



THE KAISER COMMISSION ON
Medicaid and the Uninsured

**SICKER AND POORER:
THE CONSEQUENCES OF BEING
UNINSURED**

EXECUTIVE SUMMARY

UPDATED FEBRUARY 2003



THE KAISER COMMISSION ON
Medicaid and the Uninsured

THE COST OF NOT COVERING THE UNINSURED PROJECT

The Kaiser Commission on Medicaid and the Uninsured initiated the Cost of Not Covering the Uninsured project to explore what is known and what should be known about the costs society incurs by leaving more than 41 million individuals uninsured. Under this initiative, we have convened an expert advisory group that works with staff of the Commission and other researchers to develop new information and analyses to further our understanding of and raise awareness about this critical issue.

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SICKER AND POORER: THE CONSEQUENCES OF BEING UNINSURED

Executive Summary

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for

"The Cost of Not Covering the Uninsured Project"

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EXECUTIVE SUMMARY

Much of the ongoing debate over providing health insurance coverage for the over 41 million Americans who have no health insurance today revolves primarily around the questions of how much it will cost and who ought to pay. The debate periodically stalls, perhaps in large part, because the full benefits – particularly the economic benefits – to both the individual and the nation as a whole have not yet been fully weighed and discussed.

Research showing that having health insurance positively affects the use of health services is clear and widely accepted. Perceptions about the relationship between health insurance and health outcomes are more ambiguous, however, in part because of confusion between studies that assess the effects of additional medical care use by the well insured and studies that compare uninsured to privately insured people. This summary focuses primarily on the relationship between health insurance and health outcomes, which has been addressed by a surprisingly large number of studies over the past 25 years, as well as the link between health and educational attainment

FINDINGS IN BRIEF

An exhaustive review of the major findings from the past 25 years of health services research on the effects of health insurance coverage demonstrates that:

- ***The uninsured receive less preventive care, are diagnosed at more advanced disease stages, and once diagnosed, tend to receive less therapeutic care (drugs and surgical interventions);***
- ***Having health insurance would reduce mortality rates for the uninsured by 10–15 percent; and***
- ***Better health would improve annual earnings by about 10–30 percent (depending on measures and specific health condition) and would increase educational attainment.***

and economic opportunity.¹

The research reviewed for this report was identified using both multiple online key-word searches of studies published between 1991 and 2001 using two large library databases (Medline and EconLit) and also a search of other relevant literature reviews and bibliographies that spanned twenty years. Screening over 9,000 citations (many of which were duplicate appearances of the same studies across multiple searches) produced a list of 230 distinct research papers, both published and unpublished, relevant to this evaluation. Over 90 of these studies analyzed the association between health insurance coverage or medical care use and health outcomes. These studies were organized into three broad categories: specific disease outcomes, general health outcomes, and maternal-child health outcomes. Evidence establishing the relationship between health insurance and medical care efficiency, education, and work productivity is reviewed.

Nearly all of the research to date consists of observational studies, except for a few natural experiments resulting from the implementation, expansion, or loss of a health insurance program in a specific location. Observational studies alone cannot answer the question of whether health insurance directly affects health outcomes because they cannot identify the causal direction of the relationship between insurance and health and may not be able to control for other, often unobserved, factors that might be affecting insurance coverage and health at the same time. True experimental designs, where health insurance is randomly provided to some but not to others, have not been conducted. In the absence of a randomly deigned experiment, however, conclusions can be drawn from the cumulative weight of a large body of observational studies and natural

¹ This summary is based on *Sicker and Poorer: The Consequences of Being Uninsured*, by Jack Hadley, The Kaiser Commission on Medicaid and the Uninsured, May 2002, available at <http://www.kff.org/content/2002/20020510/4004.pdf>.

experiments when methodologies are carefully reviewed and a consistent pattern among the strongest studies emerges.

This report summarizes the evidence found through a rigorous review of the literature on the association between health insurance and health outcomes. Studies that have failed to find a positive relationship between health insurance, medical care, and health outcomes are included throughout the report as well for comparison to the majority of studies that have found that health insurance make a difference.

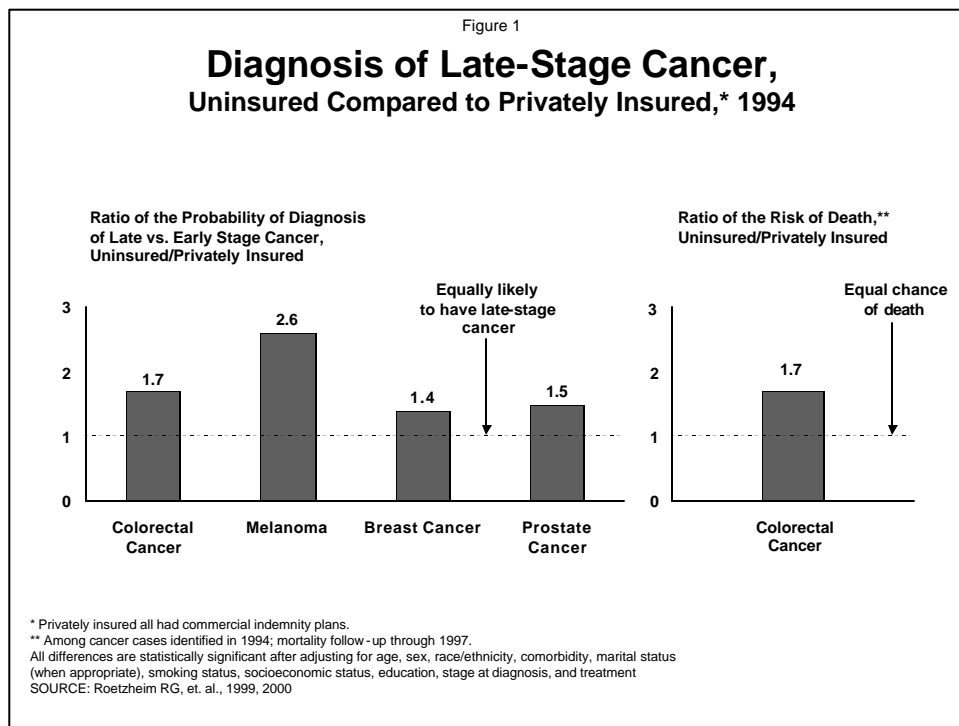
This report concludes that a compelling case has been made that having health insurance does lead to improved health by means of better access to medical care. Furthermore, the available research on the links between health insurance, health status, and an individual's productivity begins to provide a reasonable basis for future economic analyses of the benefits of health insurance to the nation as a whole. The main findings are summarized here.

Do the Uninsured Have Worse Health Outcomes for Specific Conditions?

Research examining persons with particular diseases or health problems helps to control for health differences that may be biasing studies of health insurance's impact. If the uninsured use fewer preventive and diagnostic services, are more severely ill when diagnosed, receive fewer therapeutic services, *and* have poorer outcomes than the insured – *even though they both suffer from the same disease* – then we can be more confident that real differences in overall mortality rates and general health are due to a lack of health coverage.

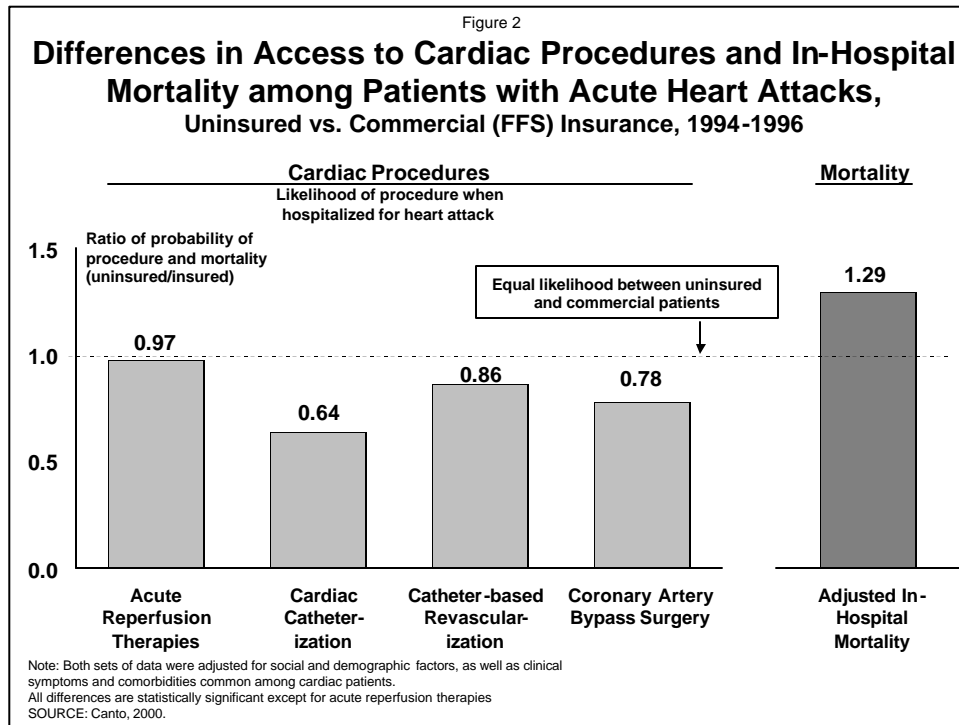
Many studies throughout the 1980s and 1990s have examined the relationship between health coverage and cancer screening and detection. All but two studies have found that people who have insurance are significantly more likely to have had recent mammograms, Pap smears, prostate exams, and colon

cancer screening. Furthermore, whether a health plan covers a specific kind of breast screening test appears to determine whether or not those with insurance receive the test. The chances of surviving cancer are greatly reduced when the disease is diagnosed late in its progression. Higher cancer mortality rates (ranging from 1.2 to 2.1 times greater across types of cancers with varying follow-up periods) reflect the fact that the uninsured are more likely to be diagnosed with late-stage melanoma, colorectal, breast, prostate, and cervical cancers compared to those who are insured (Figure 1).



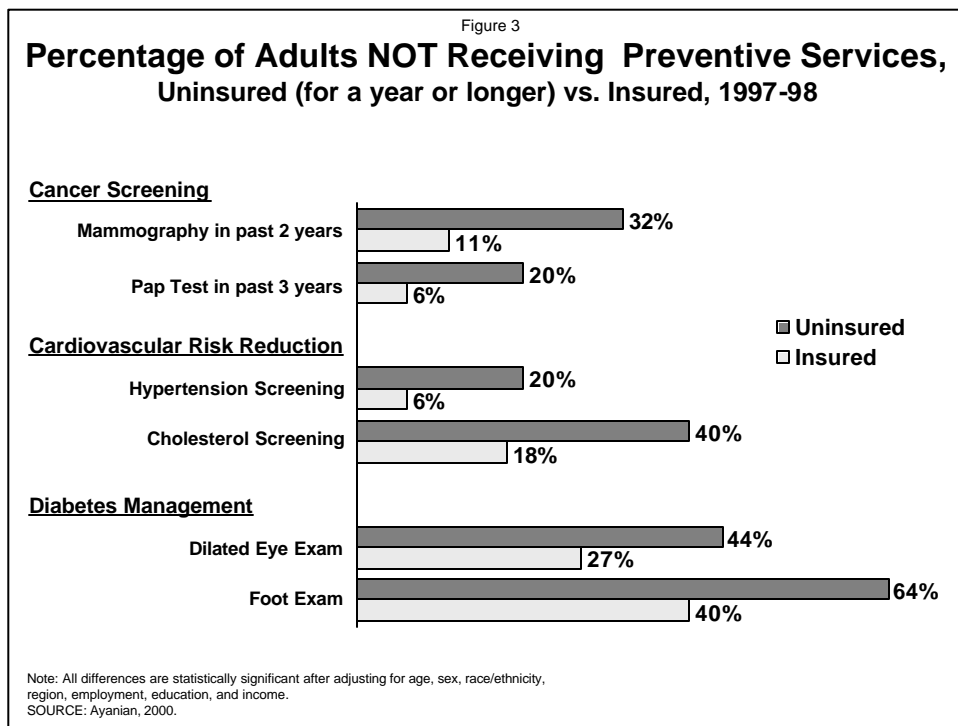
Findings from the review of cardiovascular disease studies are similar. Both preventive and therapeutic interventions differ by type of health coverage. Preventive screening for two of the major risk factors for heart disease – elevated cholesterol and hypertension – is less common among the uninsured. Among those with high blood pressure, the uninsured are less likely to be taking anti-hypertensive medications. Several studies conducted in the 1980s and 1990s have found that among persons admitted to the hospital for a heart attack or heart disease, the uninsured are less likely to receive major interventions, such as cardiac catheterizations, angioplasty, and coronary bypass surgery. In one of

the largest studies of myocardial infarction patients based on a national registry of over 330,000 patients collected between 1994 and 1996, researchers found that in addition to the fact that uninsured patients had significantly lower rates of cardiac catheterization and revascularization procedures, they also experienced a roughly 25% higher in-hospital mortality rate compared to the privately insured (Figure 2).

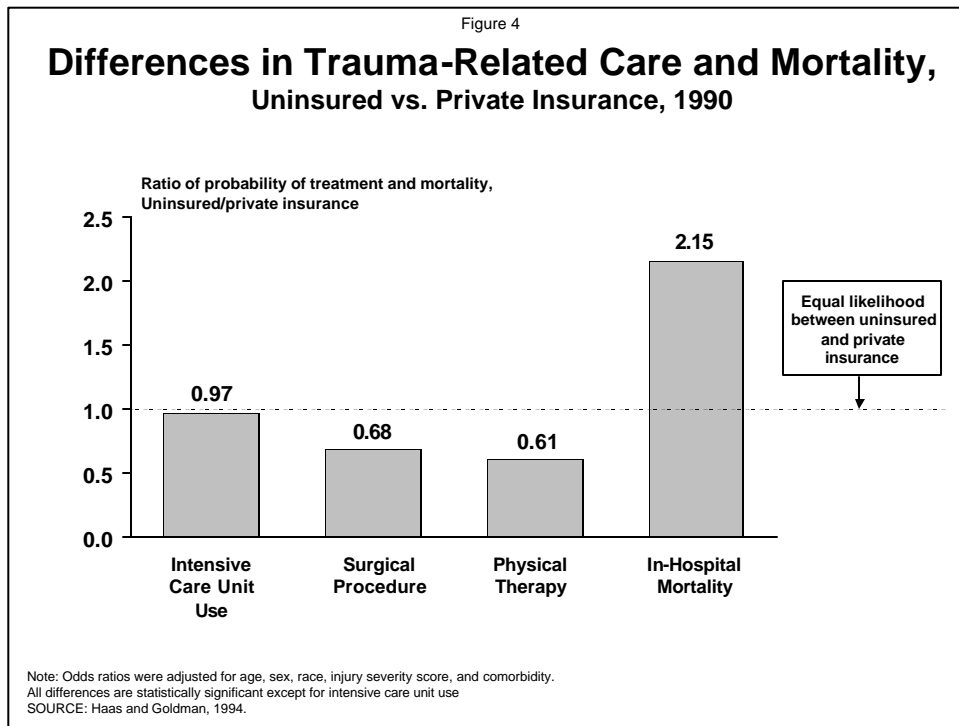


Part of these differences may be explained by the fact that the uninsured may be less likely to be admitted to a hospital that provides cardiac diagnostic and surgical services. Two studies have found that insurance disparities in treatment did not occur in hospitals with invasive cardiac services but did occur among patients initially admitted to hospitals without the specialty services. It has also been found that the uninsured are more likely to delay seeking care for chest pain, which can cause more heart damage and make the patient a less desirable candidate for procedures. Finally, the concern that insured patients may be over-utilizing heart procedures (which could explain the disparities) as opposed to the uninsured under-utilizing care has not been supported by research to date.

Differences in disease management have also been found for persons with diabetes, kidney disease, liver disease, pneumonia, and cystic fibrosis. Uninsured diabetics, for example, are less likely than those with insurance to receive preventive services (e.g., eye exams, foot exams, careful monitoring of blood glucose levels) and also less likely to have good blood glucose control (Figure 3). In-hospital mortality rates for pneumonia and liver disease patients and overall mortality for cystic fibrosis patients were also consistently higher for the uninsured compared to the insured.



Finally, research examining outcomes for trauma patients demonstrates that even in a condition relatively unrelated to the person's previous access to health care, medical care does differ for the uninsured. Except for the most severe trauma cases, the uninsured are less likely to be admitted to the hospital after being seen in the emergency room. Among those with severe injury, the uninsured are equally likely to be admitted to an ICU but less likely to undergo an operative procedure and are more than twice as likely to die in the hospital (Figure 4).



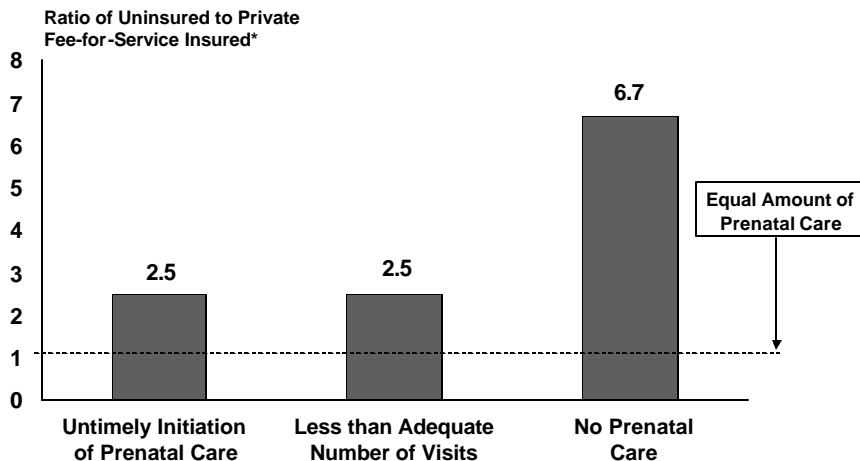
Do the Uninsured Have Poorer Birth Outcomes than the Insured?

Insurance coverage of pregnant women, infants and children has increased in recent years, due primarily to expanded Medicaid eligibility starting in the late 1980s and the establishment of the State Children's Health Insurance Program (SCHIP) in the late 1990s. Research has demonstrated that having health insurance increases timely initiation of prenatal care, promotes access to C-section deliveries for high-risk births and increases access to neonatal intensive care for high-risk babies (Figure 5).

Although the evidence is mixed that more prenatal care improves birthweight, there is solid evidence that uninsured babies have poorer survival than the privately insured. A study published in 1989 found that, compared to privately insured newborns, the uninsured had a higher relative risk of adverse birth outcomes. Even more strikingly, a 1998 study found that uninsured babies had relative odds of dying that were about 1.5 times higher than those who were privately insured (Figure 6). Research has shown that expanding health

Figure 5

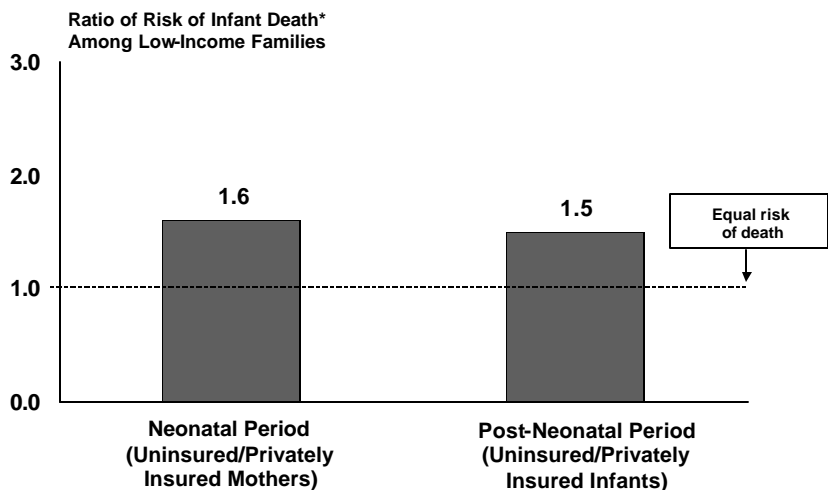
Access to Prenatal Care, by Insurance Status, 1990



* Odds ratios are statically significant after adjusting for mother's insurance status, race/ethnicity, birthplace, age, parity, education, and marital status
SOURCE: Braveman et. al., 1993

Figure 6

Mothers' Prenatal Insurance Coverage and Infant Mortality Risk, 1998



* Odds ratios adjusted for mother's age, education, race/ethnicity, income, health and pregnancy history, and WIC participation
Neonatal period is the first 28 days of life
Low-income is defined as less than 185% of the poverty level
SOURCE: Moss and Carver, 1998

insurance coverage in Canada through national health insurance reduced infant mortality nationally by about 4%. Two studies have found that Medicaid eligibility expansions have resulted in reductions in infant mortality by 5-9%.

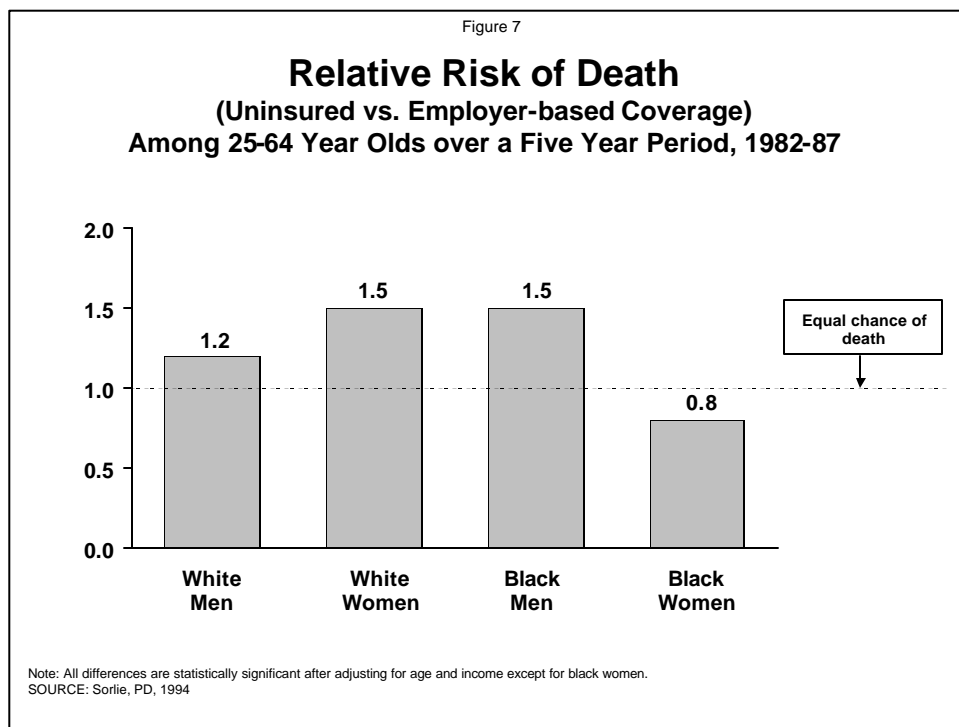
However, some studies have found no differences in health outcomes between the uninsured and Medicaid beneficiaries. These are particularly hard to interpret in evaluations of Medicaid program expansions. If health insurance is an important factor influencing health outcomes, why wouldn't Medicaid beneficiaries fair better than the uninsured? Taking a closer look at the characteristics of people covered by Medicaid and the way the Medicaid program is structured suggests a number of explanations for the paradoxical findings.

First of all, people who enroll in Medicaid are different from the general population, including the uninsured. They tend to have the lowest incomes, come from single-parent families, and are less likely to be in the workforce. They often first become eligible for the program because of their pregnancy, poor health, or a new disability. For example, an uninsured pregnant woman may not become enrolled in Medicaid until late in her pregnancy and may have delayed receiving prenatal care until then. The birth outcome would more likely reflect her earlier uninsured status and not the difference Medicaid may have made had she received early and continuous coverage throughout her pregnancy. Besides these socioeconomic and health differences, the structure of the Medicaid program (lower provider payments, eligibility and enrollment barriers, as well as the variation in programs across 50 states) can create differences in the services Medicaid patients receive. For example, Medicaid coverage is often short-term or transitory because of its income eligibility requirements, so that the positive health effects of continuous access to medical care may never be realized.

Do the Uninsured Have Poorer General Health Outcomes than the Insured?

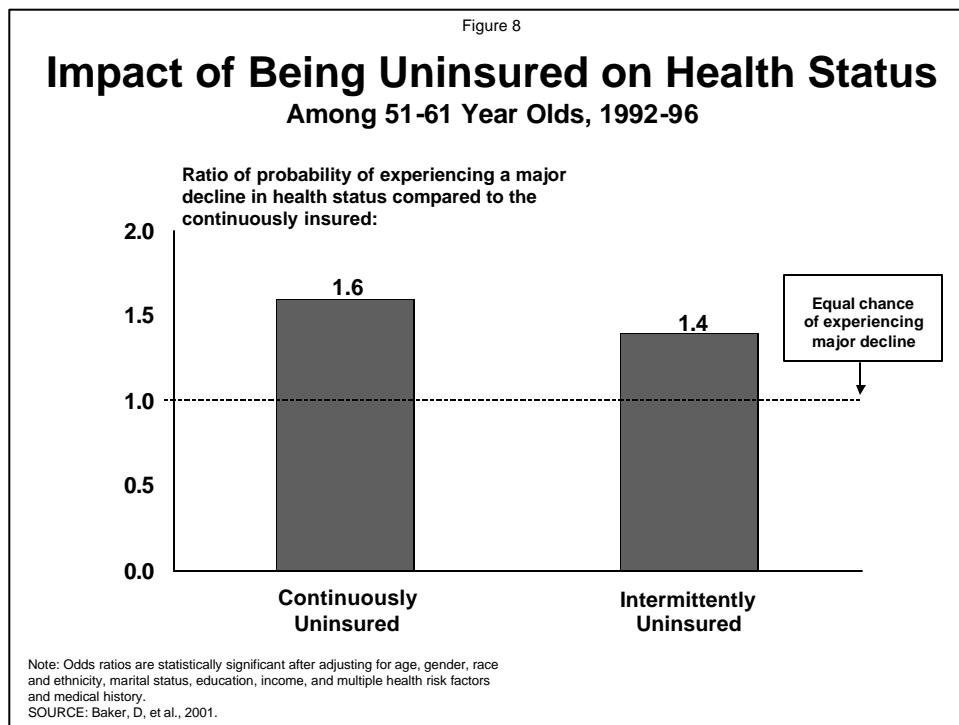
Many people believe that the uninsured receive the care they need or, if they do not receive care, that they suffer no serious health consequences. Surveys conducted in 1999 and 2000 found that 57% of Americans believed that "the uninsured are able to get the care they need from doctors and hospitals." Moreover, 12% believed that those unable to get care do not suffer serious health consequences. Contrary to these perceptions, studies and surveys have consistently found that the uninsured are less likely to obtain services (e.g., see a doctor or fill a prescription) when they have a perceived "need for care" and that they suffer worse health outcomes.

A number of longitudinal studies have found that those who are uninsured at baseline have higher mortality over time. One analysis determined that uninsured adults were from 1.2 to 1.5 times more likely to have died after five years than those who were insured (Figure 7).



Other work has found that the uninsured have a relative risk of death 1.25 times higher than the insured. A longitudinal study examining a 17-year period demonstrated that nearly twice as high a proportion of the uninsured had died over the study period, 18.4% of the uninsured compared to 9.6% of the privately insured.

Research has determined that middle-aged people who were continuously uninsured over a four-year period were 1.6 times more likely than the continuously insured to have a “major health decline” (including death). Those with intermittent insurance coverage were 1.4 times more likely to experience a similar decline than the continuously insured (Figure 8).



Studies have also found that qualifying for Medicare by turning 65 significantly increases medical care use by the elderly and contributes to lower mortality than would be expected based on projections prior to age 65. Another body of research has demonstrated that uninsured hospital patients are more likely to be admitted in worse condition than those who are privately insured and are more

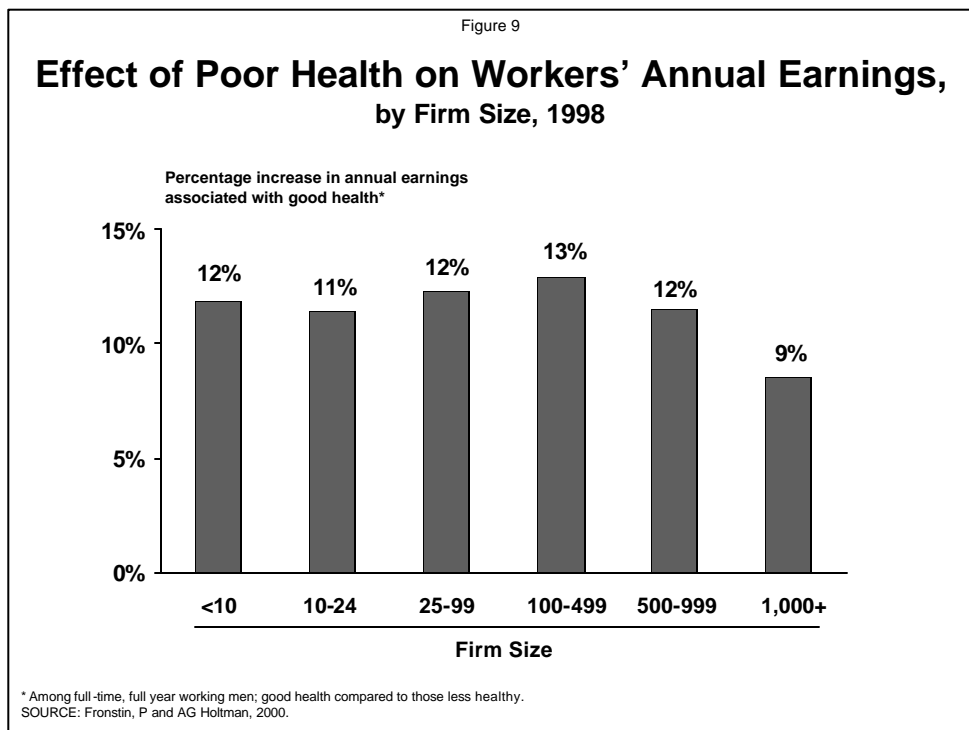
likely to die in the hospital even after controlling for differences in severity on admission.

Researchers have found that having health insurance increases medical care use by about 50%. Another area of research has determined that a 10% increase in medical care spending is associated with a 1-3% decrease in mortality rates. Combining these two lines of research leads to a conclusion that a 50% increase in medical care use could be expected to reduce mortality rates by 5-15%. This range is very consistent with, albeit somewhat lower than the range of estimates found by studies of the relationship between health insurance and mortality. Given the broad range of data, populations, time periods, statistical methods, and measures in these studies, this consistency provides reassurance that the results are not spurious or due to underlying bias.

Although there are some studies that fail to find an effect of health insurance on health outcomes, for the most part these examine trends from earlier time periods (pre-1970); look at resource use within well-insured populations (Medicare), not the uninsured compared to insured; or they focus on intermediate rather than final health outcome (birthweight rather than infant survival).

Does Poor Health Reduce Annual Income and Educational Attainment?

Many studies have looked at the components of work effort – labor force participation, full or part-time status, wage rates and annual income. Although results vary, in part due to differences in how health is measured (e.g., general health status, activity limitations, the effect of a specific disease) the research generally concludes that poor health reduces annual earnings from work, primarily through reduced labor force participation and work effort in conjunction with a small effect on productivity as measured by wage rates (Figure 9).

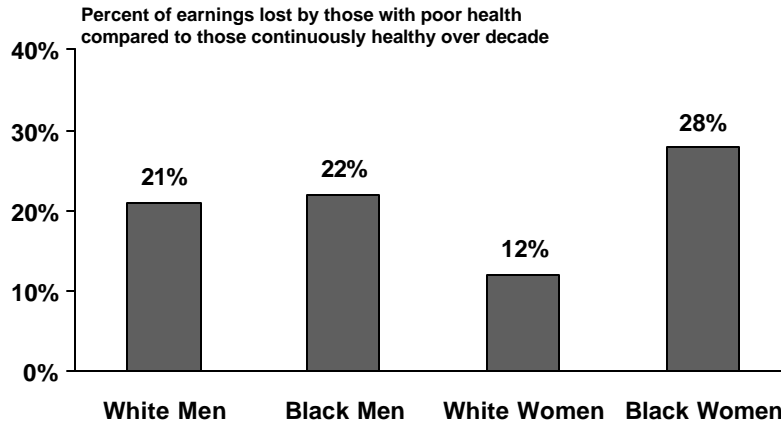


Establishing the link between health and work status is confounded by the fact that people in poor health are less likely to work, so that studying only those currently in the workforce probably understates the total effect of poor health on earnings. In addition, in those studies that include the non-working, those who choose not to work or to work less may be inclined to report poorer health as a socially acceptable reason for not working. However a few studies have adjusted for this potential bias and still found that poor health reduced a worker's annual earnings by roughly 15 to 30 percent (Figure 10).

Fewer recent studies exist that examine the relationship between a child's health and their ability to succeed in school, however the available research supports the intuitive – poor health does affect educational attainment. Several studies have also found a relationship between slowed growth from low birthweight and cognitive development, which also affects educational attainment. Studies also suggest that prematurity and low birthweight lead to higher medical and education costs during childhood.

Figure 10

**Effect of Poor Health History on Annual Earnings,
among 45-64 Year Olds over a Ten Year Period (1966/67 – 1976/77)**



SOURCE: Chirikos, TN and G Nestel, 1985

Conclusions and Implications

While some contrary studies do exist, the large majority of health services research demonstrates a fairly remarkable consistency in the relationships among health insurance coverage, timely use of medical care, health, education, work, and earnings. Studies of different medical conditions, conducted at different times, using different data sets and statistical methods have produced quantitative estimates of the effects of having health insurance or using more medical care that are consistent with each other and fall within a relatively narrow range.² Health insurance does indeed matter -- and it has a positive effect on health outcomes, including mortality rates. The relationship between good health and higher income and workforce participation has also been established.

The next step for health services research is to estimate the size of the economic benefits of continuous health coverage. How much could be saved by increasing

² See Table 1, which summarizes selected studies from each of the different areas of research.

the efficiency of medical care, so that fewer are delaying care until it becomes more costly to treat? How much would labor force participation increase if coverage were expanded to more Americans? How much would incomes and tax revenues increase? What might be the effects on federal and state disability payments? What are the implications for both Medicare and Medicaid spending of having a healthier population?

Estimates of the size of the potential economic benefits should become a prominent part of policy debates over expanding health insurance coverage. These estimates may help shift the current focus from the direct costs of health insurance expansions to the question of how much is likely to be saved by expanding coverage, and ultimately to policy decisions based on a truer sense of the net cost to the nation to cover all Americans.

This summary was prepared by Jack Hadley of the Urban Institute and by Catherine Hoffman and David Rousseau of the Kaiser Commission on Medicaid and the Uninsured. It is based on Jack Hadley's "Sicker and Poorer: The Consequences of Being Uninsured" (May 2002), available at <http://www.kff.org/content/2002/20020510/4004.pdf>

Table 1
SUMMARY OF RESULTS OF SELECTED STUDIES

STUDY	OUTCOME	RESULTS*
SPECIFIC DISEASES		
Ayanian JZ, Kohler BA, Abe T, Epstein AM. "The Relationship Between Health Insurance Coverage and Clinical Outcomes Among Women with Breast Cancer." <i>The New England Journal of Medicine</i> , July 1993, 329: 326-31.	Breast cancer stage at diagnosis and survival	Compared to privately insured, uninsured were 1.68 times more likely to be diagnosed with distant disease and 1.49 times more likely to have died 54-89 months after diagnosis.
Lee-Feldstein A, Feldstein PJ, Buchmueller T, Katterhagen G. "The Relationship of HMOs, Health Insurance, and Delivery Systems to Breast Cancer Outcomes." <i>Medical Care</i> , 2000, 388(7): 705-18.	Breast cancer stage at diagnosis and survival	Compared to privately insured, uninsured and publicly insured were 2.01 times more likely to be diagnosed with stage III/IV disease and 1.42 times more likely to have died from breast cancer after 53 months average follow-up time.
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." <i>American Journal of Public Health</i> , November 2000, 90(11): 1746-54.	Colorectal cancer treatment and survival	Compared to private fee-for-service patients, uninsured were less likely to receive definitive surgery (RO=0.57) and more likely to die within 36-48 months (RR=1.16-1.22)
Young GJ, Cohen BB. "Inequities in Hospital Care, the Massachusetts Experience." <i>Inquiry</i> , Fall 1991, 28: 255-62.	Emergency patients with acute myocardial infarction (AMI), treatment and outcome	Compared to fee-for-service patients, uninsured were less likely to receive coronary bypass graft surgery (RO=0.57) or angioplasty (RO=0.64), and more likely to die within 90 days of discharge (RO=1.57)
Canto JG, Rogers WJ, French WJ, Gore JM, Chandra NC, Barron HV. "Payer Status and the Utilization of Hospital Resources in Acute Myocardial Infarction." <i>Archives of Internal Medicine</i> , March 2000, 160: 817-23.	AMI patients (from the National Registry of Myocardial Infarction), treatment and outcome	Compared to commercially insured patients, the uninsured were less likely to receive coronary arteriography (RO=0.64), catheter based revascularization (RO=0.86), or coronary bypass surgery (RO=0.78), but more likely to die in the hospital (RO=1.29).
Hadley J. <i>More Medical Care, Better Health? An Economic Analysis of Mortality Rates</i> . Washington D.C.: The Urban Institute Press, 1982.	Age-sex-race specific cardiovascular disease mortality rates across geographic areas in 1970	A 10% higher level of medical care use per capita was associated with lower mortality rates (ranging from 1.5% to 4.2%, depending on the group).

* RO=relative odds, RR=relative risk; all reported results are statistically significant.

STUDY	OUTCOME	RESULTS*
Hadley J. "Medicare Spending and Mortality Rates of the Elderly." <i>Inquiry</i> . Winter 1988, 25: 485-93.	Sex-race specific cardiovascular mortality rate across geographic areas for three Medicare age groups in 1980	A 10% higher level of Medicare spending per beneficiary was associated with lower mortality rates (ranging from 3.0 to 4.4% for Whites and 7.1 to 13.3% for Blacks, depending on the group).
Haas JS, Goldman L. "Acutely Injured Patients with Trauma in Massachusetts: Differences in Care and Mortality, by Insurance Status." <i>American Journal of Public Health</i> , October 1994, 84(10): 1605-068.	Acute trauma treatment and mortality	Compared to privately insured, uninsured were less likely to receive an operative procedure (RO=0.68) and more likely to die in the hospital (RO=2.15)
ADULT MORTALITY		
Sorlie PD, Johnson NH, Backlund E, Bradham. Douglas D. "Mortality in the Uninsured Compared with that in Persons with Public and Private Health Insurance." <i>Archives of Internal Medicine</i> , November 1994, 154: 2409-16.	General mortality over 5-year period for a longitudinal sample of 25-64 year olds at baseline	Compared to those with employer-sponsored insurance, uninsured had higher relative risk of dying (RR=1.2 for white men, RR=1.5 for white women, RR=1.5 for black men)
Franks P, Clancy CM. "Health Insurance and Subjective Health Status: Data from the 1987 National Medical Expenditure Survey." <i>American Journal of Public Health</i> , September 1993, 83(9): 1295-9.	General mortality over 12-16 years in longitudinal sample of adults	Compared to insured, uninsured had higher relative risk of dying (RR=1.25). Over the entire period, 18.4% of uninsured had died compared to 9.6% of insured.
Baker DW, Sudano JJ, Albert JM, Borawski EA, Dor A. "Lack of Health Insurance and Decline in Overall Health in Late Middle Age." <i>The New England Journal of Medicine</i> , October 2001, 345(15): 1106-12.	Major health decline (including death) over 4 years in a longitudinal sample of 51-61 year olds at baseline	Compared to privately insured, uninsured had a higher relative risk of a major health decline (RR=1.41).
Hadley J, Steinberg EP, Feder J. "Comparison of Uninsured and Privately Insured Hospital Patients: Condition on Admission, Resource Use, and Outcome." <i>JAMA</i> , January 1991, 265(3): 374-9.	General in-hospital mortality	Compared to privately insured, uninsured had a significantly higher odds of in-hospital mortality in 12 of 16 age-sex-race specific nonelderly population cohorts. (15 of the relative odds were greater than 1.00, and significant values ranged from 1.15 to 3.20.)
Hadley J. <i>More Medical Care, Better Health? An Economic Analysis of Mortality Rates</i> . Washington D.C.: The Urban Institute Press, 1982.	Age-sex-race specific all-cause mortality rates across geographic areas in 1970	A 10% higher level of medical care use per capita was associated with lower mortality rates (ranging from 0.7% to 3.2%, depending on the group).
Hadley J. "Medicare Spending and Mortality Rates of the Elderly." <i>Inquiry</i> , Winter 1988, 25: 485-93.	Sex-race specific all-cause mortality rates across geographic areas for three Medicare age groups in 1980	A 10% higher level of Medicare spending per beneficiary was associated with lower mortality rates (ranging from 2.5 to 4.4% for Whites and 5.6 to 10.0% for Blacks, depending on the group).

STUDY	OUTCOME	RESULTS*
Lichtenberg FR. "The Effects of Medicare on Health Care Utilization and Outcomes." in Garber AM, editor, "Frontiers in Health Policy Research," vol. 5. <i>NBER</i> , 2001: 1-38. Unpublished.	Natural experiment of becoming eligible for Medicare at age 65 on mortality and morbidity	Relative to projections based on trends prior to age 65, both morbidity (days in bed) and mortality decline 13%; a 10% increase in physician visits (as a proxy for greater medical care use) is estimated to reduce the age-specific mortality rate by 5%.
INFANTS' AND CHILDREN'S HEALTH		
Braveman P, Oliva G, Miller MG, Reiter R, Egerter S. "Adverse Outcomes and Lack of Health Insurance Among Newborns in an Eight-County Area of California, 1982 to 1986." <i>The New England Journal of Medicine</i> , August 1989, 321(8): 508-13.	Adverse birth outcomes (long stay, transfer, or death) in California, 1982-1986	Compared to privately insured newborns, uninsured had higher relative risk of adverse outcome (RR=1.11 in 1982, 1.19 in 1984, and 1.31 in 1986).
Currie J, Gruber J. "Health Insurance Eligibility, Utilization of Medical Care, and Child Health." <i>The Quarterly Journal of Economics</i> , May 1996, 431-55.	Infant mortality rates across states between 1979 and 1992	Thirty percentage-point expansion of Medicaid eligibility to more low-income pregnant women decreased infant mortality rate by 8.5%.
Currie J, Gruber J. "Saving Babies: The Efficiency and Cost of Recent Changes in the Medicaid Eligibility of Pregnant Women." <i>Journal of Political Economy</i> , 1996, 104(6): 1263-96.	Childhood (ages 1-14) mortality rates across states between 1984 and 1992.	Doubling Medicaid eligibility percentage reduced childhood mortality by 5-9%.
Liu GG. "Birth Outcomes and the Effectiveness of Prenatal Care." <i>Health Services Research</i> , February 1998, 32(6): 805-23.	Birthweight of 30,673 infants born to mothers age 20 or above in Virginia in 1984	Adjusting for the decisions to carry a pregnancy to term and to select into prenatal care increased the impact of prenatal delay on birthweight fivefold, to roughly 75 grams lower weight per month of delay.
Hanratty MJ. "Canadian National Health Insurance and Infant Health." <i>American Economic Review</i> , 1996, 86(1): 276-84.	Infant mortality and the incidence of low birthweight in Canadian provinces, 1960-1974	Using variation in the implementation date of Canadian National Health Insurance as a natural experiment, expanded insurance coverage reduced infant mortality by 4% and the incidence of low birthweight by 1.3-2.7%.
Crémieux P-Y, Ouellette P, Pilon C. "Health Care Spending as Determinants of Health Outcomes." <i>Health Economics</i> , 1999, 8: 627-39.	Gender-specific infant mortality in Canadian provinces, 1978-1992.	Higher per capita medical spending and greater physician availability are both significantly related to lower infant mortality rates; a 10% higher level of spending is associated with 0.4-0.5% lower mortality rates.
Hadley J. <i>More Medical Care, Better Health? An Economic Analysis of Mortality Rates</i> . Washington D.C.: The Urban Institute Press, 1982.	Infant mortality rates by race and sex across geographic areas in 1970	Ten percent higher medical care spending per capita associated with 1.5 to 2.0% lower infant mortality rates.
Moss NE, Carver K. "The Effect of WIC and Medicaid on Infant Mortality in the United States." <i>American Journal of Public Health</i> , September 1998, 88(9): 1354-61.	Neonatal mortality	Compared to privately insured, uninsured babies had higher relative odds of dying (RO=1.4-1.8)

STUDY	OUTCOME	RESULTS*
AVOIDABLE HOSPITAL STAYS		
Kozak LJ, Hall MJ, Owings MF. "Trends in Avoidable Hospitalizations." <i>Health Affairs</i> , March/April 2001, 20(2): 225-32.	Avoidable hospitalization rates, 1980 - 1998	Compared to privately insured, the relative rate of avoidable hospitalizations for self-pay patients has increased over time, from 24.3% in 1980 to 54.6% in 1998 (11.6% compared to 7.5% avoidable).
Pappas G, Hadden WC, Kozak LJ, Fisher GF. "Potentially Avoidable Hospitalizations: Inequalities in Rates Between US Socioeconomic Groups." <i>American Journal of Public Health</i> , May 1997, 87(5): 811-6.	Avoidable hospitalization rate, 1990	Compared to privately insured, uninsured had a 30% higher rate (13% compared to 10%).
Hoffman C, Gaskin DJ. <i>The Costs of Preventable Hospitalizations among Uninsured and Medicaid Adults</i> . Washington DC: Kaiser Family Foundation, 2001.	Cost of an avoidable hospital stay	Average cost of an avoidable hospital stay for an uninsured adult was \$3,300 in 2002.
HEALTH AND INCOME		
Chirikos TN, Nestel G. "Further Evidence on the Economic Effects of Poor Health." <i>The Review of Economics and Statistics</i> , 1985, 67: 61-9.	Annual earnings, 1976-1977	Compared to those in continuously good health, those in poor health earned less, depending on race and sex: white men (20.7%), black men (22.3%), white women (12.5%), and black women (27.8%)
Fronstin P, Holtmann AG. "Productivity Gains from Employment-Based Health Insurance." in: Fronstin P, editor. <i>The Economic Costs of the Uninsured: Implications for Business and Government</i> . Washington D.C.: Employee Benefit Research Institute, 2000: 25-39. and Fronstin P, Holtmann AG. "Workers and Access to Health Care: Consequences of Being Uninsured." EBRI-ERF Policy Forum. Employee Benefit Research Institute, May 3, 2000.	Annual earnings, 1998	Compared to those in good health, full-time workers in bad health earned from 6.2 to 18.1% less (average 11.3% less), depending on sex and firm size.



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