the time trend analyses, we adopted a more conservative threshold—$5000 or 10% of household income—for all other analyses. Adopting these more conservative criteria reduced the estimate of the proportion of bankruptcies due to illness or medical bills by 7 percentage points.

To arrive at nationally representative estimates, we weighted the data to adjust for the slight underrepresentation of respondents who filed under Chapter 13 (bankruptcies with repayment plans). In calculating mean out-of-pocket medical expenses from our telephone interviews, we trimmed outliers at $100,000.

Chi-squared and 2-tailed t tests were used for univariate analyses. We used forward stepwise logistic regression analysis on the 2007 cohort to assess predictors of medical bankruptcy and predictors of home loss or foreclosure among homeowners. Finally, we performed logistic regression using the combined 2001 and 2007 cohorts to examine whether the odds of a bankruptcy being medical were higher in 2007 than in 2001, after controlling for demographics, income, and insurance status. SAS Version 9.1 (SAS Institute Inc., Cary, NC) was used for all analyses.

Table 1   Demographic Characteristics of 2314 Bankruptcy Filers and Comparison of Medical and Nonmedical Filers, 2007*

	All Bankruptcies	Medical Bankruptcies	Nonmedical Bankruptcies	P Value Medical vs Nonmedical Bankruptcies
Mean age	44.4 years	44.9 years	43.3 years	.01
Debtor or spouse/partner male	44.5%	44.9%	44.3%	NS
Married	43.9%	46.3%	40.1%	.02
Mean family size—debtors + dependents	2.71	2.79	2.63	.02
Attended college	61.9%	60.3%	65.8%	.02
Homeowner or lost home within 5 years	66.7%	66.4%	67.8%	NS
Current homeowner	52.3%	52.0%	53.2%	NS
Occupational prestige score >20	87.3%	86.1%	89.8%	.01
Mean (median) monthly household income at time of bankruptcy filing	$2676 ($2299)	$2586 ($2225)	$2851 ($2478)	.002
Debtor or spouse/partner currently employed	79.2%	75.5%	85.0%	.001
Debtor or spouse/partner active duty military or veteran	19.4%	20.1%	18.4%	NS
Market value of home (mean)	$147,776	$141,861	$159,145	.03
Mean net worth (assets—debts)	−$41,474	−$44,622	−$37,650	NS

*Bankruptcies meeting at least one of the following criteria: illness, injury or medical bills listed as specific reason for filing OR uncovered medical bills >$5000 or >10% of annual family income OR, lost ≥2 weeks of work-related income due to illness/injury, OR depleted home equity to pay medical bills.

Human subject committees at Harvard Law School and The Cambridge Health Alliance approved the project.

RESULTS

The demographic characteristics of our sample are shown in Table 1. Most debtors were middle aged, middle class (by occupational prestige),[5] and had gone to college. Their modest incomes reflect the financial setbacks common in the peri-bankruptcy period. Two thirds were homeowners.

Compared with other debtors, medical debtors had slightly lower incomes, educational attainment, and occupational prestige scores; more were married and fewer were employed (reflecting more disability). Medical debtors were older and had larger families. Although similar proportions were homeowners, medical debtors' homes had 11% lower market value. The average net worth was similar (and negative) for medical and nonmedical debtors (−$44,622 vs −$37,650, P >.05).

Medical Causes of Bankruptcy

Illness or medical bills contributed to 62.1% of all bankruptcies in 2007 (Table 2).

Unaffordable medical bills and income shortfalls due to illness were common; 57.1% of the entire sample (92% of the medically bankrupt) had high medical bills, proportions that did not vary by insurance status; 5.7% of homeowners had mortgaged their homes to pay medical bills; 40.3% of the entire sample had lost income due to illness; 95% of the lost-income debtors also had high medical bills.

Data from the detailed telephone survey yielded confirmatory results. When asked about problems that contributed very much or somewhat to their bankruptcy, 41.8% of interviewees specifically identified a health problem, 54.9%

cited medical or drug costs, and 37.8% blamed income loss due to illness. Overall, 68.8% cited at least one of these medical causes. An additional 6.8% had recently borrowed money to pay medical bills.

Insurance Status of Debtors and Dependents

Less than one quarter of debtors—whether medical or nonmedical—were uninsured when they filed for bankruptcy; an additional 7% had uninsured family members (Table 3). Medically bankrupted families, however, had more often experienced a lapse in coverage during the 2 years before filing (40.0% vs 34.1%, P = .005).

Table 2   Medical Causes of Bankruptcy, 2007*

	Percent of All Bankruptcies
Debtor said medical bills were reason for bankruptcy	29.0%
Medical bills >$5000 or >10% of annual family income	34.7%
Mortgaged home to pay medical bills	5.7%
Medical bill problems (any of above 3)	57.1%
Debtor or spouse lost ≥2 weeks of income due to illness or became completely disabled	38.2%
Debtor or spouse lost ≥2 weeks of income to care for ill family member	6.8%
Income loss due to illness (either of above 2)	40.3%
Debtor said medical problem of self or spouse was reason for bankruptcy	32.1%
Debtor said medical problem of other family member was reason for bankruptcy	10.8%
Any of above	62.1%

*Percentage based on recent homeowners rather than all debtors.

Table 3 Health Insurance Status of Debtor Households With and Without Medical Causes of Bankruptcy

	Medical Bankruptcy	Nonmedical Bankruptcy	P Value
Debtor or a dependent uninsured at time of bankruptcy filing	30.8%	30.7%	.93
Debtor or a dependent had a lapse in coverage during 2 years before bankruptcy filing	40.0%	34.1%	.005

In multivariate analysis, being uninsured at filing did not predict a medical cause of bankruptcy, while a gap in coverage did (odds ratio [OR] = 1.35, P = .002). Other predictors included: older age (OR = 1.016/year, P = .0001), married (OR = 1.59, P = .0001), female (OR = 1.34, P = .002), larger household (OR = 1.97/household member, P = .01), and lower income quartile (OR = 1.30, P = .0001).

Medical debtors' court records identified more debt owed directly to doctors and hospitals than did nonmedical debtors', a mean of $4988 vs $256, respectively ($P$ <.0001). Medical debtors with coverage gaps owed providers a mean of $8338, vs $2740 ($P$ <.0001) for medical debtors with continuous coverage. Nonmedical debtors had few medical debts, averaging under $300 regardless of insurance status. (Medical debts financed through credit cards or other borrowing, or owed to collection agencies are not included because they cannot be identified through court records.)

Patients Whose Illness Contributed to Bankruptcy

Telephone interviews identified 639 patients whose illness contributed to bankruptcy: the debtor or spouse in 77.9% of cases; a child in 14.6%; and a parent, sibling or other adult in 7.5%. At illness onset, 77.9% were insured: 60.3% had private insurance as their primary coverage; 10.2% had Medicare; 5.4% had Medicaid; and 2% had Veterans Affairs/military coverage. Few of the uninsured lacked coverage because of a preexisting condition (2.8%) or belief that coverage was unnecessary (0.3%); nearly all cited economic reasons.

By the time of bankruptcy, the proportion of patients with private coverage had fallen to 54.1%, while the percentage with Medicare and Medicaid had increased to 16.4% and 9.9%, respectively. The proportion whose employers contributed to coverage decreased from 43.2% to 36.6%.

Out-of-pocket medical costs averaged $17,943 for all medically bankrupt families: $26,971 for uninsured patients, $17,749 for those with private insurance at the outset, $14,633 for those with Medicaid, $12,021 for those with Medicare, and $6545 for those with Veterans Affairs/mili-

tary coverage. For patients who initially had private coverage but lost it, the family's out-of-pocket expenses averaged $22,568.

Among common diagnoses, nonstroke neurologic illnesses such as multiple sclerosis were associated with the highest out-of-pocket expenditures (mean $34,167), followed by diabetes ($26,971), injuries ($25,096), stroke ($23,380), mental illnesses ($23,178), and heart disease ($21,955).

Hospital bills were the largest single out-of-pocket expense for 48.0% of patients, prescription drugs for 18.6%, doctors' bills for 15.1%, and premiums for 4.1%. The remainder cited expenses such as medical equipment and nursing homes. While hospital costs loomed largest for all diagnostic groups, for about one third of patients with pulmonary, cardiac, or psychiatric illnesses, prescription drugs were the largest expense.

Our telephone interviews indicated the severity of job problems caused by illness. In 37.9% of patients' families, someone had lost or quit a job because of the medical event; 24.4% had been fired, and 37.1% subsequently regained employment. In 19.9% of families suffering a job loss, the job loser was a caregiver.

Changes in Medical Bankruptcy, 2001 to 2007

In our 2007 study, 69.1% of the debtors met the legacy definition of medical bankruptcy employed in our 2001 study, a 22.9 percentage point absolute increase (49.6% relative increase) from 2001, when 46.2% met this definition (P <.0001). Inflation, which might edge families over our $1000 medical debt threshold, did not account for this change. An analysis that used all criteria except the size of medical debts found a 48.7% relative increase. An analysis limited to the 5 states in our 2001 study yielded virtually identical findings.

In multivariate analysis, a medical cause of bankruptcy was more likely in 2007 than in 2001 (OR = 2.38, P <.0001) (Table 4).

DISCUSSION

In 2007, before the current economic downturn, an American family filed for bankruptcy in the aftermath of illness every 90 seconds; three quarters of them were insured.

Since 2001, the proportion of all bankruptcies attributable to medical problems has increased by 50%. Nearly two thirds of all bankruptcies are now linked to illness.

How did medical problems propel so many middle-class, insured Americans toward bankruptcy? For 92% of the medically bankrupt, high medical bills directly contributed to their bankruptcy. Many families with continuous coverage found themselves under-insured, responsible for thousands of dollars in out-of-pocket costs. Others had private coverage but lost it when they became too sick to work. Nationally, a quarter of firms cancel coverage immediately when an employee suffers a disabling illness; another quar-

Table 4   Multivariate Predictors of Medical Causes of Bankruptcy, 2001 and 2007 Combined

	Odds Ratio	95% Confidence Interval	P Value
Age	1.02	1.01–1.02	.0001
Married	1.32	1.13–1.55	.0006
Own home now or in past 5 years	1.10	0.93–1.30	NS
All family members insured at time of filing	1.23	1.03–1.46	.02
Gap in health insurance coverage for any family member within past 2 years	1.64	1.38–1.94	.0001
Income quartile	.99	.82–1.07	NS
Attended college	1.02	.87–1.18	NS
Year of bankruptcy filing, 2007 vs 2001	2.38	2.05–2.77	.0001

ter do so within a year.[6] Income loss due to illness also was common, but nearly always coupled with high medical bills.

The present study and our 2001 analysis provide the only data on large cohorts of bankruptcy filers derived from in-depth surveys. As with any survey, we depend on respondents' candor. However, we also had independent checks—from court records filed under penalty of perjury—on many responses. Because questionnaires and court records were available for our entire sample, we used them for most calculations. The lowest plausible estimate of the medical bankruptcy rate from these sources is 44.4%—the proportion who directly said that either illness or medical bills were a reason for bankruptcy. But many others gave reasons such as "aggressive collection efforts" or "lost income due to illness" and had large medical debts. Indeed, detailed telephone interview data available for 1032 debtors revealed an even higher rate of medical bankruptcy than our 62.1% estimate—at least 68.8% of all filers.

Our current methods address concerns expressed about our previous survey. We assembled a random, national sample and asked far more detailed questions. In addition, we adopted more stringent criteria for medical bankruptcy. Adopting an even more stringent threshold for medical debts (eg, eliminating those with medical debts below 10% of family income) would reduce our estimate by <1%.

Teasing causation from cross-sectional data is challenging. Multiple factors push families into bankruptcy. Yet, our data clearly establish that illness and medical bills play an important role in a large and growing proportion of bankruptcies.

Changes in the Law

Between our 2001 and 2007 surveys, Congress enacted the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA), which instituted an income screen and procedural barriers that made filing more difficult and expensive.

The number of filings spiked in mid-2005 in anticipation of the new law, then plummeted. Since then, filings have increased each quarter. They are likely to exceed one million households in 2008, representing about 2.7 million people.

BAPCPA's effects appear nonselective. Current filers differ from past ones mainly in having struggled longer with their debts.[7] New restrictions fall equally on medical and nonmedical bankruptcies, with no preferences for medical debts or sick debtors. It is implausible to ascribe the growing predominance of medical causes of bankruptcy to BAPCPA.

Conversely, there is ample evidence that the financial burden of illness is increasing. The number of under-insured increased from 15.6 million in 2003 to 25.2 million in 2007.[3] Of low- and middle-income households with credit card balances, 29% use credit card borrowing to pay off medical expenses over time.[8] Collection agencies contacted 37.2 million Americans about medical bills in 2003.[9] Between 2005 and 2007, the proportion of nonelderly adults reporting medical debts or problems paying medical bills rose from 34% to 41%.[10]

Adding to Other Studies

We have reviewed elsewhere the older studies on medical bankruptcy.[2,11] Most rely exclusively on court records where many medical debts are invisible, disguised as credit card debt or mortgages. In our cohort, most medical debtors had charged unaffordable medical care to credit cards.

Similarly, debts turned over to collection agencies by doctors or hospitals may be unrecognizable on court records. Moreover, income loss due to illness cannot be identified. In short, even though such studies find substantial rates of medical bankruptcy,[12,13] estimates based solely on court records understate medical bankruptcies.[9]

Population-based studies also are problematic because many debtors are unwilling to admit to filing. Thus, a study based on the Panel Survey of Income Dynamics could identify only 74 bankruptcies (0.4% of respondents), half the actual filing rate among the national population from which the sample was drawn.[13]

A few studies employed novel methods to analyze medical bankruptcy. One found a high bankruptcy filing rate in a cohort of patients with serious neurologic injuries.[14] A survey of cancer patients documented a 3% bankruptcy rate; 7% had taken a second mortgage to pay for treatments.[15] A questionnaire-based study found medical contributors to 61% of Utah bankruptcies; 58% of families seeking help at bankruptcy clinics in upstate New York reported outstanding medical debts.[16]

Medical impoverishment, although common in poor nations,[17,18] is almost unheard of in wealthy countries other than the US.[19] Most provide a stronger safety net of disability income support. All have some form of national health insurance.

The US health care financing system is broken, and not only for the poor and uninsured. Middle-class families fre-

quently collapse under the strain of a health care system that treats physical wounds, but often inflicts fiscal ones.

References

1. Sullivan TA, Warren E, Westbrook JL. *The Fragile Middle Class: Americans in Debt*. New Haven, CT: Yale University Press; 2000.
2. Himmelstein DU, Warren E, Thorne D, Woolhandler S. Illness and injury as contributors to bankruptcy. *Health Aff (Millwood)*. February 2, 2005 [Web exclusive]. Available at: http://content.healthaffairs.org/cgi/reprint/hlthaff.w5.63v1. Accessed August 6, 2008.
3. Schoen C, Collins SR, Kriss JL, Doty MM. How many are underinsured? Trends among U.S. adults, 2003 and 2007. *Health Aff (Millwood)*. June 10, 2008 [Web exclusive: w298-w309]. Available at: http://content.healthaffairs.org/cgi/reprint/hlthaff.27.4.w298v1?ijkey=rhRn2Tr4HAKZ.&keytype=ref&siteid=healthaff. Accessed August 6, 2008.
4. Bankruptcy Abuse Prevention and Consumer Protection Act of 2005, Public Law No. 109-8, 119 Stat. 23 (2005).
5. NORC (National Opinion Research Center). Occupational Prestige/Summary. Available at: http://cloud9.norc.uchicago.edu/faqs/prestige.htm. Accessed July 23, 2008.
6. Pereira J. Left behind—casualties of a changing job market; parting shot: to save on health-care costs, firms fire disabled workers. *Wall Street Journal*. July 14, 2003:A1.
7. Lawless RM, Littwin AK, Porter KM, et al. Did bankruptcy reform fail? An empirical study of consumer debtors. *Am Bankruptcy Law J*. 2008;82:349-405.
8. Zeldin C, Rukavina M. Borrowing to stay healthy: how credit card debt is related to medical expenses. The Access Project and Demos, 2007. Available at: http://www.accessproject.org/adobe/borrowing_to_stay_healthy.pdf. Accessed July 18, 2008.
9. Doty MM, Edwards JN, Holgren AL. Seeing red: Americans driven into debt by medical bills. *Commonwealth Fund*. August 10, 2005. Available at: http://www.commonwealthfund.org/usr_doc/837_Doty_seeing_red_medical_debt.pdf?section=4039. Accessed July 17, 2008.
10. The Commonwealth Fund Commission on a High Performance Health System. Why not the best? Results from the National Scorecard on U.S. Health System Performance, 2008. *The Commonwealth Fund*. 2008. Available at: http://www.commonwealthfund.org/usr_doc/Why_Not_the_Best_national_scorecard_2008.pdf?section=4039. Accessed July 17, 2008.
11. Himmelstein DU, Warren E, Thorne D, Woolhandler S. Discounting the debtors will not make medical bankruptcy disappear. *Health Aff (Millwood)*. 2006;25:W84-W88.
12. Zhu N. Household consumption and personal bankruptcy. Social Science Research Network. February 2007. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=971134. Accessed July 16, 2008.
13. Mathur A. Medical bills and bankruptcy filings. American Enterprise Institute. July 2006. Available at: http://www.aei.org/docLib/20060719_MedicalBillsAndBankruptcy.pdf. Accessed July 16, 2008.
14. Hollingworth W, Relyea-Chew A, Comstock BA, et al. The risk of bankruptcy before and after brain or spinal cord injury: a glimpse at the iceberg's tip. *Med Care*. 2007;45:702-711.
15. *USA Today*, Kaiser Family Foundation, and Harvard School of Public Health National Survey of Households Affected by Cancer (November 2006). Available at: http://kff.org/upload/7590.pdf.
16. de Jung T. *A Review of Medical Debt in Upstate New York*. Albany, NY: Empire Justice Center; 2006.
17. Xu K, Evans D, Carrin G, et al. Protecting households from catastrophic health spending. *Health Aff (Millwood)*. 2007;26:972-983.
18. Raccanello K, Anand J, Dolores EGB. Pawning for financing health expenditures: do health shocks increase the probability of losing the pledge? In: Wood D, ed. *The Economics of Health and Wellness: Anthropologic Perspectives*. Oxford, UK: Elsevier; 2008.
19. Reid TR. Interviews with leading health policy experts in several nations. Available at: http://www.pbs.org/wgbh/pages/frontline/sickaroundtheworld/interviews/. Accessed July 18, 2008.

Medical Bankruptcy – Q&A

David U. Himmelstein, M.D., Deborah Thorne, Ph.D., Elizabeth Warren, J.D., Steffie Woolhandler, M.D., M.P.H.

1- What is a "medical bankruptcy"?

A number of medical factors can contribute to a family's financial collapse, including high medical bills or lost time from work. Because different researchers use different definitions, we supplied a detailed analysis of debtors who:

- Specifically identified medical problem of the debtor or spouse (32.1%) or another family member (10.8%) as a reason for filing bankruptcy.
- Specifically said medical bills were a reason for bankruptcy. (29.0%)
- Lost two or more weeks of wages because of lost time from work to deal with a medical problem for themselves or a family member. (40.3%)
- Mortgaged their homes to pay medical bills. (5.7%)
- Spent more than $5,000 or 10% of annual household income in out-of-pocket medical bills (34.7%)

- Total, one or more of the above criteria: 62.1%

The vast majority (92%) of bankruptcies that we classified as medical had medical bill problems as indicated by: listing medical bills as a specific reason for their bankruptcy; or having medical bills of bills $5,000 or 10% of household income or that forced them to mortgage their home. The remaining 8% whose bankruptcy was classified as "medical" indicated that a medical problem or income loss due to illness was a cause of bankruptcy.

2- Why do only 29% of bankrupt people identify medical bills as a reason for filing bankruptcy, but you say the total percentage of medical bankruptcies is 62.1%?

Families characterize their problems differently. Someone may mortgage a home to pay for surgery, then be unable to pay off the mortgage, describing the reason for filing bankruptcy as "unable to pay the mortgage." Similarly, some people explain that they have lost too much time from work when they have taken off to care for a child who has been hospitalized. We believe that multiple ways of asking about medical bankruptcies give the most complete picture, but we publish the breakdown in responses so that any other research or commentator can draw his or her own conclusions.

Finally, it should be noted that many people who are financially ruined by illness are undoubtedly too ill, too poor or demoralized to pursue formal bankruptcy, and are not counted in our study.

3- What is the impact of health insurance?

More than three-quarters (78%) of the families that met the criteria for medical bankruptcy had health insurance at the onset of their illness or accident. By comparison, 80% of the non-elderly adult population and 85% of the entire U.S. population had health insurance in 2007. Hence, it appears that health insurance offers only modest protection against medical bankruptcy.

4- Is the problem of medical bankruptcies just because of the recession?

No. The families in this study filed for bankruptcy between January-April of 2007, before the recession began. Since then, the financial stress on families has grown.

5- Is this a national sample of all families filing for bankruptcy?

Yes. The sample was drawn from bankruptcy filings across the country.

6- How did you get your information?

We contacted a random sample of all personal bankruptcy filers in the U.S. during the winter of 2007. Written questionnaires were returned by 2,314 debtors, and we also analyzed their bankruptcy court records. We also carried out extensive telephone interviews with 1,032 of these debtors.

Finally, to be sure that the debtors who returned our survey were similar to those who did not, we also analyzed the court records of 99 of the non-respondents. They were almost identical to those who returned the survey in terms of debts, income, assets and other characteristics.

7- What's the basis for saying that the proportion of bankruptcies that are medical rose by 50% between 2001 and 2007?

In order to compare the medical bankruptcy rates in 2007 and in our 2001 study we had to use the same definitions in both years. Our 2001 study had used a less stringent ("legacy") definition of medical bankruptcy that included families with more than $1000 in unpaid medical bills. Using this "legacy" definition, the medical bankruptcy rate rose from 46.2% in 2001 to 69.1% in 2007 – a 49.6% increase. The 2001 estimate relied on data collected from bankruptcy filers in five states. Analysis of the 2007 data confirmed that the five states included in the 2001 survey also saw a 50% increase in medical bankruptcies.

8- Would health reform eliminate the problem of medical bankruptcy?

Many debtors described a complex web of problems involving illness, work, and family. Separating medical from other causes of bankruptcy is difficult. Hence, we cannot presume that eliminating the medical antecedents of bankruptcy would have prevented all of the filings we classified as "medical bankruptcies." The high rate of insurance among the medical bankrupts suggests that any health reform that fails to improve existing private coverage is unlikely to make a major impact on medical bankruptcy. Moreover, our data also highlight the need for improved disability coverage.

9- Why do some others claim that medical bankruptcy rates are much lower?

Ours is the only study based on direct surveys and interviews with a large sample of families filing for bankruptcy. Others have based their findings on bankruptcy court records alone (with no direct surveys or interviews) or on surveys of the general public that inquire about bankruptcy filings. Court records fail to identify medical bankruptcies because many medical bills are charged to credit cards and hence cannot be identified as "medical" in court records. Similarly, when medical providers turn debts over to collection agencies they would not appear as "medical." Because bankruptcy carries a substantial stigma, about half of all respondents who are bankrupt deny that fact. As a result, surveys of the general public are an unreliable source of information on medical bankruptcy. For these reasons, the only way to accurately assess medical bankruptcy is to directly survey families who file for bankruptcy.

Talking Point 2

The uninsured do not receive all the medical care they need: 45,000 die annually, and one-third of uninsured adults have a chronic illness and don't receive needed care.

"Under my proposed health plan, those who can afford medical care will pay their bills and those who can't will remain sick."

Health Insurance and Mortality in US Adults

| Andrew P. Wilper, MD, MPH, Steffie Woolhandler, MD, MPH, Karen E. Lasser, MD, MPH, Danny McCormick, MD, MPH, David H. Bor, MD, and David U. Himmelstein, MD

The United States stands alone among industrialized nations in not providing health coverage to all of its citizens. Currently, 46 million Americans lack health coverage.[1] Despite repeated attempts to expand health insurance, uninsurance remains commonplace among US adults.

Health insurance facilitates access to health care services and helps protect against the high costs of catastrophic illness. Relative to the uninsured, insured Americans are more likely to obtain recommended screening and care for chronic conditions[2] and are less likely to suffer undiagnosed chronic conditions[3] or to receive substandard medical care.[4]

Numerous investigators have found an association between uninsurance and death.[5–14] The Institute of Medicine (IOM) estimated that 18 314 Americans aged between 25 and 64 years die annually because of lack of health insurance, comparable to deaths because of diabetes, stroke, or homicide in 2001 among persons aged 25 to 64 years.[4] The IOM estimate was largely based on a single study by Franks et al.[5] However, these data are now more than 20 years old; both medical therapeutics and the demography of the uninsured have changed in the interim.

We analyzed data from the Third National Health and Nutrition Examination Survey (NHANES III). NHANES III collected data on a representative sample of Americans, with vital status follow-up through 2000. Our objective was to evaluate the relationship between uninsurance and death.

METHODS

The National Center for Health Statistics (NCHS) conducted NHANES III between 1988 and 1994. The survey combined an interview, physical examination, and laboratory testing. NHANES III employed a complex sampling design to establish national estimates of disease prevalence among the

Objectives. A 1993 study found a 25% higher risk of death among uninsured compared with privately insured adults. We analyzed the relationship between uninsurance and death with more recent data.

Methods. We conducted a survival analysis with data from the Third National Health and Nutrition Examination Survey. We analyzed participants aged 17 to 64 years to determine whether uninsurance at the time of interview predicted death.

Results. Among all participants, 3.1% (95% confidence interval [CI]=2.5%, 3.7%) died. The hazard ratio for mortality among the uninsured compared with the insured, with adjustment for age and gender only, was 1.80 (95% CI=1.44, 2.26). After additional adjustment for race/ethnicity, income, education, self- and physician-rated health status, body mass index, leisure exercise, smoking, and regular alcohol use, the uninsured were more likely to die (hazard ratio=1.40; 95% CI=1.06, 1.84) than those with insurance.

Conclusions. Uninsurance is associated with mortality. The strength of that association appears similar to that from a study that evaluated data from the mid-1980s, despite changes in medical therapeutics and the demography of the uninsured since that time. (*Am J Public Health.* 2009;99:2289–2295. doi:10.2105/AJPH.2008.157685)

noninstitutionalized civilian population in the United States.[15] Staff performed interviews in English and Spanish.

The NHANES III Linked Mortality File matched NHANES III records to the National Death Index (NDI). The NCHS's linkage, which uses a probabilistic matching strategy through December 31, 2000, is described elsewhere.[16] The NCHS perturbed the file to prevent reidentification of survey participants. Vital status was not altered in this process. The publicly released data yield survival analysis results virtually identical to the restricted-use NHANES III Linked Mortality File.[17]

In designing our analysis, we hewed closely to Franks'[5] methodology to facilitate interpretation of time trends. We analyzed data for individuals who reported no public source of health insurance at the time of the NHANES III interview. First, we excluded those aged older than 64 years, as virtually all are eligible for Medicare. Of the 33 994 individuals participating, 14 798 were aged between 17 and 64 years at the time of the interview. In keeping with earlier analyses,[5–7,13] we also excluded nonelderly Medicare recipients and persons covered by Medicaid and the Department of Veterans

Affairs/Civilian Health and Medical Program of the Uniformed Services military insurance (n=2023), as a substantial proportion of those individuals had poor health status as a prerequisite for coverage. Of the 12 775 participants not covered by government insurance, we excluded 663 (5.2%) who lacked information on health insurance. We excluded 974 of the remaining 12 112 who were covered by private insurance or uninsured at the time of the interview because of failure to complete the interview and physical examination. Of the remaining 11 138, we included only the 9005 with complete baseline data from both the interview and physical examination in our final analysis (Figure 1). Among those with complete insurance data, those with complete interview and examination data were both less likely to be uninsured (16.4% vs 21.6%; *P*<.001) and less likely to die (3.0% vs 4.5%; *P*<.001).

NHANES III staff interviewed respondents in their homes regarding demographics (including health insurance). Participants responded to questions about race, ethnicity, income, and household size. The sample design permits estimation for 3 racial/ethnic groups: non-Hispanic White, non-Hispanic Black, and
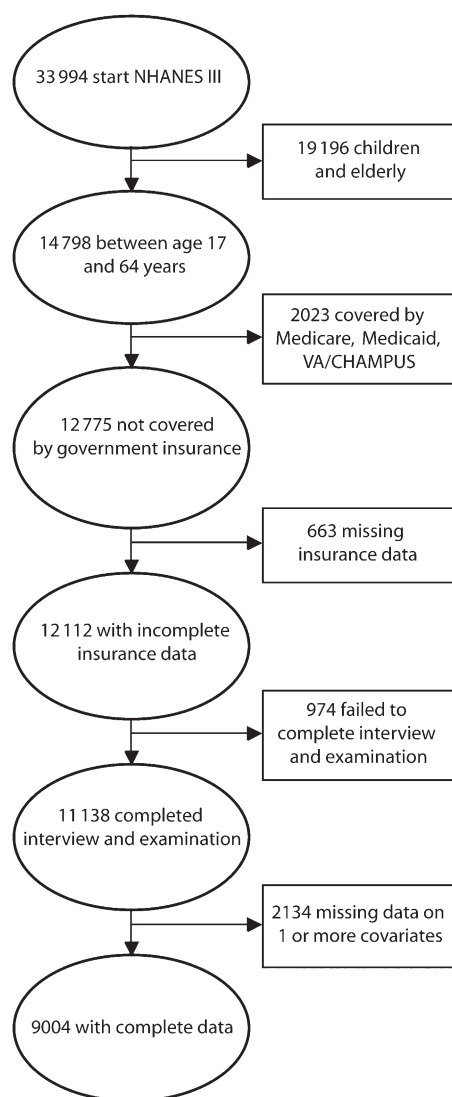
Note. NHANES III = National Health and Nutrition Examination Survey; VA/CHAMPUS = Veterans Affairs/Civilian Health and Medical Program of the Uniformed Services.

FIGURE 1—Study population and exclusions.

Mexican American. The NCHS created a variable that combined family income and the poverty threshold during the year of interview (the poverty income ratio), allowing income to be standardized for family size and compared across the 6 years of data collection.[18]

NHANES III interviewers also collected data on education, employment, tobacco use, alcohol use, and leisure exercise. We analyzed education dichotomously, comparing those with 12 years or more education to those with less than 12 years. We considered

respondents to be unemployed if they were looking for work, laid off, or unemployed. All others, including the employed, students, homemakers, and retirees were considered "not unemployed." We considered smokers in 3 categories: current smokers, former smokers (those who had smoked more than 200 cigarettes in their lifetime), and nonsmokers. We labeled those drinking more than 6 alcoholic beverages per week as regular drinkers. We analyzed exercise in 2 groups: those achieving greater than or equal to 100

metabolic equivalents (METs) per month, versus those achieving less than 100 METs per month.[19,20]

NHANES III measured participants' self-perceived health in 5 categories: excellent, very good, good, fair, and poor. We combined the last 2 groups because of small numbers. NHANES physicians performed physical examinations on all participants and provided an impression of overall health status rated as excellent, very good, good, fair, and poor.[21] We combined the final 2 groups because of small numbers. We analyzed body mass index (BMI; weight in kilograms divided by height in meters squared) in 4 categories: less than 18.5; 18.5 to 25; more than 25 to less than 30; and 30 and higher.

NHANES III oversampled several groups, including Black persons, Mexican Americans, the very young (aged 2 months to 5 years), and those aged older than 65 years. To account for this and other design variables we used the SUDAAN (version 9.1.3, Research Triangle Institute, Research Triangle Park, NC) SURVIVAL procedure and SAS (version 9.1, SAS Institute Inc, Cary, NC) PROC SURVEYFREQ to perform all analyses. We (as did Franks et al.[5]) employed unweighted survival analyses and controlled for the variables used in determining the sampling weights (age, gender, and race/ethnicity) because of the inefficiency of weighted regression analyses.[22]

We analyzed the relation between insurance, demographics, baseline health status variables, and mortality by using χ^2 tests. We then used a Cox proportional hazards survival analysis controlling only for age and gender to determine if lack of health insurance predicted mortality. We repeated the analysis of the relationship of insurance to mortality after forcing all covariates in the model. In this Cox proportional hazards analysis, we controlled for gender, age, race/ethnicity (4 categories), income (poverty income ratio), education, current unemployment, smoking status (3 categories), regular alcohol use, self-rated health (4 categories), physician-rated health (4 categories), and BMI (4 categories). We tested for significant interactions between these variables and health insurance status (i.e., $P<.05$). We handled tied failure times by using the Efron method.

We performed multiple sensitivity analyses to analyze the robustness of our results.

38

We developed a propensity score model and controlled for the variables in our previous models (with the exception of health insurance status), as well as marital status; household size; census region; number of overnight visits in hospital in past 12 months; number of visits to a physician in past 12 months; limitations in work or activities; job or housework changes or job cessation because of a disability or health problem; and number of self-reported chronic diseases, including emphysema, prior nonskin malignancy, stroke, congestive heart failure, hypertension, diabetes, or hypercholesterolemia. Next, we included the propensity score in the multivariable model with the indicator for insurance status. In addition, we tested for the effect of including those covered by Medicaid by using our original Cox model and the propensity score adjusted analysis. In a subsidiary analysis, we excluded employment and self- and physician-rated health, as these covariates may be a result of limited access to health care because of uninsurance.

To facilitate interpretation of our hazard ratio, we first replicated the calculation in the IOM report to estimate the number of US adults who die annually because of lack of health insurance. This approach applies the overall hazard ratio to 9-year age strata and sums these figures to arrive at an annual number of deaths attributable to lack of health insurance. We then recalculated this figure by using the slightly different approach utilized by the Urban Institute, which does not age stratify when calculating total mortality. We believe this approach to be more accurate than that used to produce the IOM estimate, as it calculates mortality from the entire age range that the hazard ratio was calculated from, as opposed to calculating mortality over 10-year age strata.[23]

RESULTS

We display baseline characteristics of the sample in Table 1; 9004 individuals contributed 80 657 person-years of follow-up time between 1988 and 2000. Of these, 16.2% (95% confidence interval [CI]=14.1%, 18.2%) were uninsured at the time of interview.

TABLE 1—Insurance and Mortality Among Nonelderly US Adults Aged 17 to 64 Years: NHANES III (1986–1994) With Follow-Up Through 2000

Characteristic	No. (weighted %)	% Uninsured (SE)	% Died (SE)
Vital status as of December 31, 2000			
Alive	8653 (96.9)	16.2 (1.0)	0
Deceased	351 (3.1)	17.2 (2.8)	100
Insurance status[a]			
Privately insured	6655 (83.8)	0	3.0 (0.3)
Uninsured	2350 (16.2)	100	3.3 (0.6)
Gender			
Female	4695 (50.2)	15.1 (1.1)	2.6 (0.3)
Male	4311 (49.8)	17.3 (1.3)	3.5 (0.4)
Age, y			
17–24	1750 (17.1)	28.5 (2.5)	0.7 (0.2)
25–34	2338 (27.1)	19.7 (1.5)	1.4 (0.4)
35–44	2177 (26.2)	11.6 (1.2)	1.7 (0.3)
45–54	1529 (16.8)	10.8 (1.4)	5.1 (0.9)
55–64	1344 (12.7)	8.9 (1.4)	10.7 (1.1)
Race/ethnicity			
Non-Hispanic White	3484 (78.1)	12.3 (0.8)	3.1 (0.4)
Non-Hispanic Black	2567 (9.9)	22.6 (2.1)	4.1 (0.5)
Mexican American	2598 (5.1)	45.5 (1.9)	3.1 (0.4)
Other	355 (6.9)	29.5 (7.3)	0.9 (0.4)
Education, y			
<12	2917 (19.6)	37.4 (3.0)	4.1 (0.5)
≥12	6087 (80.4)	11.0 (0.7)	2.8 (0.3)
Employment			
Unemployed[b]	511 (4.0)	49.8 (3.9)	5.3 (1.3)
All others	8493 (96.0)	14.8 (0.9)	3.0 (0.3)
Poverty income ratio[c]			
0–1	1678 (9.2)	56.2 (2.7)	4.3 (0.9)
>1–3	4171 (39.7)	22.1 (1.7)	3.0 (0.3)
>3	3155 (51.2)	4.4 (0.5)	3.0 (0.4)
Smoking status			
Current smoker	2465 (29.1)	22.8 (1.8)	4.6 (0.5)
Former smoker[d]	1794 (22.3)	10.4 (1.1)	4.2 (0.7)
Nonsmoker	4745 (48.6)	14.9 (1.1)	1.7 (0.3)
Drinking status, alcoholic drinks/wk			
<6	7193 (78.3)	15.3 (1.1)	4.3 (0.7)
≥6	1811 (21.7)	19.6 (1.5)	2.8 (0.4)
Exercise, METs/mo			
≥100	3475 (42.0)	13.7 (1.1)	2.9 (0.4)
<100	5529 (58.0)	18.0 (1.1)	3.2 (0.4)
Self-rated health			
Excellent	1675 (23.4)	9.3 (1.3)	2.0 (0.4)
Very good	2499 (34.9)	12.0 (0.9)	1.4 (0.4)
Good	3288 (31.7)	20.5 (1.9)	3.3 (0.4)
Fair or poor	1542 (9.9)	33.6 (2.5)	10.8 (1.2)

Continued

TABLE 1—Continued

Physician-rated health on examination			
Excellent	4627 (54.2)	16.8 (1.2)	1.8 (0.3)
Very good	2179 (24.4)	13.3 (1.2)	2.6 (0.5)
Good	1858 (18.4)	17.2 (1.4)	4.9 (0.7)
Fair or poor	340 (3.0)	21.7 (4.8)	19.0 (2.6)
Measured BMI			
<18.5	205 (2.7)	19.8 (4.0)	4.0 (1.4)
18.5–25	3764 (46.8)	16.4 (1.2)	2.4 (0.3)
>25–<30	2853 (30.4)	14.9 (1.2)	3.3 (0.7)
≥30	2182 (20.0)	17.2 (1.8)	4.3 (0.8)

Notes. BMI = body mass index (weight in kg divided by height in meters squared); METs = metabolic equivalents; NHANES = National Health and Nutrition Examination Survey.
[a]For those with complete data for all characteristics; excludes those covered by any government insurance.
[b]Looking for work, laid off, or unemployed.
[c]Combines family income, poverty threshold, and year of survey to allow analysis of income data across the 6 years of NHANES III; less than 1 indicates less than the poverty threshold.
[d]Smoked more than 200 cigarettes in lifetime.

Uninsurance was associated with younger age, minority race/ethnicity, unemployment, smoking, exercise (less than 100 METs per month), self-rated health, and lower levels of education and income ($P<.001$ for all comparisons). Regular alcohol use and physician-rated health were also associated with higher rates of uninsurance ($P<.05$ for both comparisons).

By the end of follow-up in 2000, 351 individuals, or 3.1% (95% CI = 2.5%, 3.7%) of the sample, had died (Table 1). Significant bivariate predictors of mortality included male gender ($P=.04$), age ($P<.001$), minority race/ethnicity ($P<.001$), less than 12 years of education ($P=.008$), unemployment ($P=.02$), smoking ($P<.001$), regular alcohol use ($P=.04$), worse self-rated health status ($P<.001$), and worse physician-rated health status ($P<.001$).

In the model adjusted only for age and gender, lack of health insurance was significantly associated with mortality (hazard ratio [HR] = 1.80; 95% CI = 1.44, 2.26). In subsequent models adjusted for gender, age, race/ethnicity, poverty income ratio, education, unemployment, smoking, regular alcohol use, self-rated health, physician-rated health, and BMI, lack of health insurance significantly increased the risk of mortality (HR = 1.40; 95% CI = 1.06, 1.84; Table 2). We detected no significant interactions between lack of health insurance and any other variables. Our sensitivity analyses yielded substantially similar estimates.

Replicating the methods of the IOM panel with updated census data[24,25] and this hazard ratio, we calculated 27 424 deaths among Americans aged 25 to 64 years in 2000 associated with lack of health insurance. Applying this hazard ratio to census data from 2005[26] and including all persons aged 18 to 64 years yields an estimated 35 327 deaths annually among the nonelderly associated with lack of health insurance. When we repeated this approach without age stratification, (thought by investigators at the Urban Institute to be an overly conservative approach)[23] we calculated approximately 44 789 deaths among Americans aged 18 to 64 years in 2005 associated with lack of health insurance.

DISCUSSION

The uninsured are more likely to die than are the privately insured. We used a nationally representative data set to update the oft-cited study by Franks et al. and demonstrate the persistence of increased mortality attributable to uninsurance. Our findings are in accord with earlier research showing that lack of health insurance increases the likelihood of death in select illnesses and populations.[5–7,13] Our estimate for annual deaths attributable to

uninsurance among working-age Americans is more than 140% larger than the IOM's earlier figure.[23]

By using methodologies similar to those used in the 1993 study, we found that being uninsured is associated with a similar hazard for mortality (1.40 for our study vs 1.25 for the 1993 study). Although the NHANES I study methodology and population were similar to those used in NHANES III, differences exist. The population analyzed in the original study was older on average than were participants in our sample (22.8% vs 55.6% aged 34 years or younger). The maximum length of follow-up was less (16 years vs 12 years), and the earlier analysis was limited to White and Black persons, whereas the present study also includes Mexican Americans.

The relative youthfulness and shorter follow-up in our study population would be expected to reduce our power to detect an elevated risk of death. In addition, if gaining Medicare reduces the effect of uninsurance on mortality, then the younger age and shorter length of follow-up in our study might strengthen the association between uninsurance and mortality compared with the earlier study. It is less clear how the differences in the racial and ethnic make-up of our study population would affect our ability to detect difference in risk of death. In fact, the increased likelihood of uninsurance among Mexican Americans who were nonetheless no more likely to die than non-Hispanic Whites might also be expected to reduce our power compared with the earlier study.

The original analysis confirmed vital status by review of decedents' death certificates. The NCHS had developed a probabilistic matching strategy to establish vital status. A subsample underwent death certificate review and verification; 98.7% were found to be correctly classified following this review.[16] Again, it is not clear how any misclassification would bias our results. Moreover, Congress extended Medicare coverage in 1972 to 2 nonelderly groups: the long-term disabled and those with end-stage renal disease.[27] So, although both studies excluded Medicare enrollees, only ours entirely excluded disabled nonelderly adults who are at particularly high risk of death.

TABLE 2—Adjusted Hazards for Mortality Among US Adults Aged 17 to 64 Years: NHANES III, 1988–2000

Characteristic	Hazards Ratio (95% CI)
Insurance status	
Privately insured[a] (Ref)	1.00
Uninsured	1.40 (1.06, 1.84)
Age[b]	1.06 (1.05, 1.07)
Gender	
Female (Ref)	1.00
Male	1.37 (1.13, 1.68)
Race/ethnicity	
Non-Hispanic White (Ref)	1.00
Non-Hispanic Black	1.32 (0.98, 1.79)
Mexican American	0.88 (0.64, 1.19)
Other	0.46 (0.24, 0.90)
Exercise, METs/mo	
≥100 (Ref)	1.00
<100	1.05 (0.80, 1.38)
Smoking status	
Nonsmoker (Ref)	1.00
Current smoker	2.02 (1.43, 2.85)
Former smoker[c]	1.42 (1.09, 1.85)
Drinking status, alcoholic drinks/wk	
<6 (Ref)	1.00
≥6	1.38 (0.99, 1.92)
Education, y	
≥12 (Ref)	1.00
<12	0.98 (0.75, 1.27)
Employment	
Not unemployed[d] (Ref)	1.00
Unemployed	1.40 (0.92, 2.14)
Self-rated health	
Excellent (Ref)	1.00
Very good	0.67 (0.42, 1.09)
Good	1.27 (0.84, 1.90)
Fair or poor	2.26 (1.40, 3.64)
Physician-rated health	
Excellent (Ref)	1.00
Very good	0.99 (0.77, 1.27)
Good	1.17 (0.90, 1.52)
Fair or poor	3.22 (2.26, 4.58)
Measured BMI	
<18.5	1.26 (0.69, 2.29)
18.5–25 (Ref)	1.00

Continued

TABLE 2—*Continued*

>25–<30	0.87 (0.66, 1.15)
≥30	0.89 (0.69, 1.15)
Poverty income ratio[e]	1.03 (0.95, 1.12)

Notes. BMI = body mass index (weight in kg divided by height in meters squared); CI = confidence interval; METs = metabolic equivalents.
[a]For those with complete data for all characteristics; excludes those covered by any government insurance.
[b]Hazard ratio reflects risk for every 1-year increase in age.
[c]Smoked more than 200 cigarettes in lifetime.
[d]Looking for work, laid off, or unemployed.
[e]Combines family income, poverty threshold, and year of survey to allow analysis of income data across the 6 years of NHANES III; less than 1 indicates less than the poverty threshold. Entered into regression model as a continuous variable. Hazard ratio represents change for every 1 unit increase in the poverty income ratio.

The mechanisms by which health insurance affects mortality have been extensively studied. Indeed, the IOM issued an extensive report summarizing this evidence.[29] The IOM identified 3 mechanisms by which insurance improves health: getting care when needed, having a regular source of care, and continuity of coverage.

The uninsured are more likely to go without needed care than the insured. For instance, Lurie et al. demonstrated that among a medically indigent population in California, loss of government-sponsored insurance was associated with decreased use of physician services and worsening control of hypertension.[28,29] The uninsured are also more likely to visit the emergency department[30] and be admitted to the hospital[31] for "ambulatory care sensitive conditions," suggesting that preventable illnesses are a consequence of uninsurance.

The chronically ill uninsured are also less likely to have a usual source of medical care,[32] decreasing their likelihood of receiving preventative and primary care. Discontinuity of insurance is also harmful; those intermittently uninsured are more likely to die than the insured.[13]

All of these factors likely play a role in the decline in health among middle-aged uninsured persons detected by Baker et al.[33,34] This trend appears to reverse at age 65, when the majority gains access to Medicare coverage.[35] Other studies suggest that extending health

insurance not only improves health, but also may be cost effective.[36]

Limitations

Our study has several limitations. NHANES III assessed health insurance at a single point in time and did not validate self-reported insurance status. We were unable to measure the effect of gaining or losing coverage after the interview. Point-in-time uninsurance is associated with subsequent uninsurance.[6] Intermittent insurance coverage is common and accelerates the decline in health among middle-aged persons.[33] Among the near-elderly, point-in-time uninsurance was associated with significant decline in overall health relative to those with private insurance.[13] Earlier population-based surveys that did validate insurance status found that between 7% and 11% of those initially recorded as being uninsured were misclassified.[13] If present, such misclassification might dilute the true effect of uninsurance in our sample. We excluded 29.5% of the sample because of missing data. These individuals were more likely to be uninsured and to die, which might also bias our estimate toward the null.

We have no information about duration of insurance coverage from this survey. Further, we have no data regarding cost sharing (out-of-pocket expenses) among the insured; cost sharing worsened blood pressure control among the poor in the RAND Health Insurance Experiment, and was associated with decreased use of essential medications, and increased rates of emergency department use and adverse events in a random sample of elderly and poor Canadians.[37,38]

Unmeasured characteristics (i.e., that individuals who place less value on health eschew both health insurance and healthy behaviors) might offer an alternative explanation for our findings. However, our analysis controlled for tobacco and alcohol use, along with obesity and exercise habits. In addition, research has found that more than 90% of nonelderly adults without insurance cite cost or lack of employer-sponsored coverage as reasons for being uninsured, whereas only 1% percent report "not needing" insurance.[39] In fact, the variables included in our main survival analysis may inappropriately diminish the relationship between

insurance and death. For example, poor physician-rated health, poor self-rated health, and unemployment may result from medically preventable conditions. Indeed, earlier analyses suggest that the true effect of uninsurance is likely larger than that measured in multivariate models.[13,40] In addition, Hadley found that accounting for endogeneity bias by using an instrumental variable increases the protective effect of health insurance on mortality.[40]

Conclusions

Lack of health insurance is associated with as many as 44 789 deaths per year in the United States, more than those caused by kidney disease (n=42 868).[41] The increased risk of death attributable to uninsurance suggests that alternative measures of access to medical care for the uninsured, such as community health centers, do not provide the protection of private health insurance. Despite widespread acknowledgment that enacting universal coverage would be life saving, doing so remains politically thorny. Now that health reform is again on the political agenda, health professionals have the opportunity to advocate universal coverage. ∎

About the Authors

At the time of this research, all authors were with the Department of Medicine at Cambridge Health Alliance, affiliated with Harvard Medical School, Cambridge, MA.

Correspondence should be sent to Andrew P. Wilper, MD, MPH, Veterans Affairs Medical Center, 500 W Fort St, Boise, ID 83702 (e-mail: wilp9522@u.washington.edu). Reprints can be ordered at http://www.ajph.org by clicking the "Reprints/Eprints" link.

This article was accepted on March 16, 2009.

Human Participant Protection

The institutional review board of Cambridge Health Alliance deemed this study exempt from formal review.

References

1. US Census Bureau. Income, poverty, and health insurance coverage in the United States: 2007. Available at: http://www.census.gov/prod/2008pubs/p60-235.pdf. Accessed August 29, 2008.

2. Ayanian JZ, Weissman JS, Schneider EC, Ginsburg JA, Zaslavsky AM. Unmet health needs of uninsured adults in the United States. *JAMA.* 2000;284:2061–2069.

3. Ayanian JZ, Zaslavsky AM, Weissman JS, Schneider EC, Ginsburg JA. Undiagnosed hypertension and hypercholesterolemia among uninsured and insured adults in the Third National Health and Nutrition Examination Survey. *Am J Public Health.* 2003;93:2051–2054.

4. Institute of Medicine. *Care Without Coverage, Too Little, Too Late.* Washington, DC: The National Academies Press; 2002.

5. Franks P, Clancy CM, Gold MR. Health insurance and mortality. Evidence from a national cohort. *JAMA.* 1993;270:737–741.

6. McWilliams JM, Zaslavsky AM, Meara E, Ayanian JZ. Health insurance coverage and mortality among the near-elderly. *Health Aff (Millwood).* 2004;23:223–233.

7. Sorlie PD, Johnson NJ, Backlund E, Bradham DD. Mortality in the uninsured compared with that in persons with public and private health insurance. *Arch Intern Med.* 1994;154:2409–2416.

8. Bennett CL, Horner RD, Weinstein RA, et al. Racial differences in care among hospitalized patients with Pneumocystis carinii pneumonia in Chicago, New York, Los Angeles, Miami, and Raleigh-Durham. *Arch Intern Med.* 1995;155:1586–1592.

9. Ayanian JZ, Kohler BA, Abe T, Epstein AM. The relation between health insurance coverage and clinical outcomes among women with breast cancer. *N Engl J Med.* 1993;329:326–331.

10. Roetzheim RG, Gonzalez EC, Ferrante JM, Pal N, Van Durme DJ, Krischer JP. Effects of health insurance and race on breast carcinoma treatments and outcomes. *Cancer.* 2000;89:2202–2213.

11. Roetzheim RG, Pal N, Gonzalez EC, Ferrante JM, Van Durme DJ, Krischer JP. Effects of health insurance and race on colorectal cancer treatments and outcomes. *Am J Public Health.* 2000;90:1746–1754.

12. Canto JG, Rogers WJ, French WJ, Gore JM, Chandra NC, Barron HV. Payer status and the utilization of hospital resources in acute myocardial infarction: a report from the National Registry of Myocardial Infarction 2. *Arch Intern Med.* 2000;160:817–823.

13. Baker DW, Sudano JJ, Durazo-Arvizu R, Feinglass J, Witt WP, Thompson J. Health insurance coverage and the risk of decline in overall health and death among the near elderly, 1992-2002. *Med Care.* 2006;44:277–282.

14. Bhattacharya J, Goldman D, Sood N. The link between public and private insurance and HIV-related mortality. *J Health Econ.* 2003;22:1105–1122.

15. Centers for Disease Control and Prevention. National Health and Nutrition Examination III data files, documentation, and SAS code. Available at: http://www.cdc.gov/nchs/about/major/nhanes/nh3data.htm. Accessed May 9, 2008.

16. Centers for Disease Control and Prevention. National Health and Nutrition Examination III Linked Mortality File: Matching Methodology. Available at: http://www.cdc.gov/nchs/data/datalinkage/matching_methodology_nhanes3_final.pdf. Accessed April 8, 2008.

17. Wheatcroft G, Cox CS, Lochner KA. Comparative analysis of the NHANES III public-use and restricted-use linked mortality files. Available at: http://www.cdc.gov/nchs/data/datalinkage/nh3_mort_compare_2007_final.pdf. Accessed April 14, 2008.

18. Centers for Disease Control and Prevention. National Health and Nutrition Examination III adult data file documentation. Available at: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/NHANES/NHANESIII/1A/ADULT-acc.pdf. Accessed April 14, 2008.

19. Centers for Disease Control and Prevention. Physical activity for everyone Web site. Available at: http://www.cdc.gov/nccdphp/dnpa/physical/everyone/recommendations/index.htm. Accessed April 16, 2008.

20. Haskell WL, Lee IM, Pate RR, et al. Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Circulation.* 2007;116:1081–1093.

21. Centers for Disease Control and Prevention. National Health and Nutrition Examination III, Cycle 2 Physician Examiner's Training Manual. Available at: http://www.cdc.gov/nchs/data/nhanes/nhanes3/cdrom/nchs/manuals/phys.pdf. Accessed April 8, 2008.

22. Korn EL, Graubard BI. *Analysis of Health Surveys.* Wiley Series in Probability and Statistics. New York, NY: Wiley; 1999.

23. Dorn S. Uninsured and Dying Because of It: Updating the Institute of Medicine Analysis on the Impact of Uninsurance on Mortality. Available at: http://www.urban.org/UploadedPDF/411588_uninsured_dying.pdf. Accessed April 23, 2008.

24. US Census Bureau. Health insurance coverage status and type of coverage all persons by age and sex: 1999 to 2007. Available at: http://www.census.gov/hhes/www/hlthins/historic/hihistt2.xls. Accessed August 25, 2009.

25. Centers for Disease Control and Prevention, National Center for Health Statistics. Death rates by 10-year age groups: United States and each state, 2000. Available at: http://www.cdc.gov/nchs/data/statab/VS00100_TABLE23A.pdf. Accessed August 25, 2009.

26. Centers for Disease Control and Prevention, National Center for Health Statistics. Death rates by 10-year age groups: United States and each state, 2005. Available at: http://www.cdc.gov/nchs/data/statab/MortFinal2005_Worktable23R.pdf. Accessed August 25, 2009.

27. Centers for Medicare and Medicaid Services. Key milestones in CMS programs. Available at: http://www.cms.hhs.gov/History/Downloads/CMSProgramKeyMilestones.pdf. Accessed May 20, 2008.

28. Lurie N, Ward NB, Shapiro MF, Brook RH. Termination from Medi-Cal–does it affect health? *N Engl J Med.* 1984;311:480–484.

29. Lurie N, Ward NB, Shapiro MF, Gallego C, Vaghaiwalla R, Brook RH. Termination of Medi-Cal benefits. A follow-up study one year later. *N Engl J Med.* 1986;314:1266–1268.

43

30. Oster A, Bindman AB. Emergency department visits for ambulatory care sensitive conditions: insights into preventable hospitalizations. *Med Care.* 2003;41: 198–207.

31. Weissman JS, Gatsonis C, Epstein AM. Rates of avoidable hospitalization by insurance status in Massachusetts and Maryland. *JAMA.* 1992;268: 2388–2394.

32. Wilper AP, Woolhandler S, Lasser KL, McCormick D, Bor DH, Himmelstein DU. Chronically ill and uninsured: a national study of disease prevalence and access to care among U.S. adults. *Ann Intern Med.* 2008;149: 170–176.

33. Baker DW, Sudano JJ, Albert JM, Borawski EA, Dor A. Lack of health insurance and decline in overall health in late middle age. *N Engl J Med.* 2001;345: 1106–1112.

34. Baker DW, Sudano JJ, Albert JM, Borawski EA, Dor A. Loss of health insurance and the risk for a decline in self-reported health and physical functioning. *Med Care.* 2002;40:1126–1131.

35. McWilliams JM, Meara E, Zaslavsky AM, Ayanian JZ. Health of previously uninsured adults after acquiring Medicare coverage. *JAMA.* 2007;298: 2886–2894.

36. McWilliams JM, Meara E, Zaslavsky AM, Ayanian JZ. Use of health services by previously uninsured Medicare beneficiaries. *N Engl J Med.* 2007;357: 143–153.

37. Newhouse J. *Free for All? Lessons From the RAND Health Insurance Experiment.* Cambridge, MA: Harvard University Press; 1993.

38. Tamblyn R, Laprise R, Hanley JA, et al. Adverse events associated with prescription drug cost-sharing among poor and elderly persons. *JAMA.* 2001;285: 421–429.

39. Graves JA, Long SK. Why do people lack health insurance? Health Policy Online: Timely Analysis of Current Trends and Policy Options. Available at: http://www.urban.org/UploadedPDF/411317_lack_health_ins.pdf. Accessed May 29, 2008.

40. Hadley J, Waidmann T. Health insurance and health at age 65: implications for medical care spending on new Medicare beneficiaries. *Health Serv Res.* 2006;41: 429–451.

41. Kung H, Hyoert D, Xu J, et al. Deaths: final data for 2005. *Natl Vital Stat Rep.* 2008;56(10). Available at: http://www.cdc.gov/nchs/data/nvsr56/nvsr56_10.pdf. Accessed February 17, 2009.

EMBARGOED UNTIL:
August 4, 2008
5:01 p.m. EST

CONTACTS:
Andrew P. Wilper, M.D.   503-260-4948
Mark Almberg   312-782-6006

Millions of chronically ill, lacking insurance, can't get needed care

Over 11 million Americans with chronic physical illnesses like heart disease, diabetes and asthma are not getting the medical care they need because they don't have health insurance, a new study shows. The study provides the first national estimate of the number of uninsured adults with these potentially serious but treatable conditions.

According to an article published in the Aug. 5 edition of Annals of Internal Medicine, a leading medical journal, working-age adults with one or more chronic illnesses who reported they were uninsured were nearly four times more likely than their insured counterparts to have not seen a health professional within the past year (22.6 percent versus 6.2 percent). They were also six times more likely to identify a hospital emergency room as their standard site for care when sick (7.1 percent versus 1.1 percent).

"We have made dramatic advances in treatment of chronic illnesses like heart disease and high blood pressure," said Dr. Andrew Wilper, the study's lead author. "But many Americans are locked out of the system because they are uninsured and cannot afford this life-saving care.

"Many of these individuals end up with preventable emergency room visits, hospitalizations, amputations, kidney failure or worse because their chronic condition has gotten out of control," he said.

Wilper's team analyzed data from surveys conducted by the National Center for Health Statistics. The team found that there are 11.4 million nonelderly adults with one or more chronic conditions who lack health insurance, including 1.3 million who survived a heart attack or stroke, 5.9 million with high blood pressure, 1.4 million with diabetes and 3.5 million with asthma or emphysema. Individuals with at least one of these conditions, or with high cholesterol or prior cancer (excluding minor skin cancers), were considered to have a chronic illness.

The 11.4 million figure represents about one-third of the total number of uninsured people in the United States between the ages of 18 and 64. Altogether, about 47 million Americans lacked health insurance in 2006, according to the U.S. Census Bureau.

The authors say they may have underestimated the number of chronically ill persons who lack insurance because the survey did not query participants about depression or other chronic mental illnesses, and because undiagnosed physical diseases among the uninsured may be common.

Uninsured people with chronic illnesses face serious obstacles to getting needed care, Wilper said. But he also observed that people who are enrolled in high-deductible health plans often face similar barriers to getting regular medical attention.

"Some plans, for example, require people to pay medical bills of $5,000 out-of-pocket before their insurance kicks in," he said. "These plans put people in the precarious state of being underinsured, which is not that much better than lacking health insurance altogether."

Wilper, who currently teaches at the University of Washington School of Medicine in Seattle, was a fellow at Harvard University and the Cambridge Health Alliance when the study was carried out.

Dr. Steffie Woolhandler, a co-author of the study, is an associate professor of medicine at Harvard and a primary care physician in Cambridge, Mass. Woolhandler noted: "Some claim that uninsured Americans can get the care they need in emergency rooms. But emergency rooms may provide too little, too late for the millions of uninsured with chronic conditions. They need regular medical monitoring, and a steady supply of medications to control their illnesses, and a whole array of services that are out of reach for the uninsured.

"Only national health insurance can fix this broken system and save thousands of lives each year," she said.

####

Copies of the study are available at http://www.annals.org/cgi/content/abstract/149/3/170

"Chronically Ill and Uninsured: A National Study of Disease Prevalence and Access to Care in U.S. Adults," Andrew P. Wilper, MD; Steffie Woolhandler, MD, MPH; Karen E. Lasser, MD, MPH; Danny McCormick, MD; David H. Bor, MD; and David U. Himmelstein, MD. Annals of Internal Medicine, August 2008. Annals of Internal Medicine is published by the American College of Physicians.

Physicians for a National Health Program, a membership organization of over 15,000 physicians, supports a single-payer national health insurance program. To contact a physician-spokesperson in your area, visit www.pnhp.org/stateactions or call (312) 782-6006.