

American Health Policy: Cracks in the Foundation

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Abstract Much American health policy over the past thirty-five years has focused on reducing the additional health care that is consumed when a person becomes insured, that is, reducing moral hazard. According to conventional theory, *all* of moral hazard represents a welfare loss to society because its cost exceeds its value. Empirical support for this theory has been provided by the RAND Health Insurance Experiment, which found that moral hazard—even moral hazard in the form of effective and appropriate hospital procedures—could be reduced substantially using cost-sharing policies with little or no measurable effect on health.

This article critically analyzes these two cornerstones of American health policy. It holds that a large portion of moral hazard actually represents health care that ill consumers would not otherwise have access to without the income that is transferred to them through insurance. This portion of moral hazard is efficient and generates a welfare gain. Further, it holds that the RAND experiment's finding (that health care could be reduced substantially with little or no effect on health) may actually be caused by the large number of participants who voluntarily dropped out of the cost-sharing arms of the experiment. Indeed, almost all of the reduction in hospital use in the cost-sharing plans could be attributed to this voluntary attrition. If so, the RAND finding that cost sharing could reduce health care utilization, especially utilization in the form of effective and appropriate hospital procedures, with no appreciable effect on health is spurious.

The article concludes by observing that the preoccupation with moral hazard is misplaced and has worked to obscure policies that would better reduce health care expenditures. It has also led us away from policies that would extend insurance coverage to the uninsured.

Introduction

The direction of health policy in the United States over the past thirty-five years is well known: increased cost sharing in the form of higher deductibles and coinsurance rates; the “management” of care by utilization reviews, exclusive contracting with certain providers, capitation, and bundling of services; and most recently health savings accounts (HSAs) and “consumer-driven” health care. Less well understood, however, are the foundations of these policies, especially among those who see such policies as mainly restricting access to care. While it might be expected that the foundations of these policies are represented by a diverse set of theoretical and empirical studies from a variety of sources, all pointing in basically the same direction, in actuality health policy rests on a surprisingly small number of landmark studies. These few studies have exerted a disproportionate influence on the thinking of policy makers and have provided the intellectual justification for transforming the health care delivery system of the 1960s and 1970s into the one we have today. Two of these foundational studies are (1) the theoretical analysis of the welfare implications of moral hazard (Pauly 1968; Feldstein 1973) and (2) the RAND Health Insurance Experiment (HIE) findings concerning the health consequences of reducing moral hazard (Manning et al. 1987; Newhouse and the Insurance Experiment Group 1993).

Moral hazard refers to the additional health care that consumers purchase when they are insured. The conventional analysis holds that moral hazard represents a response to the insurance price of health care, which is set artificially low compared to the cost of producing that care (Pauly 1968; Feldstein 1973). In response, consumers change their spending patterns to take advantage of the “bargain” represented by the insurance price, substituting additional health care for other goods and services in their budget. Because its value to consumers is less than its production costs, all this additional health care is inefficient and generates a loss of welfare to society. The implication of this theory is that policies should be invoked to reduce moral hazard and, because this health care is of such low value to consumers, the reduction of moral hazard would have only a small effect on the consumers’ health.

This implication was tested and borne out in the RAND HIE. The RAND HIE, conducted during the late 1970s and early 1980s in six U.S. communities, was the most expensive social experiment ever performed in the United States. It assigned participants at random to insurance plans that differed by cost-sharing parameters: some participants were assigned

to the free fee-for-service (FFS) plan; some were assigned to pay 25 percent of their health care bill with a maximum of \$1,000 in out-of-pocket spending, receiving care for free thereafter; some were assigned to a 50 percent coinsurance policy with the same \$1,000 stop-loss provision; and some were assigned to a 95 percent coinsurance policy with the \$1,000 stop-loss provision. Others were assigned to an “individual deductible” plan with a 95 percent coinsurance rate for outpatient care up to a maximum of \$150 for an individual and \$450 for a family, and a 0 percent coinsurance rate for inpatient care. The lessons of the RAND HIE were (1) participants consumed less health care in plans with cost sharing than in the free FFS plan but (2) this reduction in health care consumption “had little or no measurable effect on the health status of the average adult” (Newhouse and Insurance Experiment Group 1993: 243). The empirical results from the RAND HIE supported the theoretical expectations exactly.

When these two studies—one theoretical and one empirical—were used to understand the cost inflation that was occurring in the U.S. medical sector during the 1970s and 1980s, they suggested that reducing moral hazard would reduce costs without greatly affecting the health of consumers. These studies spawned a preoccupation with moral hazard among many policy analysts and provided the intellectual support for the adoption of policies—cost sharing and managed care—that focused on the reduction of moral hazard, a policy focus that continues today with the current interest in consumer-driven health care and HSAs.

This article presents a critical view of these two foundational studies. First, it suggests that much of the additional health care that consumers purchase when they are insured—that is, much of moral hazard—is actually efficient and welfare increasing: its value to patients exceeds (and often far exceeds, in the case of expensive, life-saving, hospital procedures that patients would not be able to afford without insurance) the cost of providing that care. Second, it suggests that the RAND HIE did not really capture consumers’ willingness to substitute other goods and services for medical care in response to increases in the price of medical care, but instead the study largely captured participants who became ill, dropped out of the experiment, and received the needed medical care under their original insurance policies outside the experiment. Because these participants received treatment outside the RAND experiment, their health care utilization was not recorded. Thus, the finding that moral hazard, especially the portion of moral hazard represented by additional hospital procedures, could be reduced dramatically by cost sharing with only

a negligible health effect is spurious. The discussion of the theoretical model comes first.

The Welfare of Moral Hazard

Conventional Theory

Conventional theory is based on a diagrammatic analysis of the welfare implications of moral hazard (Pauly 1968; Feldstein 1973). This simple illustration has been used by policy analysts of all types—economists and noneconomists alike—to explain what is often touted as the main problem with the U.S. health care system and to justify current policy prescriptions. It is important, therefore, that some effort be devoted to explaining this diagram in order to understand why conventional analysis based on this diagram is wrong.

A demand curve shows the observed relationship between the price of a commodity and the quantity that consumers want to purchase. For most commodities, consumers exhibit a downward-sloping demand curve, meaning that consumers demand more units of the commodity as the price falls. Figure 1 shows the consumer's demand curve for medical care. At a price of P dollars per unit of medical care (P represents a certain price, such as \$100 per office visit), the consumer purchases M_u units of medical care (M_u might represent the quantity of office visits per period of time, such as four visits per year), but at a price of zero, the consumer purchases M_i units of medical care—more care in response to the price reduction. Although it is widely recognized that reality never fully cooperates with theory, a demand curve remains a useful theoretical concept because it allows analysts to focus on the *relationship* between price and the quantity demanded rather than on the exact amounts.

A demand curve is usually read from left to right: pick a price and the demand curve tells the number of units that will be demanded. For example, at price P the demand curve indicates that the quantity that consumers demand is M_u . When analysts need to *evaluate* a commodity that is sold in a market, however, the demand curve can be read backward: pick a certain unit of the commodity and trace up to the demand curve to see the maximum price that consumers are willing to pay for it. From this perspective, the various prices become measures of the value of each unit of medical care because they represent what consumers are willing to pay for each successive unit of medical care. For example, the value of M_u as a single unit of medical care (sometimes expressed as the " M_u th" unit) is P

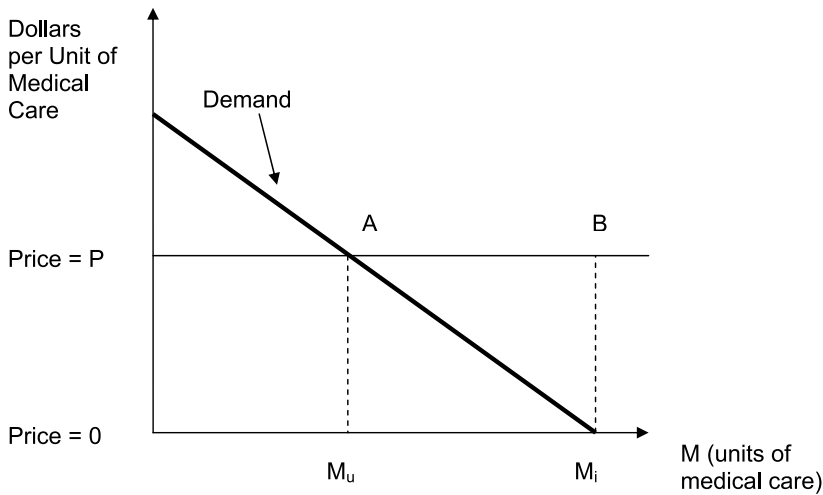


Figure 1 Conventional Analysis of Moral Hazard

dollars in figure 1. In general, the demand curve shows that, as consumers have more and more units of medical care, the value they attach to each additional unit of medical care is lower and lower.

To determine how much the first M_u units of medical care are worth, it is simply necessary to add up the price that some consumer is willing to pay for the first unit, the price some consumer is willing to pay for the second, and so on until one has aggregated the value for all M_u units. The geometry of demand curves translates the value of these units as the area under the demand curve. Thus, if the price were to drop from P to zero because of natural fluctuations in the market, an additional $(M_i - M_u)$ units would be purchased. The value of these $(M_i - M_u)$ units would equal the area under the demand curve, defined by the three points A , M_i , and M_u —that is, area AM_iM_u —in figure 1.

The conventional analysis of moral hazard focuses on the price reduction. When insurance pays for all of a patient's health care, it is interpreted as the price dropping from P to zero. Thus, as a result of becoming insured, consumers will purchase $(M_i - M_u)$ additional units of health care, and the value of this moral hazard is deemed to be the area under the demand curve or area AM_iM_u in figure 1.

With insurance, however, there has not really been a natural reduction in the market price of medical care. Indeed, the market price of medical care remains at P dollars per unit. Instead, the insured person has simply purchased a policy that makes the price zero to her, which is artificially

lower than the market price of P dollars. The insured person consumes more care because she is responding to this price decrease by substituting medical care for other goods and services in her budget, now that medical care is selling at bargain prices. Moreover, it is typically assumed that the market price, P , also represents the cost of producing a unit of medical care, so that it costs P dollars to produce the M_u th unit of medical care, P dollars to produce the M_i th unit, and P dollars to produce each of the units in between. Geometry would capture the total cost of producing the additional medical care consumed because of insurance as area ABM_iM_u .

If the cost of producing the moral hazard is represented by area ABM_iM_u in figure 1 but the value of the moral hazard is represented as the smaller area AM_iM_u , then the cost of producing the moral hazard exceeds its value by area ABM_i . As a result, area ABM_i represents the net loss or inefficiency from consuming the additional health care. Area ABM_i is the measure of the famous moral-hazard welfare loss.

Moral Hazard and Health Policy Prescriptions

The conventional theory of moral-hazard welfare loss has had an important influence on how health insurance is perceived. At the time this theory was published, the accepted theory was captured by Arrow's (1963) influential article, which concluded that the case for insurance of any kind was overwhelming because of the gain from risk avoidance generated by insurance. Pauly's (1968: 534) analysis, however, suggested that this risk-avoidance gain must be weighed against the moral-hazard welfare loss and that the welfare loss might be so large as to swamp the gain from risk avoidance, resulting in a net change in welfare (derived from the purchase or provision of health insurance) that "could well be negative."

Feldstein (1973: 275) estimated the gains and losses based on the conventional theory and concluded that, even though the average coinsurance rate in the United States at the time was estimated to be about 33 percent (taking into account the large percentage of Americans who were uninsured and therefore faced 100 percent coinsurance rates), this rate of health insurance coverage was deemed to be excessive and overall produced a "very substantial welfare loss." He suggested that coinsurance rates should be raised to 67 percent or higher.

Feldstein and Friedman (1977) used the moral-hazard welfare loss from insurance to argue that the tax exemption for employee health insurance premiums was inefficient because it led to coverage among the insured that was too extensive (largely ignoring the beneficial impact of the tax

exemption on increasing the *number* of insured). The inefficiency of the employee insurance tax subsidy became a cause célèbre for health economists during much of the 1980s and 1990s. For example, 361 health economists signed a petition in 1994 calling for the repeal of the tax subsidy on the basis of this theory (Health Policy Consensus Group 1999).¹

Other articles drew similar conclusions regarding the welfare loss caused by excessive health insurance in the United States (Manning et al. 1987; Feldman and Dowd 1991; Manning and Marquis 1996). Various health-economics textbooks published from the 1970s on (beginning with Feldstein 1979) reinforced these views, training generations of health economists to view health insurance as problematic. If health insurance is problematic and may even make consumers and society worse off, then there is also little reason to implement a national health insurance program. As a result, few American health economists during this period called for the creation of a national health insurance program.

The RAND HIE itself was motivated by the attempt to determine the effect of coinsurance payments and deductibles on moral-hazard consumption and to determine, at the same time, to what extent the resulting reductions in health care consumption would affect the health of those involved (Newhouse 1974). Thus, the theoretical basis for the RAND HIE was the conventional theory of moral hazard that suggested that coinsurance rates would reduce moral hazard but that this reduced health care would not be very valuable in terms of its effect on health.

Managed care was primarily a response to the presumed inducement of care by providers who were paid a fee for each service. It is an amorphous concept that consists in practice mainly of utilization review, capitated or otherwise bundled payments to providers, and the selection of low-cost panels of providers. Because managed care also acts to reduce the ability of consumers to respond to lower insured prices, however, many analysts have also viewed managed care as a policy aimed at eliminating moral hazard and its welfare loss (e.g., Pauly and Goodman 1995: 129). Therefore, for many policy analysts, the promotion of managed care was also at least partially motivated by the concept of the moral-hazard welfare loss.

With the advent of this theory, health insurance was transformed from a solution into a problem (Gladwell 2005). Under this theory, insurance could be valuable, but only if one could substantially curb the behavior of

1. Before gaining a better understanding of the theory and empirical evidence, I also signed this petition.

the insured. Otherwise, health insurance would make people worse off. But this perspective did not fit with the intuition shared by many that possessing health insurance was essential for gaining access to care. Specifically, it did not explain why some types of moral hazard—for example, the expensive, life-saving procedures that a person would not be able to afford without health insurance—were clearly so valuable.² Explaining the value of this type of moral hazard required a different theory.

New Theory

The fundamental error in conventional theory is that it did not recognize that, while the price of medical care might drop to zero for all those who are insured, for most medical care—especially the expensive, hospital-based procedures and associated care that comprise the bulk of medical care expenditures in the United States—it is really only those *who are ill* who respond to that price reduction. For example, what *healthy* person would purchase a coronary bypass procedure, a leg amputation, or a liver transplant just because the price has fallen to zero? This means that only those who become ill are responsive to the insurance price reduction. If so, the price reduction becomes the vehicle by which income is transferred from those who purchase insurance and remain healthy to those who purchase insurance and become ill. This is an important distinction because it changes the welfare implications of moral hazard dramatically and implies that much, if not most, of moral hazard is efficient and generates a welfare gain (Nyman 1999, 2003).

For example, suppose Elizabeth has just been diagnosed with breast cancer. If she did not have insurance, she would purchase a \$20,000 mastectomy to rid her body of the cancer. She would consider purchasing a \$20,000 breast reconstruction needed to correct the disfigurement caused by the mastectomy, but without insurance, the competing claims on her income and resources would make it too expensive. If Elizabeth instead purchased a health insurance policy for \$4,000 that paid for all her care, she would purchase the \$20,000 mastectomy plus the \$20,000

2. In 1983, Pauly recognized the limits of the conventional theory. He suggested that the conventional theory of moral-hazard welfare loss applied only to “routine physician’s visits, prescriptions, dental care, and the like” (Pauly 1983: 83). However, he went on to observe that “the relevant theory, empirical evidence, and policy analysis for moral hazard in the case of serious illness has not been developed. This is one of the most serious omissions in the current literature” (83).

breast-reconstruction procedure, both paid for entirely by \$40,000 from the insurance pool.

Under conventional theory, this additional breast-reconstruction procedure represents moral hazard and could only be viewed as reducing welfare, that is, as having a value that is less than its cost because it represents *a movement along the demand curve*. Under the new theory, it is recognized that only those who are ill with breast cancer and have had a mastectomy will be in the market for a breast-reconstruction procedure. Thus, although the breast reconstruction is free to all, only those who are ill respond to the price reduction. Because of this, the price reduction in insurance is the vehicle by which \$40,000 in income is transferred out of the insurance pool to benefit the person who has become ill, in this case, with cancer. So, the important aspect of insurance is that Elizabeth has, in effect, \$40,000 more income (actually, \$36,000 more income after one accounts for the \$4,000 premium she had to pay to be eligible for this payoff) with insurance than without it. If, when she purchases the additional breast reconstruction, Elizabeth is responding to this increase in income rather than to the decrease in price, then moral hazard is a result of *a shifting out of the demand curve* for medical care, and the breast reconstruction (representing the moral hazard) is a welfare gain.

There is a simple test to determine whether moral hazard is a welfare gain or a welfare loss. If we observe that breast-cancer patients purchase \$20,000 worth of medical care without insurance and \$40,000 worth of medical care with standard insurance (insurance that pays for all care), then instead of paying for their care, simply pay the consumer a cashier's check for \$40,000—the amount that the insurance company pays out anyway—at the point at which the consumer is diagnosed with breast cancer and observe her behavior. If she purchases the mastectomy plus the additional \$20,000 breast reconstruction with her income and the \$40,000 cashier's check, then this moral hazard is efficient and represents a welfare gain. This is because she could spend this money on anything of her choosing, but she chooses to purchase the breast reconstruction, so it is worth at least \$20,000 to her. If so, the additional \$20,000 breast reconstruction is a response to the additional income and not to the reduction in price, and this makes the moral hazard efficient. If she would not purchase the additional \$20,000 breast reconstruction with her income plus the \$40,000 cashier's check, then the moral hazard is a response to price and is inefficient for the reasons suggested by conventional theory.

Admittedly, this test would be difficult to apply in practice. Nevertheless, because we can easily imagine that some patients would purchase the same

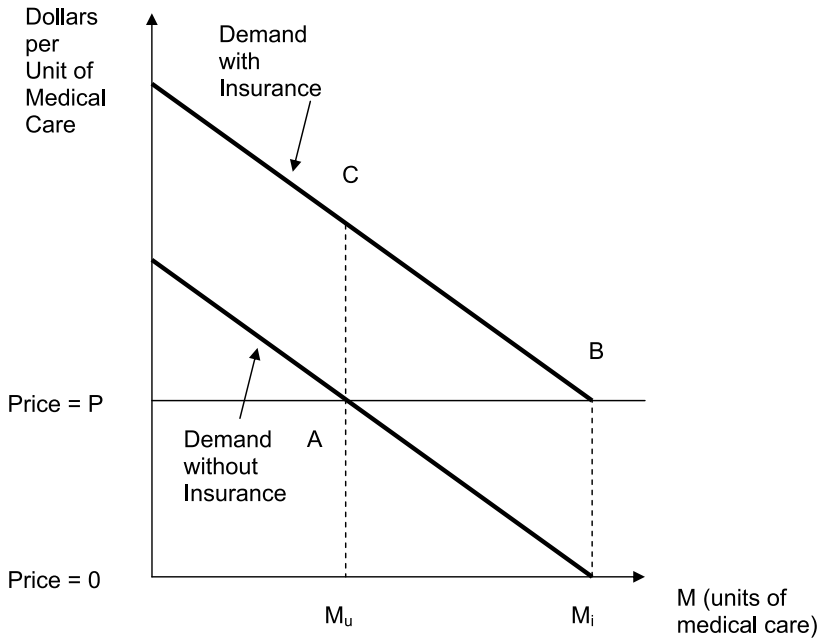


Figure 2 New Analysis of Moral Hazard

\$20,000 breast reconstruction with this \$36,000 income transfer as they would with standard insurance that pays for all their care, then it shows that standard insurance can act to increase willingness to pay and shift the demand curve outward. The intuition behind this distinction is that moral hazard is not always simply a substitution of health care for other consumer goods and services in response to bargain health care prices, as conventional theory assumes. Instead, insurance often provides access to needed and valuable care that would otherwise be unaffordable.

Figure 2 shows the welfare effect of moral hazard under the new theory, assuming a case in which insurance works only to increase willingness to pay and to shift out of demand. The value of the additional health care is measured by the area under a new demand curve, one that is based on the medical care that a patient would be willing to pay for and purchase at different prices but with the additional income transferred to them by insurance. Because of this increase in income, the patient is assumed to purchase the same ($M_i - M_u$) additional units of medical care, representing the same moral hazard as in figure 1. However, with the new demand curve, the value of this additional care is now area CBM_iM_u in figure 2,

the area under the new demand curve. It costs the same amount, ABM_1M_u , to produce this additional health care, but because the value of the health care now exceeds its costs, the moral hazard generates a welfare *gain* equal to area CBA.

Note that this is a case where insurance works *only* to shift out demand. Sometimes, insurance will generate both efficient and inefficient responses. For example, Elizabeth might spend \$20,000 on health care (a mastectomy) without insurance and spend \$44,000 on health care with insurance that pays for all her care, because she purchases the \$20,000 mastectomy, the additional \$20,000 breast reconstruction, and an extra two days recovering in the hospital, costing the insurer another \$4,000. If the insurer had simply given her a check for \$44,000 upon diagnosis that she could spend on anything of her choosing, she might have purchased the \$20,000 breast reconstruction in addition to the mastectomy but not the extra two days in the hospital for \$4,000. She simply would have made do with the standard hospital recovery period because the extra two days in the hospital were not worth her spending \$4,000 of her own money. In this case, moral hazard has both an efficient portion (the \$20,000 breast reconstruction) and an inefficient portion (the \$4,000 for two extra days in the hospital). This would, of course, require a different diagram to illustrate.

In summary, the new analysis implies that while some of moral hazard produces a welfare loss, much of moral hazard produces a welfare gain. Recategorizing a portion of moral hazard as increasing welfare, instead of decreasing it, causes a dramatic increase in the value of health insurance (recall that under the conventional theory all moral hazard was deemed to reduce welfare). I have estimated that the moral hazard that would be generated by insuring the approximately 40 million uninsured in the United States would create over \$2,000 worth of benefits in excess of costs per person who becomes insured (Nyman 2003). This result was reinforced by another recent article using a similar estimation procedure (Miller, Vigdor, and Manning 2004).³ It also means that, in contrast to conventional analysis, the voluntary purchase of health insurance makes the consumer better off. It implies that applying coinsurance rates to all health care is too blunt a policy instrument: coinsurance rates and other cost-sharing policies should be applied only to inefficient moral hazard,

3. Miller, Vigdor, and Manning (2004) calculate that the conventional risk-avoidance gain represents only about 2.5 percent of the total gain from insurance, the bulk of the gain being derived from the health benefits associated with the additional health care consumed when insured, that is, the moral hazard.

a much harder task. But most of all, it implies that the preoccupation of policy analysts with reducing moral hazard has been and is misplaced.

Lessons of the RAND Health Insurance Experiment

Conventional Interpretation

The RAND HIE is considered by many to be the gold standard in describing the effect of cost sharing on the use of health care, and the effect of cost sharing on the health of insured individuals. The impetus for a *randomized experiment* came from the ambiguity of the early empirical studies that used observational data and found that insurance led to greater health care use. It was not known whether the increased use was because of (1) consumers responding to the low insurance price (in accordance with the conventional moral-hazard model) or (2) consumers who, upon recognizing that they were likely to become or be ill, purchased insurance and then used more health care because they were *ill*, not because they were insured. That is, in both cases, insurance would lead to additional consumption of medical care, but it was the first effect that the RAND HIE was intended to isolate and measure.

The RAND HIE isolated this effect by randomly assigning participants to the various arms distinguished by the cost-sharing provisions faced by the participants. By randomly assigning participants, the authors of the HIE thought they could assure that ill participants would not systematically end up in the more generous cost-sharing arms. If so, the HIE would then purely capture the effect of varying the coinsurance rates on health care use. For example, the RAND HIE found that 10.3 percent of those adults randomized into the free FFS plan had at least one inpatient stay annually, while only 7.9 percent of those randomized into the 95 percent coinsurance (with the \$1,000 out-of-pocket maximum) plan had at least one inpatient stay, a reduction of about 23 percent from the free FFS inpatient use rate (Newhouse and the Insurance Experiment Group 1993: 41, table 3.2). This reduced hospital utilization contributed substantially to the overall reduction in expenditure, explaining over 40 percent of the reduction in expenditures between the free FFS plan and the 95 percent coinsurance plan.

However, when participants were given a battery of physical examinations, diagnostic tests, and health-status questionnaires, the reduction in medical-care consumption that appeared to be caused by cost sharing produced only a small decrease in hypertension control and in far-vision correction (compared to free FFS coverage), and this decrease was concen-

trated among those low-income enrollees with elevated risk (Brook et al. 1983; Newhouse and the Insurance Experiment Group 1993). No evidence of a broad health effect—such as a decline in general health status—was detected. Again, these results led researchers to conclude that “the increase in services on the free-care plan had little or no measurable effect on health status for the average adult” (Newhouse 1993: 243). The central lesson of the RAND HIE was, therefore, that cost-sharing policies could be used to reduce the excessive health care expenditures generated by insurance—for example, hospital admissions by almost one-quarter—and there would be no important reductions in health as a consequence.

It should be pointed out that the conventional interpretation of the RAND HIE results was based on the presumption of substitutability. Those participants who faced a low price of medical care because they were insured were assumed to have substituted medical care for other goods and services, simply because the price had dropped to bargain levels. Theoretically, this applied to all consumers, not just to those who were ill. Those participants who faced a price of medical care that was closer to the actual market price because of cost sharing would substitute away from medical care, purchasing a mix of medical care and other goods and services that contained less medical care. But forgoing this medical care had only a negligible effect on the consumer’s health, consistent with the implication of the substitutability presumption that the additional medical care purchased because of insurance (or forgone when insurance co-payments were applied) would be of relatively little value to the consumer.

New Interpretation

Of the various responses to cost sharing that were observed in the participants of the RAND HIE, by far the strongest and most dramatic was in the relative number of RAND participants who voluntarily dropped out of the study over the course of the experiment. Of the 1,294 adult participants who were randomly assigned to the free plan, 5 participants (0.4 percent) left the experiment voluntarily during the observation period, while of the 2,664 who were assigned to any of the cost-sharing plans, 179 participants (6.7 percent) voluntarily left the experiment.⁴ This represented a greater

4. A similarly large percentage differential was observed in the children who voluntarily dropped out of the study. Separately, a large percentage differential was also observed in those who refused to participate in the experiment upon being assigned to the cost-sharing plans compared to those assigned to the free FFS plan, but this refusal differential was not part of the voluntary dropout (attrition) differential presented here (Newhouse and the Insurance Experiment Group 1993).

than sixteenfold increase in the percentage of dropouts, a difference that was highly significant and a magnitude of response that was nowhere else duplicated in the experiment. What explains this?

The explanation that makes the most sense is that the dropouts were participants who had just been diagnosed with an illness that would require a costly hospital procedure. Rather than paying what was likely to be the maximum cost-sharing amount, which could be as much as \$1,000 then (or more than \$4,000 in today's dollars, according to the increase in the consumer price index between 1974, the first year of the RAND experiment, and 2006), many of the cost-sharing participants chose to drop out of the experiment. If they dropped out, their coverage would automatically revert to their original insurance policies, which were likely to cover major medical expenses (such as hospitalizations) with no co-payments (Newhouse and the Insurance Experiment Group 1993: 402). This is because HIE participants had agreed to relinquish their existing policies to RAND as a condition of participation, but they could revert back to their existing policies whenever they wanted if they dropped out of the experiment. Thus, when faced with a large hospital expense, the participants could have simply dropped out of the experiment but received the inpatient care outside the experiment.

As a result of dropping out, these participants' inpatient stays (and associated health care spending) did not register in the experiment, and it appeared as if participants in the cost-sharing group had a lower rate of inpatient use.⁵ In reality, however, this finding would have been because participants who remained in the cost-sharing group simply had fewer diagnoses that required hospitalization. Because of this, the cost-sharing participants who remained exhibited a lower rate of inpatient use than free FFS participants, not because they were responding to the higher coinsurance rate by forgoing frivolous hospital care but instead because they did not need as much hospital care, since many of those who became ill and needed hospital care had already dropped out of the experiment before their hospitalization occurred. In other words, the attrition of a portion of the hospitalized meant that a disproportionate number of participants who did not need to be hospitalized had been selected into the cost-sharing

5. No data were collected on the health status or health expenditures of erstwhile participants after they left the experiment (Newhouse and the Insurance Experiment Group 1993). The data for determining health status would have been collected periodically during the course of the experiment. As a result, a participant could have been diagnosed with an illness requiring a hospital procedure and then have dropped out of the experiment without any change in health status being recorded in the RAND data.

arms despite the randomization. That is, randomization might have prevented selection at enrollment, but it did not prevent selection at diagnosis.

With regard to health effects, those in the cost-sharing arms had, on average, similar health-status scores as those in the free FFS arm, because both were receiving the same level of inpatient care *given their health statuses*. This implies that if those who had dropped out had actually stayed in the experiment but had not received the inpatient care that they had received outside the experiment, the cost-sharing group would likely have exhibited a marked decrease in many of the important measures of health. In other words, if the conventional interpretation of the RAND HIE results had actually obtained and there were a 23 percent decline in hospitalizations among the 95 percent coinsurance group, it would likely have generated a commensurate and observable decline in health in that group.⁶

This alternative explanation is plausible because the empirical literature abounds with evidence that consumers switch plans in response to perceived favorable health-plan characteristics and anticipated hospitalizations. For example, Buchmueller and Feldstein (1996) found that consumers switch health plans in response to changes in premiums. Morgan et al. (2000) reported that the rate of total hip arthroplasty or osteoarthritis-related knee replacements was 3.5 to 4 times greater among those who switched from health maintenance organization (HMO) to FFS Medicare, suggesting that individuals anticipate hospitalizations and switch to more favorable plans as a result. Anticipated maternity care was associated with plan switching in a study by Robinson, Gardner, and Luft (1993). Increases in Medicare hospital expenditures among plan switchers were found by Call et al. (2001). Morgan et al. (1997) found that Medicare beneficiaries who switched to the more favorable FFS plans were 80 percent more likely to have a hospitalization than those who were already in an FFS plan. Thus, it would be reasonable to expect some RAND participants to respond to anticipated hospitalizations and the prospect of co-payments of as much as \$4,000 (in today's dollars) by switching to the more favorable coverage of their original insurance plans.

The criticism that too many participants in the RAND experiment

6. However, if those who dropped out had stayed in the experiment and received the hospitalizations, then the RAND experiment would have likely shown no change in either the hospitalization rate or health outcomes as a result of cost sharing. This result would have been inconsistent with conventional theory, because it would have indicated that consumers are not responsive to price for some medical care procedures—hospitalizations—because they are too important and necessary for maintaining health.

had dropped out of the cost-sharing arm has been raised before but not with this interpretation (Welch et al. 1987). In response, Newhouse et al. (1987) and Newhouse and the Insurance Experiment Group (1993) argued that RAND researchers were unable to detect any differences in the self-reported health status of dropouts before they left the experiment.⁷ But it is possible and even likely that participants could have had their health status evaluated as part of the periodic surveys and then received an unfavorable diagnosis and dropped out of the experiment, all before their change in health status could be registered in another periodic health-status survey.

Newhouse et al. (1987) and Newhouse and the Insurance Experiment Group (1993) argued that the participation incentive—the payments that participants received just for staying with the experiment—would have resulted in the elimination of any financial incentive to leave the experiment early. In most cases, however, this participation incentive worked to reduce the incentive to drop out but did not eliminate it. Indeed, the sixteenfold increase in voluntary attrition among those in the cost-sharing plans (compared to those in the free FFS plan) is convincing evidence that the participation incentive simply did not work. To my knowledge, RAND researchers have yet to present a benign explanation for this large and statistically significant voluntary attrition rate differential.

The data reported in Newhouse and the Insurance Experiment Group (1993) suggest that these dropouts could explain almost all of the difference in hospital use observed between the free FFS and the cost-sharing plans. It is reported that the annual rate of any inpatient use fell from 10.3 percent of participants in the free FFS plan to 7.9 percent of participants in the 95 percent coinsurance plan (Newhouse and the Insurance Experiment Group 1993: 41, table 3.2). Because some cost-sharing plans experienced a smaller drop in this percentage and some a larger drop, 7.9 percent can be used as a reasonable point estimate of the drop in inpatient use due to cost sharing. This suggests that if the 2,340 adult participants who finished the experiment in *all of the cost-sharing plans* were instead placed in the free FFS plan, there would be about 56 more participants with hospital admissions each year (table 1). This number represents the reduction in hospital patients in the cost-sharing arm that is allegedly caused by cost sharing each year.

Compare this number to the number of voluntary dropouts. There were 174 more voluntary dropouts among the adult participants in the cost-

7. Again, no health-status or utilization data were collected on the dropouts after they left the experiment.

Table 1 Estimates of the Effect of Cost Sharing on the Number of RAND Participants with Any Hospitalization and on the Number of Participants Who Left the Experiment Voluntarily

	Free Fee for Service	Cost Sharing
Adult Participants Who Completed HIE	1,225	2,340
Rate of Any Inpatient Use	10.3%	7.9%
Adults with Any Inpatient Use in a Year	126	185
Adults with Any Inpatient Use in a Year Assuming a 10.3% Use Rate	126	241
Annual Reduction in Hospital Patients in Cost-Sharing Arm Allegedly Due to Cost Sharing	—	56
Total Voluntary Attrition by Adult Participants	5	179
Total Attrition Differential	—	174
Annual Reduction in Adult Participants in the Cost-Sharing Arm Due to Voluntary Attrition	—	50

sharing plans than in the free FFS plan. On average, a participant in the RAND HIE spent about 3.5 years in the study. If the same number of patients dropped out each year over the 3.5 years, then about 50 participants dropped out each year (table 1). Therefore, this level of voluntary attrition (50 patients) could explain almost the entire decrease in hospitalization among the cost-sharing group (56 patients).

Individual-Deductible Arm

About 30 percent of those who dropped out in the cost-sharing arms were in the individual-deductible arm. Again, participants in this arm faced 95 percent coinsurance rate up to a \$150 maximum for the individual and \$450 per family for outpatient care but a coinsurance rate of 0 percent for inpatient care. Therefore, one question in this interpretation is why those in the individual-deductible arm would drop out if faced with a hospitalization that would be completely covered.

One explanation is that the illness episode may not be limited to hospital costs and might also include some outpatient expenditures, such as diagnostic tests, before the hospitalization or other outpatient services during recovery and convalescence. A participant could anticipate and avoid these outpatient costs by dropping out of the experiment before hav-

ing to incur them and reverting back to the more extensive coverage of his or her original insurance policy.

If the lack of inpatient cost sharing is an issue in explaining *attrition* in this group, it is also an issue in explaining why this arm of the experiment had fewer hospitalizations in the first place. The conventional interpretation is that these participants responded to the cost sharing, but if there was no cost sharing for inpatient care, then why would there be a drop in inpatient use? This drop in inpatient use was incorporated into and became part of the overall effect of cost sharing on expenditures, just like the reductions in hospitalizations in the other cost-sharing arms.

Indeed, the differential in cost sharing in the individual-deductible arm favored inpatient care over outpatient care and consequently might instead be expected to increase inpatient use to the extent that some care that would have been given on an outpatient basis could instead be given on an inpatient basis. These results are behind the RAND conclusion that “outpatient and inpatient services are, if anything, complements not substitutes” (Manning et al. 1987: 271), meaning that the individual deductible for outpatient care reduced both inpatient and outpatient care because these types of care tended to be consumed jointly during the same episode of illness.

An alternative interpretation, however, is that the care in question consists of both complements and substitutes, but some of those in the individual-deductible arm who faced care episodes requiring both inpatient and outpatient care (complementary care) dropped out in anticipation of cost-sharing expenditures for these complementary services. For others in this arm, substitution of inpatient for outpatient care occurred. The net effect of the smaller number of complementary care hospitalizations due to attrition and the larger number of substitute care hospitalizations due to the price reduction to zero for inpatient care was the RAND finding of a smaller decline in hospitalizations in the individual-deductible arm than in the other cost-sharing arms. Thus, the RAND conclusion that inpatient care is a complement and not a substitute for outpatient care is also potentially spurious because of the attrition in this arm.

Implications for Health Outcomes

The most important implication of these attrition data, however, is in the reinterpretation of the health outcomes results. RAND researchers found that, even though there was a reduction in hospitalizations among those assigned to the cost-sharing plans, the reduction in hospitalizations was

not concentrated in the least-effective procedures but instead occurred across the board: both effective and ineffective hospital procedures were reduced (Lohr et al. 1987). Moreover, the reduction in hospitalizations in the cost-sharing group was not concentrated in inappropriate admissions but comprised the same mix of appropriate and inappropriate admissions as was experienced by the free FFS participants (Siu et al. 1986). Thus, if participants in the cost-sharing plans became ill and received about 23 percent fewer inpatient treatments, it is likely that their lack of equally effective and appropriate treatments would have shown up as reductions in the more important health-status measures. That these measures did not register declines in health suggests that an alternative explanation is likely.

That alternative explanation is, of course, that many in the cost-sharing arms left the experiment voluntarily when they learned that they had become ill and needed a hospital procedure. Those participants in cost-sharing plans who remained in the experiment received the same type of care (in terms of effectiveness and appropriateness) when they became ill, as did those in the free FFS plan, so they registered the same level of health status on average. The rate at which hospitalizations occurred, however, was lower because some participants dropped out upon becoming ill and thus received care outside the experiment. As a result, substitution (of nonhealth goods and services for hospital care) simply did not occur in the cost-sharing group. Instead, it is likely that hospitalizations occurred at about the same rate in both groups, given the reduced number of ill participants in the cost-sharing group because of the attrition.⁸

Conclusions

Conventional theory suggests that all of the additional health care we consume when insured is inefficient, and the RAND HIE provided the

8. Yet another puzzle observed in the RAND data was that, if anything, those in the cost-sharing arms experienced fewer painful or worrisome symptoms than those in the free fee-for-service (FFS) arm (Newhouse and the Insurance Experiment Group 1993: 204–208). This was contrary to expectations, if being in the cost-sharing arm meant that consumers were more likely to forgo the treatment of symptoms because of the cost, resulting in illnesses that went unresolved and symptoms that persisted as worrisome or painful. The RAND researchers explained these results as a possible indication of the prevalence of more adverse effects resulting from the additional care received in the free FFS arm (*ibid.*: 208). Alternatively, if a number of those participants in the cost-sharing arms with painful or worrisome symptoms had already dropped out of the experiment (because they had experienced these symptoms, had been diagnosed, and were receiving care outside the experiment), then the periodic surveys would have registered fewer participants with painful or worrisome symptoms in the cost-sharing arms, as was observed in the RAND experiment.

empirical evidence to support this theory. While many empirical studies have shown that cost sharing reduces health care consumption, the RAND HIE remains virtually unique in that it also sought to determine the health effects of this reduction, as evidenced by a broad array of physiological and other health measures. In a recent review of the cumulative impact of the RAND HIE on American health policy, Gruber (2006: 4) singled out the “conclusion from the HIE . . . that while higher co-insurance rates led to lower levels of both effective and ineffective medical utilization, they did not have an adverse impact on health outcomes for the average person” as “perhaps the most striking” result of the experiment.

Arguments for Consumer-Driven Health Care

Although many years have passed since these studies were first published, they still resonate today. For example, the arguments currently used to promote consumer-driven health care are based on these studies. Consumer-driven health care pairs an HSA with a health insurance policy containing a large deductible. Under this arrangement, when a consumer becomes ill, health care is paid for first out of the HSA, then out of pocket (if the HSA is insufficient to cover all the health care expenditures up to the deductible), and finally by the insurer (for any expenditures beyond the deductible). As with the imposition of coinsurance payments, consumer-driven health care and HSAs are designed to reduce the moral-hazard welfare loss by raising the price that insured consumers face for care, compared to the price at which insurance simply pays for all care (Pauly and Goodman 1995: 129).

The arguments used by advocates of these policies derive from conventional moral-hazard theory. For example, a spokesperson for the George W. Bush administration presented the case for consumer-driven health care in this way:

What is driving this unsustainable run-up in health insurance costs, and how can we make things better? . . . Health care is expensive because the vast majority of Americans consume it as if it were free. Health insurance policies with low deductibles insulate people from the cost of the medical care they use—so much so that they often do not even ask for prices . . . To control health care costs, we must give consumers an incentive to spend money wisely. We can do this by encouraging the purchase of high-deductible policies. (Hubbard 2006)

The theory of the moral-hazard welfare loss is unmistakable in this rhetoric.

Likewise, the RAND HIE “was a phenomenally important study that has continued to influence the way we think about health care delivery thirty years later” (Gruber 2006: 9). Its empirical results are still used to reassure policy makers that policies designed to reduce health care consumption will not adversely affect health. For example, one consumer-driven health care advocate writes that

the best evidence available shows that, on average, those in ill health fare no worse with high-deductible insurance than they do with other types of coverage, including “free” health care. Over a 12-year period, the RAND Health Insurance Experiment studied 2,000 families that were randomly assigned to different types of health insurance. Some of those families were given “free” health care. Others were assigned coverage with cost sharing, including some plans that resembled HSAs.

Health outcomes for people with high deductibles were overall no worse than for those with any other type of coverage. That is despite the fact that those with high deductible insurance consumed far less medical care. (Cannon 2006: 4–5)

Thus, the RAND HIE’s findings imply that the care that would be eliminated when consumer-driven health care is imposed would be low-value care, the elimination of which would have little effect on consumers’ health.

Need for a Nuanced Approach to Cost Sharing

The new theory, however, suggests that a more nuanced approach is needed. It also suggests that, while some moral hazard decreases welfare and is inefficient, much of moral hazard—the serious, expensive medical care that ill consumers *could not* purchase because it is unaffordable—is efficient. Even the moral hazard that consumers *could* purchase but *would not* purchase without the extra income that is transferred through insurance (such as Elizabeth’s breast reconstruction) is efficient. These types of moral-hazard purchases should be encouraged. Only the inefficient moral hazard should be discouraged by cost-sharing provisions.

A nuanced approach, therefore, would target only the inefficient moral hazard, not all moral hazard, for cost sharing (Nyman 2003). For example, coinsurance rates and deductibles might apply to cosmetic surgeries or to lifestyle drugs, such as those for erectile dysfunction. No cost sharing, however, would be applied to the physician-recommended treatments for asthma or diabetes sufferers or for a physician-recommended course of

chemotherapy for cancer patients, even though these expenditures occur early in the coverage period when a deductible or a coinsurance payment would normally apply.

Also, a nuanced approach would recognize that some of the RAND findings are misleading. The RAND findings suggest that access to serious care, such as effective and appropriate hospital procedures, could be reduced through cost-sharing provisions without causing any substantial reductions in health, implying that all additional hospitalizations consumed when insured are not very valuable. However, these findings must be reinterpreted in light of the large number of participants in the cost-sharing plans who voluntarily dropped out of the experiment. The reduction in hospitalizations is instead likely to represent participants who, when faced with a diagnosis requiring inpatient care and the accompanying large RAND financial disincentive, chose simply to drop out of the experiment and receive this care under their original insurance policies, in which full coverage was likely to obtain. If the number of equally effective (Lohr et al. 1987) and appropriate (Siu et al. 1986) hospitalizations had actually been reduced by about a quarter, it would likely have had an important and measurable dilatory effect on the health statuses of the participants involved. Thus, the implication of the RAND study that reducing *any* type of moral hazard through cost sharing, even moral hazard in the form of effective and appropriate hospital procedures, would produce no measurable effect on health is probably spurious.

Alternatives to Cost Sharing

The new theory also suggests that the reduction of inefficient moral hazard through application of cost-sharing policies may not be the most effective way to reduce health care costs in the United States. The inefficient moral hazard may simply represent a transaction cost that we must pay in order to transfer a given amount of income from those who purchase insurance and remain healthy to those who become ill. Other types of health insurance, such as insurance that pays a certain lump sum dollar amount upon diagnosis of a certain disease, would not produce inefficient moral hazard, but they may require even greater transaction costs—for example, the cost of verifying diagnoses and monitoring for fraud and the cost of writing very complex legal contracts to cover all the possible sequelae and complications of a disease. The fact that most insurance in the United States directly pays for medical care may simply mean that this type of insurance has the lowest transaction costs for transferring a given

amount of income to the ill. To the extent that these costs are irreducible, they can be ignored in the welfare calculations.

Public policies, other than those that focus on reducing the quantity of care, may be more effective in reducing health care expenditures. For example, a better policy may be to reduce the prices of medical care (Nyman 2003; Anderson et al. 2003). Health providers sell goods and services that have a high intrinsic value—after all, what could be more valuable than our lives and health? It is easy, therefore, for those health care providers who discover that they possess some degree of market power to raise prices (at least temporarily) and thereby make large incomes and profits. In the past, private insurers simply paid these higher prices, but now the insurers have come to realize that they, too, possess bargaining power—the bloc of business represented by the thousands and sometimes millions of people who are their enrollees—and that they can use this power to negotiate lower prices from providers but still charge high premiums to their enrollees, thus capturing the profits that formerly went to the providers. High prices thus appear to be endemic to our health care system. Indeed, there is probably no sector of the economy (other than, perhaps, the defense sector) in which prices communicate as little about the true cost of producing a good or service as they do in the U.S. health care sector (Porter and Tiesberg 2004).

As a result, it is difficult to imagine a solution that does not involve government intervention. But government intervention does not assure low prices; it only makes them possible. For example, the Veterans Health Administration is known for using its buying power to negotiate low prices for the pharmaceuticals it buys, but Medicare, because of the recent coverage-expansion act, is at present explicitly prohibited from negotiating lower drug prices. In general, however, greater government involvement in the health care sector has been shown to be associated with lower health care costs (Pfaff 1990). The cost savings from the government negotiating health care prices can then be used to insure the uninsured and to pay for the resulting increase in health care consumption.

The conventional theory of the moral-hazard welfare loss and the conventional interpretation of the RAND HIE results have created a policy environment in which health insurance is viewed as more of a problem than a solution (Gladwell 2005). We must recognize, however, that much of moral hazard generates a welfare gain that society should encourage rather than discourage. Because of this reevaluation of moral hazard, we must also realize that health insurance is much more valuable than has been recognized. Indeed, there is probably no other investment that we

can make as a society that would generate as great a net return on welfare as finding a politically acceptable mechanism for insuring the large portion of U.S. citizens who are currently uninsured.

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