

# Simple Humans, Complex Insurance, Subtle Subsidies

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## I. Introduction

The behavioral revolution in economics tells us that human beings often have a difficult time making wise choices. The most widely chronicled difficulties occur in conjunction with decisions made under conditions of uncertainty, decisions that involve significant elements of time, and decisions in complex environments. Unfortunately, these are precisely the types of choices that are entailed when individuals must choose a health insurance policy, and when to devote time and money and possibly accept discomfort to consume health care.

Historically, U.S. consumers have been shielded from many choices about their health care. For workers under 65, employers have been responsible for designing health insurance plans and most have provided employees with a single plan or a simple menu of options. For the elderly and the poor, the government provided a single plan. And traditional plans often provided first dollar coverage without copays, so a consumer's choice about whether to consume health care simply required the consumer to weigh the time and discomfort costs of obtaining care with the potential benefits.

Recent developments have put more choices in the hands of health care consumers. These developments have been motivated by concerns about both rising costs and potential over consumption by individuals who can buy health care resources at a price far below their social costs. Copays and deductibles have become more widespread and force consumers to consider money along with time and discomfort in deciding whether to obtain care. Many employers and Medicare and Medicaid seek to foster competition and choice by offering participants a range of plans, including a

number that offer managed care. In short, for consumers, purchasing health care has become more like buying an automobile, with many choices and many financial factors to consider. Moreover, the trends in policy proposals from both the left and the right are toward options that would shift significant numbers of people away from employer-based coverage, where employers make many of the tough choices for them, and toward arrangements that would make individuals responsible for making additional, complex choices – both over which insurance plan to purchase and when and how much health care to consume.

In this paper we argue that policy analysis of the tradeoffs involved in giving consumers increased responsibility for making health care choices needs to supplement the traditional economic models of insurance with critical lessons from behavioral economics.<sup>1</sup> The typical analysis that viewed the design of an optimal health insurance program as setting the right tradeoff between risk spreading and appropriate incentives captures neither current realities in the health-care marketplace nor humans' abilities to make rational decisions. Indeed we argue that behavioral economics provides much more of a normative justification for many of the features of our existing health care policy than do many of the models of traditional economics. If our argument is accepted, a logical implication is that with their justifications not understood, many current policies are mis-designed.

We begin broadly by discussing why behavioral economics provides a useful frame for viewing consumer decision making about health care. We then argue that policy analysis of the wide range of subsidies that permeate the health care system changes substantially when viewed from the behavioral perspective. Finally, we discuss

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<sup>1</sup> Newhouse (2006) and Chernew, Rosen, and Fendrick (2007) make similar arguments about supplementing the standard model with lessons from behavioral economics.

how recent policy trends can be assessed from a behavioral perspective, and how that perspective alters the interpretation of the relevant tradeoffs.

## **II. The Challenge of Health Care Decision Making**

We focus primarily on two types of health care choices. The first is the decision of whether to purchase health insurance, and, if so, what type and which specific policy. The second is when and whether to obtain health care. Both types of decisions involve uncertainty, time, and complexity, thus bringing behavioral decision to the fore. Status quo bias is also an important feature of health care decision making.

### *Health Decisions under Uncertainty*

In the text book model, the prime insurance decision is usually how much to purchase of an actuarially unfavorable policy. The greater an individual's risk aversion, the more that is purchased. Individuals at high risk due to unobservable factors will find insurance actuarially favorable, and will purchase full coverage, illustrating adverse selection. In effect, the individual conducts a von Neumann-Morgenstern expected utility calculation, considering the payoffs with varying levels of insurance given the distribution of possible outcomes.

Health insurance, as commonly found in the United States, presents a more complex set of decisions, though in theory the same normative model would apply. The distribution of outcomes are the financial costs of paying for care for each possible illness the consumer could experience during the year without insurance and with each of the available insurance policies. Matters are simplified because individuals can choose only among a specified set of policies. But matters are much more complex than with say

homeowners' or life insurance because there are so many possible "loss events." Each individual will face differing risks of the various possible conditions, risk levels that are extremely hard to assess. Beyond this, initial choices to secure care enmesh the individual in a stream of options that lead to further care and further expense for both the consumer and the health plan. To illustrate, if the individual is screened for prostate cancer, that may ultimately save his life, but it also may lead to half a dozen treatment options, each with different consequences for both expenditures by the plan and the individual, and for his quality of life and survival. It is almost impossible for individuals to make sensible decisions when confronted with so many material secondary branches coming out of so many main branches along the decision tree.

The literature on behavioral economics tells us that individuals do a poor job of assessing probabilities. The classic article, Kahneman and Tversky's (1979) work on prospect theory, reveals that individuals homogenize probabilities on either side of 0.5. That is, they do not distinguish sufficiently between a 5 percent chance and 20 percent chance, or for that matter between 1 percent and 10 percent, and that there are jumps in responses at 1 and 0. Alpert and Raiffa's (1982) work on probability assessment makes it evident that individuals are much too confident of their estimates; when asked to give a series of 98 percent confidence intervals around a list of unknown quantities, the true value lay outside the interval provided by the subjects a whopping 43 percent of the time.

This is not good news for individuals making decisions about insurance for medical care. There are hundreds of possible events, many of which have exactly the sort of small probabilities where judgment is the worst. If people are too confident about what they know, they will be unlikely to contemplate extreme events, such as having a

car accident that will lead them to be in the hospital for a month or contracting a serious case of cancer.<sup>2</sup> Thus they will purchase too little insurance.

Even conscientious students of decision analysis would be challenged if attempting to purchase health insurance on a rational basis. It is next to impossible to gain information on the distribution of outcomes and the associated financial costs. Ask yourself, what is the probability that you will have a heart attack this year? Will get diagnosed with cancer? Will need back surgery? Is there any chance that an ordinary person knows such probabilities within a factor of five?

The challenge of assessing probabilities is compounded by the problem of predicting the financial costs should one of these conditions arise? Given that the medical system presents different prices to different consumers -- typically higher prices for those paying out of pocket -- is there even a place one could go to look up these prices? And informal surveys suggest that even individuals covered by insurance have little idea of how much it would cost them to be treated say for lung cancer or a heart attack

We have only talked about financial costs, but health care decisions involve far more. The “payoffs” in different states of the world are not just financial amounts, but also involve health-related utilities. Assessing utilities, say of coping with a medical condition because one failed to treat it earlier, presents its own challenge. How terrible would it be to live with diabetes when you were in your 60s? What is your willingness to pay to avoid needing cataract surgery, or to avoid one chance in 100 of dying early at age 60?

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<sup>2</sup> See also Kunreuther’s work showing that people do not buy insurance against floods, even when they are in a flood zone.

In this analysis, we shall assess health-related utilities in quality-adjusted life years, which go by the acronym QALYs. Evidence of the difficulty of answering the questions just asked is seen in the disparities in the QALY literature between assessments due to doctors and other medical professionals and assessments generated by asking people with those same conditions -- people living with the conditions generally find them less horrible than the medical professionals do.<sup>3</sup> A similar phenomenon appears to arise among patients judging before rather than after the fact. Evidence suggests that individuals living with an unpleasant condition, say incontinence after prostate surgery, generally rate it more favorably than those who are contemplating the possibility of the condition when they are deciding about treatment. More generally, individuals overestimate how good or bad outcomes will affect their happiness (Gilbert, 2006). Given that medical surprises are mostly on the down side, it is fortunate that there is a lot of inertia in our self perceptions of well being.

So if it is hard to imagine that the ordinary consumer knows her own probabilities, associated costs, and health utilities, how can she make informed decisions about what insurance to buy? One possibility is that consumers could merely ask their physicians. Health care is a quintessential example of a principal-agent relationship, where the physician is the supposedly well informed agent, acting faithfully on behalf of her principal. In practice, this seems an unpromising strategy. First, research indicates that physicians themselves exhibit the same sorts of cognitive biases than patients do. Even in the much more manageable atmosphere where a patient has a particular condition, doctors are often loath to assess probabilities, as anyone who has asked a doctor to do so knows well. Two common responses are: "it is impossible to put a

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<sup>3</sup> Murray (1996).

probability on it,” and “it all depends on the particular patient.” And doctors generally are not inclined to give advice on issues involving health insurance plan choice.

Another way to make informed decisions might be to observe the experiences of friends and coworkers who choose various insurance arrangements, including self insurance. But given the large number of very low probability health events that afflict an individual, this technique would yield a poor estimate of the distribution of personal outcomes under such arrangements. Presumably, humans have some common heuristics for extrapolating from common occurrences to tail events. But the experience with probability assessment (Alpert and Raiffa) and with probability scaling (Prospect Theory) suggests that these methods are far from reliable for individuals who must cope with low-probability, high-consequence risks. And this should not be all that surprising. After all, primitive man daily confronted high-probability, high-consequence risks; low-probability risks were a minor concern.

### *Decision Making Across Time*

Many health care choices incur immediate costs to produce future benefits. These decisions include: whether to contract for health insurance today that will generate financial protection later in the year and possibly guarantee access to coverage for future years; whether to have a painful and/or expensive medical procedure today that may yield health benefits in the future; and whether to invest dollars or effort in preventive care.<sup>4</sup>

A central finding of behavioral economics is that people tend to underinvest in these sorts of activities, placing excessive weight on current period costs and

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<sup>4</sup> A separate set of health decisions, mostly in the category of health behaviors, involve actions that have current benefits but generate health costs in the future. The health policy debates over how to reduce rates of smoking, obesity, and sexually transmitted diseases fit in this category. Gruber and Koszegi (2001) and Bernheim and Rangel (2004) develop behavioral models that apply to these circumstances.

underweighting next period benefits. Interestingly, though most individuals have a big discount factor between today and tomorrow, where tomorrow should be interpreted metaphorically, their tradeoff rates between tomorrow and the next day are often consistent with what economists would prescribe. This behavior pattern is called hyperbolic discounting (Laibson 1997). As should be obvious, such preferences lead to procrastination, putting something unpleasant off for another day. They also lead to dynamic inconsistency, since one's plans for tomorrow get postponed when it becomes today.

Liquidity constraints provide a more conventional explanation of why people under-consume goods incurring current costs but offering large future payoffs. This explanation is particularly relevant among younger households, households in the lower part of the income distribution, and those who have locked themselves into lumpy consumption commitments such as home mortgages for which there are high costs of revising consumption levels. But to explain phenomena, we should not just take refuge in the easiest rational explanation. Poorly chosen procrastination must compete along with liquidity constraints even for this group's under consumption of future-oriented goods.

There is also evidence from psychology of another behavioral factor that may cause people to under invest in future health: people do not like to contemplate bad outcomes, particularly death, and therefore make decisions that ignore or down-weight the possibility of these adverse outcomes (Kastenbaum, 2000). Kopczuk and Slemrod (2005) apply these insights to economic decisions such as failing to make intra vivos gifts or life insurance purchases, and we would add drawing wills. Insights about bad-outcome myopia apply with particular force to health care consumption decisions and may well be

the strongest explanation for why middle age men are notorious for not obtaining annual checkups. This mechanism may also be part for the story for why some patients fail to take the medicines they are prescribed for their chronic conditions, are remiss in doing the stretching exercises that would ameliorate future back pain, and avoid getting tested for HIV.

### *Decision Making in Complex Environments*

Choosing a health insurance plan is more of a challenge than deciding whether to purchase an apple or orange, or even a cell phone plan (a favorite subject for behavioral economists given its uncertain usage). Health plans themselves are complex, and hidden subsidies are pervasive within them, making it hard for a consumer to determine what prices she will face and what value of resources she will receive .

### Bundled Attributes

The standard health insurance package bundles dozens of attributes ranging from basic financial provisions such as deductibles, copayments, and coinsurance to separate pricing schedules for different medical conditions and different medical providers. Should I purchase the plan with lower premiums but a higher deductible? Should I purchase the plan that offers a private hospital room or the one with better mental health coverage? What about an add on for pharmaceutical coverage? We believe that, even ignoring the issues of time and uncertainty, consumers would have trouble making wise decisions when faced with complex consumption choices and pricing schedules. There is ample evidence from laboratory experiments in psychology (on pigeons, monkeys, and humans), and from real world contexts where decisions are far from optimal decisions

even when information costs are very low relative to the benefits received. These findings indicate that these difficulties are not simply a matter of people weighing the costs and benefits of optimizing and deciding that the losses from suboptimal behavior are less than the costs of optimizing. This is not mere satisficing. In many cases, it appears, poor choices when facing complex schedules reflect hardwired cognitive behavior patterns (see Liebman and Zeckhauser, 2005). Gabaix and Laibson (2005) show that in cases of complex products with multiple attributes, competition will not, in general, prevent the exploitation of unaware consumers by optimizing firms.

### Complex Subsidies

One of the features that makes it difficult for consumers to sort out decisions about health care is the complicated set of cross-subsidies that are present in the system. These subsidies make it hard to perceive anything approximating marginal prices, and also make it difficult to learn from friends, colleagues, and neighbors because they are likely to face a different set of subsidies and therefore prices than you do.

Both the government and employers use a wide range of instruments that affect the individuals' choices of health plans and health care, and which make it difficult to infer the price one faces as a consumer. Say you are young and working. Your employer pays most of the premium for your health care and the government ignores your employer-provided health insurance in calculating your taxable income. Do workers understand what the total premium cost paid on their behalf is and that at least economists believe that it comes out of their wage? One of us recently tried to use find out how much Harvard pays for our health care. In 30 minutes of searching on the

Harvard human resources web site, it was impossible to figure this out and the one resource that seemed closest to answering this question gave a misleading result.<sup>5</sup>

Do most workers, or even most employers understand the nature of the tax subsidies associated with health insurance? Moreover, what is the incidence model that applies here? In other words, what truly is the tradeoff one faces if one lobbies one's employer for more generous insurance? Do firms reduce all salaries by the dollar amount of health insurance premiums or do they apply a fixed percentage to the wage bill and effectively charge higher-paid employees more? Do older workers get lower salaries because they pay the same health insurance premiums as younger workers, though they get more benefit? And what happens in decentralized situations where fringe benefits are paid for at the center whereas hiring decisions are primarily the responsibility of the periphery.

Inferring the effective price of one's health insurance is further complicated because the pooling function of insurance causes people facing different risks to face the same insurance price. Within employee groups, the old are usually subsidized by the young, the high risk by the low risk, and at times, the low paid by the high paid. Who ultimately pays these subsidies is a matter of debate. A typical, but unanswered incidence question would be: If high paid workers are charged more for their health insurance than low paid workers, do their salaries adjust to reflect this? Do employers differentially lower the wages of women of child-bearing years because they are likely to

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<sup>5</sup> The web site contains an elaborate tax savings calculator that asks you to fill in most of the lines from your tax form and promises to tell you how much you save by receiving benefits pre-tax. Unfortunately, the calculator asks you to enter yourself the amount of pre-tax salary deductions you expect, meaning that most employees would enter the amount deducted on their paychecks and forget the tax savings on the Harvard-paid portion of the health premiums – which for most employees is by far the largest component of such savings.

have maternity expenses?<sup>6</sup> Of course similar cross subsidies occur in public insurance plans, such as Medicare and Medicaid, as well.

It is worth noting that whereas many of the behavioral phenomena we have identified suggest that people are likely to under consume insurance and health care, the hidden employer premium payments are likely to go in the opposite direction because workers may not realize that they are sacrificing cash compensation in exchange for employer premium payments. Instead, workers may perceive their own premium payments as their sole opportunity cost of acquiring more generous insurance coverage. In the old days, this did not matter, since health insurance costs were trivial relative to salaries. But it is not uncommon today to have workers who get more than a fifth or a tenth of their effective income from subsidized health care.

### *Status Quo Bias*

Markets for health plans, like any markets, work best when individuals effectively make choices amongst competing options. Unfortunately, even when faced with highly consequential choices and changed conditions, individuals have a tendency to stick with their prior choice. This tendency is called status quo bias (Samuleson and Zeckhauser, 1988). The original article on this subject provided evidence from the choices of Harvard employees in their allocations of retirement savings and choice of health plans. There is the possibility, of course, that individuals just stick with a health plan because it is optimal for them. To address this possibility, that analysis compared continuing employees and new employees of the same age. They found that new employees chose significantly differently plans from those of the same age who were continuing, implying

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<sup>6</sup> The evidence in Gruber (1994) suggests that the answer is, for the most part, yes.

status quo bias. (This was a time of particular turmoil in health plans, with plans both entering and leaving the system, and premiums for employees changing dramatically, which explains why new employees chose differently than continuing employees had originally.) Only 3 percent of employees changed plans in a year.

Given the way decisions are made, it is particularly striking that so much inertia is observed in the context of health insurance. The annual election period solicits an active decision from participants each year, and gives them only a short period in which to respond. To be sure, many companies automatically enroll the employee in the same health plan if the employee does not respond to the open enrollment form. However, even for them the fact that employees may need to adjust other benefits, particularly flexible spending accounts which must be specifically elected each year, should diminish effects due to default options.<sup>7</sup> Nonetheless, we see little shifting across plans.

In recent years, a literature has sprung up in behavioral economics on the importance of default options, and their possible use for getting individuals afflicted with behavioral tendencies to make “wiser” choices, i.e., choices that the experts recommend. Perhaps the best known illustration is the “save more tomorrow” scheme, where employees agree in advance to put a portion of their future salary increases into savings (Benartzi and Thaler, 2004). With initial experiments, the savings rate went from 3.5% to 13.6%. The key elements were making a decision today that affected tomorrow, and avoided hyperbolic discounting, and only allocating a portion of increases in earnings, avoiding loss aversion.

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<sup>7</sup> It is interesting that the new Massachusetts health plan does not force people to elect a plan during an narrow enrollment window. Instead, people can enroll at any time and the fine for noncompliance with the mandate is assessed continuously on a monthly basis rather than as an annual lump sum. We conjecture that a more discontinuous penalty schedule and shorter enrollment window might concentrate people’s attention more and do more to overcome inertia/status quo bias.

The implicit approach of this paper is similar, strictly pragmatic,. Our analysis proposes that the design of health plans, and the framework for choosing among them, should be based on an understanding of behavioral tendencies, with an effort to encourage individuals to ultimately take the choices they would if they could consult at length with expert advisors. In effect, we are subscribing to the agenda of libertarian paternalism (Sunstein and Thaler, 2003). “Equipped with an understanding of behavioral findings of bounded rationality and bounded self-control, libertarian paternalists should attempt to steer people's choices in welfare-promoting directions without eliminating freedom of choice.” That statement leaves open the question as to how welfare is to be measured. As we observe below, our criterion is the maximum number of quality-adjust life-years available for the dollars spent on health care. We recommend that the predictions of outcomes be done by experts, but that we distill as best we can QALY preference values from individuals.

### **III. Implications for Health Care Policy**

The bottom line is that we doubt whether many insureds, whether they hold individual insurance, employer-based insurance, Medicare or any other coverage, could accurately describe the combination of costs they pay for their health insurance and the nature of payoffs, both financial and health-related, they might receive. These complexities make it extremely difficult for individuals to purchase insurance sensibly, and particularly to choose among a wide range of policies that differ on many dimensions. Moreover, the same factors that hinder individuals in making wise choices as consumers also are likely to hinder people in making wise choices as voters – where

(except under the most self-interested model of voter behavior) voters need to understand elements of the health care system beyond their own circumstance.

But simply knowing that people may not optimize does not tell us the direction of the biases that result and the appropriate government response. In this section, we discuss how thinking about optimal health care subsidies is altered by the assumptions that people are not making wise choices. This analysis involves both efficiency and distributional considerations. In the next section of the paper, we apply these considerations specifically to the types of health care reform proposals currently being discussed at think tanks and by policy makers.

### *Basis for Judging Outcomes*

Judging welfare implications of policies can be challenging when individuals are behaving in non-standard ways. In particular, when people's preferences at different points in time are inconsistent, as in the case of hyperbolic discounting, or when people's choices suggest that they lack coherent preferences, such as when complexity causes them to completely give up on making a selection altogether, then the social planner typically needs to make a choice of which perspective is the valid one – a choice that cannot be validated using revealed preference (Bernheim and Rangel, 2005). On the other hand, when people are simply uninformed, the normative implications are generally straightforward – the social planner should choose for individuals the choice they would have made had they been fully informed.

A particular difficulty with medical procedures is that many people judge them to be much worse ex ante than ex post. If we allow the ex ante selves to make decisions, people will obtain too few procedures and avoid procedures they themselves will be

happy to have received ex post. Should we therefore allow individuals the wisdom of hindsight, and push decisions for others based upon what has been determined after the fact for other consumers in the past?

Our general view is that since individuals are such poor decision makers in many health contexts, it will often be necessary to use some more objective metric, such as QALYs gained per dollar spent, as the basis for social decision making.<sup>8</sup>

### *Behavioral Economics as a Normative Justification for Subsidizing Insurance Purchase*

Most arguments for subsidizing health insurance come from one of four notions: that it generates externalities (e.g., immunizations), that it is a merit good, that it is a right, or that it helps to facilitate the creation of large risk-sharing pools. The fourth argument is essentially risk spreading after some lotteries have already been run, since subsidies will induce individuals determined to be at lower risk to join alongside those at higher risk at the same premium. Subsidies for health care at point of delivery, e.g., low copays relative to marginal cost, are a prime risk-spreading tool, since those who are sick are likely to lose income and have other financial costs.

We believe that behavioral considerations provide an additional reason for subsidization of health insurance and of health care when received. Let us begin with the standard diagram that illustrates how the moral hazard from insurance is exacerbated by the tax subsidy to employer-provided insurance. The x-axis of Figure 1 measures the quantity of health care consumed. The curve labeled RR is the demand curve for health care that would result given insurance for a rational individual who understands probabilities, is an exponential discounter, and chooses in his own self interest. Thus, for

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<sup>8</sup> Chernew, Rosen, and Fendrick's (2007) Value-Based Insurance Design is motivated by similar considerations.

example, he understands that if he gets thrust deeper into the medical care system, his care will be heavily subsidized via insurance. The SS curve shows the social cost of providing medical care. Thus the socially efficient level of care is  $Q^e$ . In the absence of the tax-subsidy for health insurance, the consumer purchases a level of insurance that reduces his marginal cost per unit of health care to II, causing the consumer to overconsume at  $Q^i$ . With the tax subsidy, the consumer purchases extra insurance, reducing his marginal cost of consuming care to TT and further exacerbating overconsumption to  $Q^t$ .

Now introduce behavioral considerations. We start with the case where the consumer underconsumes care, and then turn to the case where the consumer underperceives the full cost of generous employer-provided insurance. Consider now a second demand curve, labeled DD. Curve DD is the demand curve of the simple everyman, who does a poor job of looking down the road, procrastinates, is at best inadequate in considering probabilities, etc. We have drawn the DD curve well below RR, after engaging in our speculation of how most individuals behave.<sup>9</sup> In particular, we have cleverly drawn the curve so that the consumer underconsumes if he buys unsubsidized insurance, but consumes exactly the social optimum  $Q^*$  with the insurance subsidy in place.

In this example, the lesson of the second best triumphs. Subsidizing the purchase of health insurance moves us toward the social optimum rather than exacerbating dead-weight loss. But is this empirically plausible? After all, the presence of generous insurance often reduces the consumer's price of obtaining care to something like 10

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<sup>9</sup> We have drawn the DD curve to intersect the X axis at a different point than the SS curve. This implicitly assumes that the individual is not even good at determining when care would be good for him if the monetary cost is 0. That is not unreasonable, since there is the hassle and anxiety cost of going to the doctor.

percent of the social cost. Could behavioral factors that encourage underconsumption be sufficiently large to offset such significant underpricing? The truth is that we have no idea. But it doesn't strike us as implausible.

There is disturbing evidence that relatively small changes in copayments can have quite large impacts on utilization (see for example Chandra, Gruber, and McKnight, 2007). This suggests that behavioral factors may be a big part of an under consumption story. Could people mistakenly judge a 1 in 100 risk of a medical condition as a 1 in 1000 risk? Could people myopically discount adverse health outcomes 30 years in the future at an 8 percent rate rather than at a 2 percent rate, assuming that a 2 percent rate is appropriate, thereby underweighting these payoffs by a factor of five? These orders of magnitude do not seem out of the question.

Of course, for behavioral factors to justify a health care subsidy, the factors leading to underconsumption need to be sufficiently strong not only to outweigh the moral hazard effects of insurance, but also to outweigh any behavioral factors that lead to overconsumption. As we explained above, in the current U.S. system, we think it is likely that the employer contribution to health insurance is underperceived, causing people to negotiate excessively generous insurance packages from their employers, and thereby giving up too much in salary. If this is true, then the TT curve would shift down even further. A similar phenomenon among the electorate might cause older Americans to receive overly generous Medicare benefits, when they might prefer greater Social Security benefits instead.

It is worth emphasizing that there are a range of possible remedies for bad decision making. Designing an optimal subsidy to offset the human failures is only one such possibility. Another approach is to try to make the true prices and payoffs more

transparent, so that even we simple humans can optimize correctly. In particular, providing information and providing it in a particularly salient way could be a much cheaper approach to achieving optimal consumption levels of health care since it would not require us to incur the deadweight loss of taxation to raise the revenue for the subsidies, and the deadweight of excess subsidies to people who do understand the system, say professional economists. We think the transparency approach could be particularly fruitful in assisting consumers in perceiving the full cost of their health insurance. Employers could be required to either report annually to consumers the full cost of insurance or, better yet, add the employer share of premiums into gross wages on the pay check (before subtracting it again as a pre-tax payroll deduction).<sup>10</sup> To qualify for tax deductibility, employers could also be required to provide a fixed dollar subsidy to their employee's health plans, rather than offering proportional subsidies of say 70% of any health plan's cost. And of course the tax subsidy for health insurance could be capped to avoid goldplating.<sup>11</sup>

### *Behavioral Economics as a Normative Justification for Subsidizing Small Costs*

It is important to note a distinctive aspect of health insurance that is quite different from what would be proposed for ordinary insurance. Small costs are heavily subsidized, not merely large costs. For example, insurance typically pays most of the cost for routine office visits.

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<sup>10</sup> Note that if the size of the underconsumption from behavioral factors exceeds the overconsumption from insurance but not the further overconsumption caused by the tax subsidy, it could be optimal to eliminate the tax subsidy but permit the misperception of the employer cost to persist.

<sup>11</sup> A particular challenge for firms is risk adjustment. Ideally, differences in prices across health insurance plans would not account for the differences in risk levels of employees enrolling in different plan options. Though this concept is well understood in theory, it is rarely implemented. It seems to be just too hard for employers to get the prices right.

In part, this structure can be seen as a response to loss aversion, where small costs count heavily relative to large ones. Thus, individuals tend to like insurance that protects against relatively high-frequency, low-cost events. These are precisely the costs that individuals incur most frequently with their health care. Subsidizing such costs is a further way, apart from subsidizing insurance itself, to make health-care insurance attractive to the typical prospect-theoretic individual. It thus helps to build up the size of the insurance pool.

But subsidizing small costs also has a more fundamental role in our conception of health care decision making. These subsidies help overcome the underconsumption of health care by people who make bad decisions forgoing small costs today that will in expectation produce greater benefits down the road. Once one accepts this justification for subsidizing small health care costs, it is clear that the subsidies need to be carefully designed. A single price signal will not be enough to induce simple human consumers to acquire the optimal amount of care. Lest we be misunderstood, we are not concluding that insuring for small costs is desirable in health insurance. We are just pointing out that there are arguments in its favor. Structuring desirable subsidies should be a heavily empirical exercise.

Consumers who are more likely to underconsume care will need greater subsidies and subsidies will need to be greater for high value consumption and for types of consumption where consumers are more likely to fail in their decision making. Given that copayments are likely to be more of a discouragement to health care use of low-income consumers than of higher-income consumers, it is puzzling that we do not see much variation of copayments with income. Since someone earning \$25,000 might be more discouraged by a \$10 copay than someone earning \$40,000 would be by a \$25 copay,

implying that the poorer person would get more benefit from the discouraged visit. It seems clear that there should be progressivity in copayments, not merely in premiums. Note, we are not arguing for more progressivity over all, just consistent progressivity across the plan.<sup>12</sup>

It is also clear that there should be different copayments for different types of visits and different subsidies for different types of care. We are not proposing a much more rigid system, one which removes the primary choice of whether to consume health care from the hand (and mind) of the individual. We consider any such system to be politically infeasible, as well as inadvisable. But we should adjust the subsidies within the system to promote choices that yield more QALYs for the dollars we are using. Fendrick et al (2001) and Chernow, Rosen, and Fendrick (2007) make a similar recommendation in advocating Value-Based Insurance Design.

Recent evidence suggests that this sort of differential pricing is successful. Chernew et al (2008) study a firm that decreased copayments for five chronic medication classes, and found that adherence to the disease management protocol improved. Chandra, Gruber, and McKnight (2007) find that increased cost-sharing for retirees in California led to decreased usage of doctor's visits and prescription drugs and led to additional hospitalizations, implying that reversing this cost-sharing, or at least some of it, could have important health benefits, and perhaps yield financial savings to the system. Rowe et al (2008) point out that even when preventive services and medicines treating chronic conditions are exempt from copays, consumers may have to pay for physician visits in order to access the free services or prescriptions. They find however, that patients are not less likely to take advantage of free preventive services in these contexts.

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<sup>12</sup> The new Massachusetts Commonwealth Care plan is an example of a plan that gets this right. Copayments for primary care office visits are free for families with income below the poverty line, \$5 for families between one and two times poverty, and \$10 for families between two and three times poverty.

We should not, however, exaggerate the extent to which differential pricing is likely to yield benefits. Those advancing this approach frequently trot out their favorite preventive interventions as candidates for subsidy, and the best surely do extremely well. But this is argument by anecdote, and takes advantage of the Availability Heuristic (Tversky and Kahneman, 1973) from behavioral decision theory: People judge the relative frequency of an event by how easily an example can be brought to mind. Thus, if we can readily think of some preventive measures that would gain QALYs and save dollars, or even gain QALYs at a low price, we assume that such measures are widespread.

To be sure, some important preventive measures do fall in the cheap QALY category. Those that are most prominently mentioned are related to tobacco smoking, misuse of alcohol, physical inactivity, and poor diet, or more precisely to reversing those activities. It has been estimated that curing these problems could save 900,000 deaths annually, nearly 40 percent of total yearly mortality in the United States.<sup>13</sup> The U.S. Preventive Services Task Force identified attractive measures such as counseling adults to quit smoking, screening for colorectal cancer, and providing influenza vaccinations.<sup>14</sup> The first thing to note about these interventions is that many of them relate to actions individuals have to take for themselves, such as quitting smoking and exercising. These are activities that are beyond the scope of normal medical care, and might be dealt with better than with the annual visit to the physician, where one gets a pep talk, say in a workplace program. The other interventions are highly specific within the health care system.

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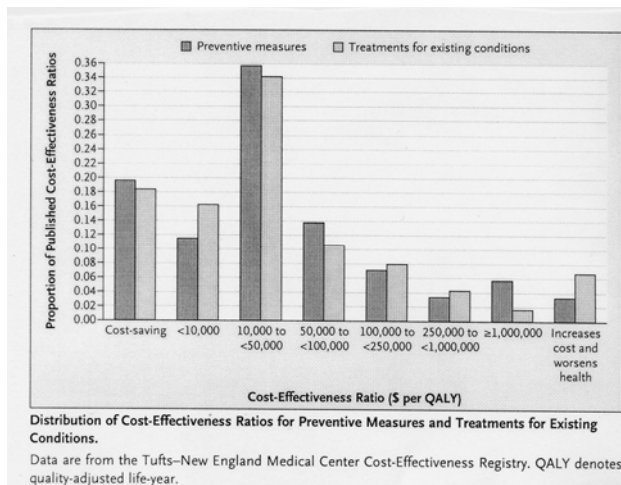
<sup>13</sup> Mokdad et al , JAMA 2004, as quoted in Cohen, Neumann, and Weinstein (2008).

<sup>14</sup> Cohen, Neumann, and Weinstein (2008).

Let us assume that we want to encourage individuals to get colorectal screenings and influenza vaccinations. These services should certainly be highly subsidized. But maybe we should go further, and actually pay people to get them. Should payment be contemplated for all cheap-QALY treatments? The answer is no. While there will be some services for which people should receive payment, there are other cases in which it would be a mistake. For payments to be potentially optimal, two conditions must hold. First, there must be some behavioral response to price. If the price elasticity is zero, then we are just randomly shuttling around money, which is disadvantageous. Second, there must be nonfinancial reasons (including any number of the behavioral concerns we raised above) for why people do not get the treatment? If there were no such nonfinancial reasons, we could simply offer the treatment for free and tell people to get it. Colorectal screenings, where the whole process is unpleasant, and vaccinations, which at least require a jab, both meet the test for being services where it potentially makes sense to pay people to obtain the treatment. (The unpleasant nonfinancial aspect also minimizes the chance that individuals will just collect multiple treatments to pick up the cash.) Moreover, such payments, if implemented, might provide a convincing signals to individuals that experts really thought the treatment yielded substantial expected health benefits.

A critical question is how widespread are such preventive interventions, and how do they compare to traditional medical treatments. Fortunately, a recent study by Cohen, Neumann, and Weinstein (2008) presents the evidence. It examined 1500 cost/effectiveness ratios published in the literature from 2000 through 2005, in articles where future benefits and costs were properly discounted. 279 of these ratios applied to preventive measures, and 1221 to treatments. Surprisingly, the distribution of the ratios

for prevention and treatments were much the same, as the figure below (reproduced with permission) shows.



Reprinted from Joshua Cohen, Peter Neumann, and Milton Weinstein, “Does Preventive Care Save Money? Health Economics and the Presidential Candidates,” *New England Journal of Medicine*, February 14, 2008, 358:661-663.

Thus, we conclude that prevention and treatment compete on relatively equal ground, given current practices. There are highly promising elements about the histogram. For both prevention and treatment, nearly 20 percent of procedures saved QALYs and costs simultaneously, and an additional 11 percent (prevention) and 16 percent (treatment) did so for less than \$10,000/QALY. Vaccinations, colonoscopies for older men, screening for some conditions in newborns where treatment can prevent debilitation, and high-intensity smoking cessation programs fall into these categories. But the histogram has extremely disturbing elements as well. At the unfavorable end, 9 percent of procedures either cost more than \$1 million/QALY or actually increase cost and worsen health. The implication of such findings is that there are significant gains to be made by promoting our cheap QALY procedures, and curtailing those that are exceedingly expensive per QALY, or that actually hurt health and increase cost. A prime

example of the last is surgery in 70-year-old men with new diagnoses of prostate cancer, as opposed to the procedure “watchful waiting.”

If we want to get more of the cheap-QALY procedures, and if we want to continue to rely on individuals to be the deciding voice in determining whether they get health care, the most immediate and promising instrument would seem to be the subsidy system, not the one that’s administered by the IRS, but that is part of every health plan. Thus, for example, prostate surgery for elderly men might lose its major subsidy. By contrast, individuals might be paid to enroll in smoking cessation programs.

If health plans, or indeed employers or the government, are to employ subsidies to affect health-related behaviors and medical treatments chosen, they will have to attend carefully to behavioral propensities. This will require considerable amounts of experimentation, to determine, for example, how much convenience, counseling from a physician, and dollar incentives matter when people are choosing their health-related activities.

### *Scheduling*

Let us test the reader for a moment. Assume that you have individuals making health-care decisions across the year. To simplify, let us say that they are all about visiting the doctor. The beginning-level economist would tell us to set a copayment amount that balances risk spreading and moral hazard, and would propose an amount. The second-tier economist would note that this tradeoff varies across numbers of visits. Risk consequences build up as the number of visits goes up, since individuals are risk averse. On the other hand, there may be a shift in the severity of visits as numbers go up. This second-tier economist might even note that the mix of patients getting 6 visits per

year is very different than the mix of people going on average once or twice, some form of adverse selection. She would propose setting a different copay for each visit, as the number rises, always trading off risk spreading and incentives. I presume most of you would go with the second-tier economist.

However, our earlier work on scheduling shows that you too have been scheduled. Let us assume that the copays went \$50, \$40, \$30, \$20, \$10, \$10, \$10... Then the incremental cost of the first visit, given that you would be making 6 or 7 visits, would be only \$10. Thus, 7 visits would cost you \$10 more in total (\$170) than 6 visits (\$160). Yet 90% of people, and perhaps 88% of economists would not see this if they were making such a decision in everyday life. The implication of this disturbing mind puzzler is that we must design systems for mere mortals, not the people who inhabit the models of traditional economists.

Now let us go back to our doctors' visits. We first propose a straw man. Posit that the social cost of an office visit is \$125. Should we not charge this amount, apart from the annual checkup, at least for a couple of visits a year as a way of deterring overutilization? Most readers were probably horrified at the thought of a \$125 copayment. In part, we would argue, that is because they are anchored on their own copayment, or the \$15 one we mentioned. Such anchoring is a prime subject in behavioral decision. But they would also think that the type of look ahead strategies we outlined as rational would be well outside the normal thought process of most patients. They might speculate that patients would attend to the here and now, the payment outlay, the time and possible anxiety involved in going to the doctor, and would count it heavily relative to future benefits. In effect, they would be arguing that people count the present many times more heavily than the future, where the future may be only a month away.

They would be arguing for hyperbolic discounting as a powerful description of real world behavior. Thus, unpleasant and expensive activities tend to be postponed, even when they prevent much more expense and unpleasantness later.

### *Optimal Provision of Anxiety Reducing Care*

Traditional decision theory does not incorporate anxiety. All outcomes are assigned utilities at the end of the tree. There is no joy of anticipation of anxiety or dread along the way. But anxiety, and its relief, is a major component of many individuals' encounters with the health care system. We would argue therefore that it should be treated as a valued component of utility, and should go into life-year calculations.

Consider diagnostic testing for example. Some would say that it should only be employed when it will affect medical treatment. But that approach ignores anxiety. Consider an individual who has been suffering from persistent headaches recently. There are dozens of possible explanations, but one that is likely to leap to mind is a brain tumor. On a pure odds basis, this is quite unlikely, but it may be reasonable for a doctor to offer reassurance by providing a brain scan, just to rule out the possibility. For some individuals, living with fear of a brain tumor may be as discomfiting as living in constant pain. A procedure costing a mere few thousand dollars may relieve that concern with high probability.

Anxiety, we speculate is highly nonlinear with the probability of an underlying medical condition. Thus, a 1percent risk may cause nearly as much distress as a 10 percent risk. Straightforward decision analysis will not get us to the right conclusion about medical care if we wish to take anxiety seriously.

Relief from anxiety does not always argue for more or more intensive care. It is now recognized that many women have had breast cancers that did not show up on ordinary mammograms. One possible recommendation then is to proceed to MRI examinations, which are both more sensitive and more expensive, for these women. A prime argument against this approach is that MRIs produce many false positives, dangerous looking situations that need to be biopsied. Given the availability of needle biopsies, the costs of such procedures – both financial and discomfort – are not exceedingly high. However, some doctors are hesitant to recommend turning to MRIs because they will significantly raise the woman’s anxiety level when biopsies are required. We would argue to the contrary, that since the time from the MRI to the ultimate test results need not be long, the anxiety period is brief. This is precisely the opposite of the brain tumor scan, where anxiety is relieved for a very long period of time.

Whatever the implication in any particular context, our argument here is that anxiety from health care procedures, or their lack, should be taken into account when structuring subsidy systems in health-care plans.

*Distributional Consequences of Heterogeneity in Behavioral Propensities and Preferences*

Some individuals are heavily prey to behavioral tendencies. Others can mostly escape them. Unfortunately, the health care system can not readily distinguish between these two groups of people. Thus, if the lessons of this paper are taken seriously, it will be important to determine the general distribution of different tendencies in the relevant populations. (Old people, who make up Medicare beneficiaries, may behave differently than the typical worker with employer-based insurance.) A system has to be designed to

optimize given the distribution of decision propensities in the population. This implies, of course, that the system will be poorly designed for some beneficiaries. Thus, those who have neither loss aversion nor are hyperbolic, they will capitalize on care much more than we wish. That is not hypochondria; it is just self-interested decision making.

In the context of heterogeneity, we should also notice that individuals have different underlying preferences. The health care system should respond to those preferences as well as it can. Yet frequently physicians have a one-size-fits-all approach to making therapeutic recommendations. If you are a 60-year-old with prostate cancer, and your first visit is to a urologist, you will likely get a prostatectomy. A radiologist would steer you, by contrast, toward radiologic treatment. This need not be the case. Sommers et al (2007) develop a framework for incorporating eliciting patients' preferences and incorporating them into the treatment of prostate cancer. If we wish to maximize QALYs for the dollars we spend, the system must recognize not only individuals' common behavioral proclivities, but also their distinctive preferences. As behavioral economists, we are willing to dispute decisions, but not individuals' underlying preferences.

#### **IV. Implications for Current Policy Debates**

Historically, federal tax subsidies for health insurance have been dominated by the non-taxation of employer provided health care, a tax expenditure projected to reduce revenue by \$168 billion in 2009. This subsidy encourages the formation of workplace-based purchasing pools, reducing the adverse selection and high administrative costs problems of the individual market. It also encourages more people to buy health insurance and the ones that do buy it to buy more of it, e.g., to purchase a more

comprehensive health plan. In short, it exacerbates the moral hazard problems stemming from insurance. And the location of these purchasing pools at the workplace has the potential to distort labor markets in several different ways, such as tying workers to jobs. Moreover, the particular design of the existing subsidy system tends to have adverse distributional consequences, though this could be corrected without abandoning employment-based health insurance, say by capping the subsidy. Standard policy analysis of this tax subsidy weighs the protection benefits it affords of increased insurance vs. the various distortionary costs.

The trend in policy proposals from both the left and the right is to propose options that would shift people away from employer-based coverage. The most ambitious plans on the left propose to replace private employer-based insurance with publicly –provided insurance, via Medicare for all. Other plans retain private insurance, but abolish employer-based insurance in favor of new geographically based purchasing pools (Diamond, 1992; Wyden 2006). More centrist plans, like the recently enacted Massachusetts plan, aim to maintain employer-provided coverage, but introduce generous subsidies for those purchasing insurance through newly created purchasing pools. These pools will likely produce a modest shift away from employer-based coverage to the individual market. From the right, the most common plans attempt to “level the playing field” by providing equivalent subsidies to people purchasing insurance outside the workplace or by eliminating the employer-based subsidy altogether and providing tax credits to all who purchase insurance.

Other than the Medicare for All plans, each of these approaches would make individuals responsible for making additional, complex choices – both over which insurance plan to purchase and when and how much health care to consume. Given that

we believe it is unlikely that most individuals will make sensible decisions when confronted with these kinds of choices, this policy trend is troubling. We suggest four main lessons for health care reform from our analysis.

### *Consumers Need to Have Their Health Insurance Purchases Mediated*

Health insurance is too complicated a product for most consumers to purchase intelligently. The employer-based system works well because employers have strong incentives to act as faithful agents for their employees in selecting a very limited number of health insurance options. Effective selection is a public good: once conducted for one it is available for all. Moreover, employers can bargain in monopsonistic fashion against insurers; individuals can not. In theory, some entity other than employers could act as the mediator. For example, Massachusetts has created the Commonwealth Connector to offer a menu of standardized plans to individual market purchasers.

While the Massachusetts experience bears watching, we are dubious that public sector mediators will perform as well as employers currently do. First, public sector based mediators will be under pressure to offer every qualified plan. Thus, they will likely offer much a more extensive menus of options than most employers do. By not weeding out the less desirable plans, this will lead to many consumers making poor purchases. The Commonwealth Choice Plan of Massachusetts offers 20 plans, each with its own distinctive arrangements. To choose among them is surely a challenge for most individuals. Second, public sector mediators will likely assemble plans for broader population groups and respond to consumer tastes only indirectly via the political system. Employers are likely better able to tailor plans to the needs of their workforce and to revise plans if their workers are unsatisfied with them. Third, employers, particularly

large employers, may be more effective in persuading providers to implement innovative cost-saving and quality-improving measures than is the public sector.

It is also possible to imagine that mediators could emerge from the private sector. If consumers value these sorts of services, they could hire “health insurance agents” to help them buy insurance packages. This possibility strikes us as a recipe for very high administrative costs at best, and for disaster at worst. With complex products, competition often fails to drive out high-cost or low-quality providers. Consumers persist in buying mutual funds with annual fees of 1.25 basis points. Large price spreads continue to exist for identical Medigap policies.<sup>15</sup> Many consumers fail to choose the appropriate Medicare Part D prescription plan (Kling et al, 2007). And evidence ranging from the subprime mortgage market to the UK pension mis-selling scandal shows the problems that can arise when consumers are left to rely on private sector mediators to help them buy complex products. The basic problem is that such mediators would represent them for only one decision. Hence conflicts of interest on this purchase, e.g., steering them to favored firms, shortchanging them on time, must be expected. One’s employer, by contrast, is engaged with you on a continuing basis, and also has a financial interest in your good health.

The current employer-based system appears to us to offer a unusual combination of aligned incentives, innovative capacity, and easy capitalization on the public goods aspects of insurance purchases. These advantages may well be enough to outweigh any labor market distortions that occur from commingling health insurance and employment. Indeed, the most serious of the latter are being dealt with through portability legislation.

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<sup>15</sup> [http://findarticles.com/p/articles/mi\\_m0EIN/is\\_2004\\_August\\_16/ai\\_n6162126](http://findarticles.com/p/articles/mi_m0EIN/is_2004_August_16/ai_n6162126)

### *Copayments and Subsidies Should be Designed Via Cost-Effectiveness Analysis*

Many reform proposals appear guided by the goal of having consumers come as close as possible to facing the social price of producing care. The author of a prominent textbook concludes that the “optimal health insurance policy is one in which individuals bear a large share of medical costs within some affordable range, and are only fully insured when coverage becomes unaffordable.”<sup>16</sup>

Our analysis above suggests that this is the wrong benchmark. Most humans do not act as fully-informed, rational individuals who understand probabilities, are exponential discounters, and choose in their own self interest. This means that insurance subsidies and copayment rates should be set to maximize a cost-effectiveness measure of health outcomes relative to dollars spent, rather than set to the social cost of producing care. These subsidies and rates will need to reflect the true behavior patterns of consumers rather than the theoretical patterns of economic text books.

The second element of this lesson is that not all therapies, office visits, and interventions should be treated equally. The underlying goal should be to promote QALYs, and some treatments are much better at doing that than others. Subsidies should be targeted at highly cost-effective treatments. Some high-cost, low-value treatments should get no subsidy whatsoever.

### *Efforts to Cover the Uninsured Should Reflect Behavioral Obstacles to Coverage*

The standard model of the uninsured envisions those individuals as crafty calculators who have figured out that insurance is costly to them because they are in a risk pool that charges more than their expected cost and because the benefits of insurance

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<sup>16</sup> Gruber (2005), p. 409.

are truncated by the option of falling back on uncompensated care if they experience a medical emergency. This model inspires plans to assess financial penalties on those who remain uninsured as a way to change this calculus.

Our analysis of behavioral propensities suggests that uninsurance may be more a feature of inertia, complexity and status quo bias than one of financial calculation. If we are right, efforts to expand insurance coverage should focus more on finding ways to automatically enroll people into a default health insurance plan than on punitive financial incentives. The default plan should allow an opt-out option, for example so as not to punish those who are liquidity constrained because they locked themselves into lumpy consumption commitments, such as home mortgages. Otherwise, in a coerced version of The Gift of the Magi, we could have people selling their homes to pay for their insurance. In our conception, the threat of financial penalties for those who fail to purchase health insurance may be a useful tool, not because it tilts their financial calculus, but rather because loss adverse consumers hate penalties to an irrational degree. Thus, the threat of penalties may be what enables them to overcome inertia.

#### *Information Gathering on Effects of Behavioral Interventions Should be Increased*

One implication of individuals not being able to make good decisions on their own is that someone else must help make those decisions that are both complex and important. This places an extraordinary information burden on the mediators who are going to set up the default insurance plans and determine the subsidy and copay levels to maximize the welfare of the citizens.

How should mediators, whether employers or the government, know what types and levels of subsidy produce what types of behavior? Fortunately, there is a field of

behavioral decision that reveals a broad range of biases, such as Prospect Theory, hyperbolic discounting, and heuristic reasoning. The field draws on thousands of experiments, and many dozens of field studies. It has now moved to the domain of actually monitoring peoples' brains with MRIs to assess more precisely how information is processed.

However, such understanding merely points us in profitable directions. It does not tell us the relevant real-world elasticities, or how people will respond to monetary incentives when factors such as pain, avoided morbidity, inconvenience and anxiety are all additional considerations alongside money. Thus, we need to make major new investments in statistical studies, including randomized experiments, focused on measuring how individuals respond to the wide range of tools we have for modifying their health insurance and health consumption choices. Given that we can not rely on individuals to more than crudely approximate the maximization of their own health outcomes, these studies must focus on measuring health outcomes directly.

The ability to learn from experience is one unambiguous advantage of employer-based health insurance. Employers design offerings that differ, and in theory we can look at the data and see how individuals respond. Justice Louis Brandeis once remarked on a crucial advantage of the federal system: "a single courageous State may, if its citizens choose, serve as a laboratory" for innovative programs. When employers are the laboratories, this power of experiment is greatly magnified. We can learn about the potential for more tiers on a pharmaceutical subsidy program, how risk adjustment works in practice, or what differences emerge when employers hand out fixed versus proportional subsidies for the premiums of alternate insurers. Many of the questions that will be answered will be basically behavioral questions. And those behavioral questions

are fundamental to the ways that health insurance and health care should be delivered to Americans.

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Figure 1  
Optimal Subsidies

