



# The Health Insurance Experiment

## A Classic RAND Study Speaks to the Current Health Care Reform Debate

After decades of evolution and experiment, the U.S. health care system has yet to solve a fundamental challenge: delivering quality health care to all Americans at an affordable price. In the coming years, new solutions will be explored and older ideas revisited. One idea that has returned to prominence is cost sharing, which involves shifting a greater share of health care expense and responsibility onto consumers. Recent public discussion of cost sharing has often cited a landmark RAND study: the Health Insurance Experiment (HIE). Although it was completed over two decades ago, in 1982, the HIE remains the only long-term, experimental study of cost sharing and its effect on service use, quality of care, and health. The purpose of this research brief is to summarize the HIE's main findings and clarify its relevance for today's debate. Our goal is not to conclude that cost sharing is good or bad but to illuminate its effects so that policymakers can use the information to make sound decisions.

### Learning from Experiment: Conducting the HIE

In the early 1970s, financing and the impact of cost sharing took center stage in the national health care debate. At the time, the debate focused on free, universal health care and whether the benefits would justify the costs. To inform this debate, an interdisciplinary team of RAND researchers designed and carried out the HIE, one of the largest and most comprehensive social science experiments ever performed in the United States.

### Key findings:

- In a large-scale, multiyear experiment, participants who paid for a share of their health care used fewer health services than a comparison group given free care.
- Cost sharing reduced the use of both highly effective and less effective services in roughly equal proportions. Cost sharing did not significantly affect the quality of care received by participants.
- Cost sharing in general had no adverse effects on participant health, but there were exceptions: free care led to improvements in hypertension, dental health, vision, and selected serious symptoms. These improvements were concentrated among the sickest and poorest patients.

The HIE posed three basic questions:

- How does cost sharing or membership in an HMO affect use of health services compared to free care?
- How does cost sharing or membership in an HMO affect appropriateness and quality of care received?
- What are the consequences for health?

The HIE was a large-scale, randomized experiment conducted between 1971 and 1982. For the study, RAND recruited 2,750 families encompassing more than 7,700 individuals, all of whom were under the age of 65. They were chosen from six sites across the

RAND RESEARCH AREAS  
 THE ARTS  
 CHILD POLICY  
 CIVIL JUSTICE  
 EDUCATION  
 ENERGY AND ENVIRONMENT  
 HEALTH AND HEALTH CARE  
 INTERNATIONAL AFFAIRS  
 NATIONAL SECURITY  
 POPULATION AND AGING  
 PUBLIC SAFETY  
 SCIENCE AND TECHNOLOGY  
 SUBSTANCE ABUSE  
 TERRORISM AND HOMELAND SECURITY  
 TRANSPORTATION AND INFRASTRUCTURE  
 WORKFORCE AND WORKPLACE

This product is part of the RAND Corporation research brief series. RAND research briefs present policy-oriented summaries of individual published, peer-reviewed documents or of a body of published work.

Corporate Headquarters  
 1776 Main Street  
 P.O. Box 2138  
 Santa Monica, California  
 90407-2138  
 TEL 310.393.0411  
 FAX 310.393.4818

© RAND 2006

www.rand.org

United States to provide a regional and urban/rural balance. Participants were randomly assigned to one of five types of health insurance plans created specifically for the experiment. There were four basic types of fee-for-service plans: One type offered free care; the other three types involved varying levels of cost sharing—25 percent, 50 percent, or 95 percent coinsurance (the percentage of medical charges that the consumer must pay). The fifth type of health insurance plan was a nonprofit, HMO-style group cooperative. Those assigned to the HMO received their care free of charge. For poorer families in plans that involved cost sharing, the amount of cost sharing was income-adjusted to one of three levels: 5, 10, or 15 percent of income. Out-of-pocket spending was capped at these percentages of income or at \$1,000 annually (roughly \$3,000 annually if adjusted from 1977 to 2005 levels), whichever was lower. The 95 percent coinsurance plan in the study closely resembled the high-deductible catastrophic plans being discussed today.

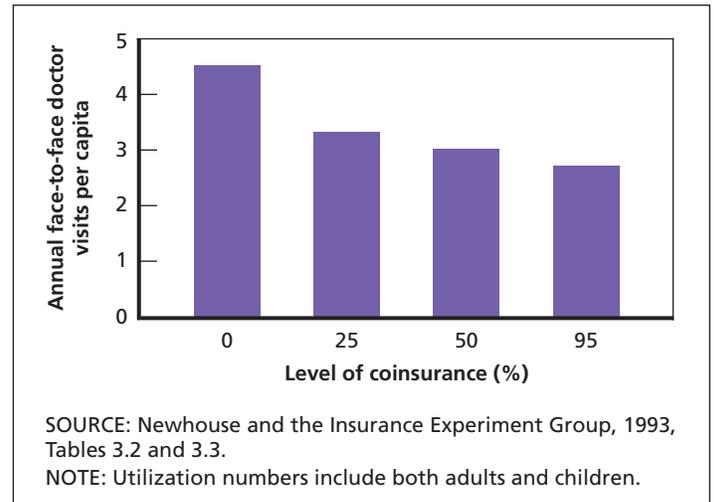
Families participated in the experiment for 3–5 years. The upper age limit for adults at the time of enrollment was 61, so that no participants would become eligible for Medicare before the experiment ended. To assess participant service use, costs, and quality of care, RAND served as the families’ insurer and processed their claims. To assess participant health, RAND administered surveys at the beginning and end of the experiment and also conducted comprehensive physical exams. Sixty percent of participants were randomly chosen to receive exams at the beginning of the study, and all received physicals at the end. The random use of physicals at the beginning was intended to control for possible health effects that might be stimulated by the physical exam alone, independent of further participation in the experiment.

### Effects on Use of Health Services

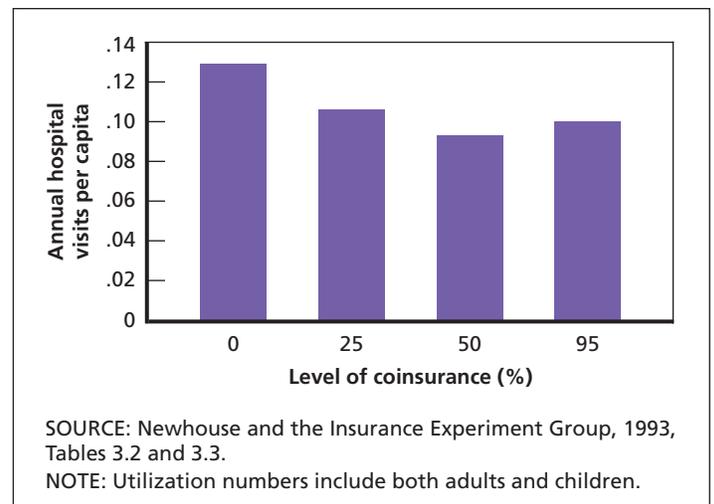
The results showed that cost sharing reduced the use of nearly all health services. Specifically,

- Averaged across all levels of coinsurance, participants (including both adults and children) with cost sharing made one to two fewer physician visits annually and had 20 percent fewer hospitalizations than those with free care. Declines were similar for other types of services as well, including dental visits, prescriptions, and mental health treatment (see Figures 1 and 2).
- Consumers in the HMO-style cooperative had 39 percent fewer hospital admissions than consumers with free care in the fee-for-service system, but they had similar use of outpatient services. Spending reductions under the HMO plan were comparable to the effects of a higher rate of coinsurance in the fee-for-service system.

**Figure 1**  
Participants with Cost Sharing Visited the Doctor Less Frequently



**Figure 2**  
... and Were Admitted to Hospitals Less Often

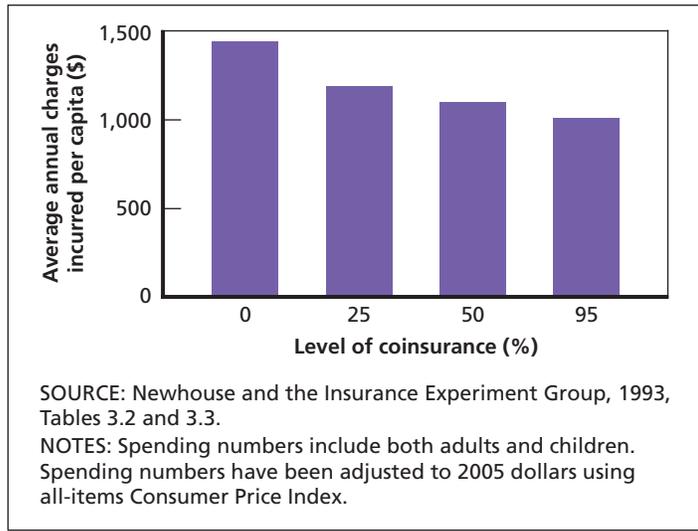


- Participants in cost sharing plans spent less on health care; this savings came from using fewer services rather than finding lower prices. Those with 25 percent coinsurance spent 20 percent less than participants with free care, and those with 95 percent coinsurance spent about 30 percent less (see Figure 3).
- Reduced use of services resulted primarily from participants deciding not to initiate care. Once patients entered the health care system, cost sharing only modestly affected the intensity or cost of an episode of care.

### Effects on Appropriateness of Care and on Quality of Care

The analysis also examined the appropriateness of the services reduced by cost sharing and the technical quality of care

**Figure 3**  
**Participants with Cost Sharing Spent Less on Health Care Services**



received by participants. Did cost sharing deter participants from seeking appropriate care to a greater or lesser extent than it deterred ineffective care? To answer this question, analysts grouped specific conditions into seven categories according to the degree to which outpatient care and therapies were known to be effective in treating each condition. The categories ranged from conditions for which care is highly effective to conditions for which care is rarely effective.

The analysis found that cost sharing reduced the use of effective and less-effective care across the board (see the table). For hospitalizations and prescription drug use, cost sharing likewise reduced more-effective and less-effective care in roughly equal amounts for all participants. The proportion of inappropriate hospitalizations was the same (23 percent) for cost-sharing and free-plan participants, as was the inappropriate use of antibiotics.

In addition to measuring the appropriateness of care sought by patients, the experiment measured the quality of care delivered. Analysts constructed process measures of the quality of ambulatory and dental care received by HIE participants. The process measures dealt with the appropriate use of visits and diagnostic tests by providers and the appropriate use of therapeutic interventions after participants sought care.

Two striking findings emerged: First, cost sharing did not significantly affect the quality of care received by participants. Clinically meaningful differences between the free plan and cost sharing plans appeared only for the process criteria dealing with the need for an office visit: 59 percent for free-plan participants versus 52 percent for those under

cost-sharing. Second, the overall level of quality for process measures was surprisingly low for all participants: criteria for quality were met only 62 percent of the time. These results were discouraging at the time. What is more, recent RAND work found that health care quality may not have improved significantly in the interim. Results of a 2003 nationwide study showed that quality criteria were met only 55 percent of the time.<sup>1</sup> Thus, despite tremendous technical progress that raises the potential value of care received, quality of care as a proportion of the best possible care has not improved in the past 20 years.

### Effects on Health

In general, the reduction in services induced by cost sharing had no adverse effect on participants' health. However, there were exceptions. The poorest and sickest 6 percent of the sample at the start of the experiment had better outcomes under the free plan for 4 of the 30 conditions measured.

Specifically,

- Free care improved the control of *hypertension*. The poorest patients in the free care group who entered the experiment with hypertension saw greater reductions in blood pressure than did their counterparts with cost sharing. The projected effect was about a 10 percent reduction in mortality for those with hypertension.
- Free care marginally improved *vision* for the poorest patients.
- Free care also increased the likelihood among the poorest patients of receiving needed *dental care*.
- *Serious symptoms*<sup>2</sup> were less prevalent for poorer people on the free plan.
- Cost sharing also had some beneficial effects. Participants in cost sharing plans worried less about their health and had fewer restricted-activity days (including time spent in seeking medical care).

Likewise, patient satisfaction, another outcome of interest, was generally high and did not vary at different levels of cost sharing among the fee-for-service plans. While health outcomes at the HMO were no different than outcomes for those with free care, patient satisfaction was lower among participants initially assigned to the HMO. These partici-

<sup>1</sup> For a summary of this work, see "The First National Report Card on Quality of Health Care in America," RB 9053-2, available at [http://www.rand.org/pubs/research\\_briefs/RB9053-2/](http://www.rand.org/pubs/research_briefs/RB9053-2/).

<sup>2</sup> Defined as chest pain when exercising, bleeding (other than nosebleed or menstrual period) not caused by accident or injury, loss of consciousness, shortness of breath with light exercise of work, and weight loss of more than ten pounds (except when dieting).

**Cost Sharing Reduced the Use of Medical Services at all Levels of Effectiveness**

Medical Effectiveness Category	Predicted Percentage of Participants with at Least One Episode of Care in a Single Year, by Medical Effectiveness Category and Plan			
	Adults		Children	
	Free Care	Cost Sharing	Free Care	Cost Sharing
Highly effective				
Acute	28	19	32	23
Acute/chronic	17	13	19	16
Chronic	13	11	4	2
Quite effective	23	18	22	18
Less effective	25	19	13	10
Rarely effective	11	7	5	3
Rarely effective but equally effective with self-care or doctor	39	29	36	24

SOURCE: Lohr et al., 1986, p. 34.

NOTE: Percentages refer to participants who had at least one episode of care within the relevant diagnostic categories during a year of the experiment.

pants were less satisfied with care overall than either those who had previously chosen to be in the HMO or those who remained in the fee-for-service system.

Finally, the experiment examined whether shouldering more of their own health care costs leads people to take better care of themselves. It did not. Risky behaviors were not affected—rates of smoking and obesity, for instance, did not change.

**Implications for Today’s Health Care Reform Discussion**

Today’s health care environment differs in fundamental ways from the one in which the HIE took place. The science of medicine has changed across all dimensions. Managed care has become more prominent, as has prescription drug use. Doctors emphasize preventive care to a greater extent and know more about providing it. Given these and many other systemic changes, it is impossible to know whether a similar experiment undertaken today would produce similar results.

It is possible to take two contrasting perspectives on the HIE’s relevance to today’s health care debate. On the one hand, the study raises the possibility that cost sharing can be adapted to help achieve fundamental goals: containing costs and reducing waste without damaging health or quality of care. Would pairing some form of cost sharing and managed care allow us to exploit cost sharing’s benefits (reduced costs and unnecessary care, small overall health effects) while avoiding its negatives (reduction in needed care, some health effects for poorer and sicker patients)? The study suggested that cost sharing should be minimal or nonexistent for the poor, especially those with chronic disease.

On the other hand, the HIE showed that cost sharing can be a blunt tool. It reduced both needed and unneeded health services. Indeed, subsequent RAND work on appropriateness of care found that economic incentives by themselves do not improve appropriateness of care or lead to clinically sensible reductions in service use.<sup>3</sup>

In addition, cost sharing may not address the principal causes of cost growth. Cost sharing cuts expenditures by reducing visits but has little effect on the cost of treatment once care is sought. If, as is widely believed, cost increases are driven by treatment expense and new technologies, cost sharing can contribute to reducing costs at each point in time but may have little effect on the overall rate of cost growth.

Testing the effects of cost sharing in today’s environment and determining its usefulness as a tool for health system reform would require another large-scale demonstration. To our knowledge, no such demonstration has been conducted since the HIE. However, important nonexperimental work has been done in the interim using the HIE’s findings on the effect of cost sharing in more targeted insurance plans. A recent series of RAND studies showed that cutting prescription co-payments for patients who needed cholesterol-lowering drugs the most could improve their health and save more than \$1 billion annually in medical costs by increasing adherence and reducing the chance of hospitalization.<sup>4</sup> In

<sup>3</sup> For a summary of this work, see “Assessing the Appropriateness of Care: How Much Is Too Much?” RB-4522, available at [http://www.rand.org/pubs/research\\_briefs/RB4522](http://www.rand.org/pubs/research_briefs/RB4522).

this instance, reduced cost sharing led to greater savings and improved health.

As health reform reenters the national policy dialogue, RAND Health is once again providing a framework and objective analysis to inform the evaluation of options. The Comprehensive Assessment of Reform Efforts (COMPARE) initiative is developing a multidimensional framework within which a variety of proposed solutions to the problems in the U.S. health care system can be evaluated. RAND Health will use a variety of analytic tools including micro-simulation to explore the expected performance of the health care system over the next two decades in the absence of significant policy change (i.e., establish a base case). Proposals for change will be evaluated in comparison to the base case. This work continues the role that RAND Health began with the HIE by providing the facts and analysis necessary for informing health policy. ■

---

<sup>4</sup> For a summary of this work, see “Cutting Drug Co-Payments for Sicker Patients on Cholesterol-Lowering Drugs Could Save a Billion Dollars Every Year,” RB-9169, available at [http://www.rand.org/pubs/research\\_briefs/RB9169](http://www.rand.org/pubs/research_briefs/RB9169).

### **This Research Highlight summarizes key findings from the RAND Health Insurance Experiment**

Robert H. Brook et al. “Quality of Ambulatory Care: Epidemiology and Comparison by Insurance Status and Income.” *Medical Care*, May 1990, Vol. 28, No. 5, pp. 392–433.

Robert H. Brook, John E. Ware, William H. Rogers, Emmett B. Keeler, Allyson Ross Davies, Cathy Donald Sherbourne, George A. Goldberg, Kathleen N. Lohr, Patti Camp, and Joseph P. Newhouse. *The Effect of Coinsurance on the Health of Adults: Results from the RAND Health Insurance Experiment*. Santa Monica, Calif.: RAND Corporation, R-3055-HHS, December 1984.

Emmett B. Keeler. “Effects of Cost Sharing on Use of Medical Services and Health.” *Medical Practice Management*, Summer 1992, pp. 317–321. Available online at <http://www.rand.org/pubs/reprints/RP1114/index.html>.

Kathleen N. Lohr, Robert H. Brook, Caren J. Kamberg, George A. Goldberg, Arleen Leibowitz, Joan Keesey, David Reboussin, and Joseph P. Newhouse. *Use of Medical Care in the RAND Health Insurance Experiment: Diagnosis- and Service-Specific Analyses in a Randomized Controlled Trial*. Santa Monica, Calif.: RAND Corporation, R-3469-HHS, December 1986.

Joseph P. Newhouse and the Insurance Experiment Group. *Free for All? Lessons from the RAND Health Experiment*. Cambridge, Mass.: Harvard University Press, 1993.

Bibliographical note: Work on the HIE began in 1973 and ended in 1982. The study led to over 300 publications, including journal articles, reports, and books. For a comprehensive bibliography of HIE-related publications, see <http://www.rand.org/health/projects/hie/hiepubs.html>.

---

Abstracts of all RAND Health publications and full text of many research documents can be found on the RAND Health web site at [www.rand.org/health](http://www.rand.org/health). The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. RAND® is a registered trademark.

**RAND Offices** Santa Monica, CA • Washington, DC • Pittsburgh, PA • Jackson, MS • Doha, QA • Cambridge, UK



# HEALTH

THE ARTS  
CHILD POLICY  
CIVIL JUSTICE  
EDUCATION  
ENERGY AND ENVIRONMENT  
HEALTH AND HEALTH CARE  
INTERNATIONAL AFFAIRS  
NATIONAL SECURITY  
POPULATION AND AGING  
PUBLIC SAFETY  
SCIENCE AND TECHNOLOGY  
SUBSTANCE ABUSE  
TERRORISM AND  
HOMELAND SECURITY  
TRANSPORTATION AND  
INFRASTRUCTURE  
WORKFORCE AND WORKPLACE

This PDF document was made available from [www.rand.org](http://www.rand.org) as a public service of the RAND Corporation.

This product is part of the RAND Corporation research brief series. RAND research briefs present policy-oriented summaries of individual published, peer-reviewed documents or of a body of published work.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

---

## Support RAND

[Browse Books & Publications](#)

[Make a charitable contribution](#)

## For More Information

Visit RAND at [www.rand.org](http://www.rand.org)

Explore [RAND Health](#)

View [document details](#)

## Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use.