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Comments and Discussion (on John E. Calfee and
Clifford Winston, "The Consumer Welfare
Effects of Liability for Pain and Suffering:
An Exploratory Analysis," by W. Kip Viscusi,
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Comments and Discussion

Comment by W. Kip Viscusi: The Calfee and Winston paper focuses on the role of pain and suffering compensation in tort liability contexts. In a novel approach the authors utilize survey information to ascertain the value that individuals would place on insurance for pain and suffering losses.

Compensation for pain and suffering and related nonpecuniary losses is actually much broader than their paper indicates. In most contexts pain and suffering is the shorthand used to summarize all components of nonpecuniary compensation received by accident victims. The pain and suffering associated with an accident and its subsequent effects on the injured person's health clearly enter into the calculation of pain and suffering damages, but they represent only one nonpecuniary loss component. In the case of a fatality, there is compensation for loss of consortium and companionship. Mental anguish is also a prominent concern in many jurisdictions. Family members may be compensated for grief, and there also may be compensation in some states for loss of the enjoyment of life. For simplicity I will use the pain and suffering designation to include all nonpecuniary losses.

It is helpful to begin by considering the levels of pain and suffering compensation actually paid in tort liability contexts. In particular, do injured parties, on average, receive more than the value of their economic loss, which would indicate the presence of some compensation for pain and suffering and other nonpecuniary losses? The mean total value of payments for product liability cases settled out of court is greater than the value of losses if the size of the loss is below \$100,000, and the rate of replacement of the loss is less than 1.0 for loss amounts

Table 1. Pain and Suffering Awards in 1977 Claims Sample from Insurance Services Office

Type of injury	Fraction of payment for pain, suffering
Amputation	0.51
Asphyxiation	0.47
Brain damage	0.38
Bruise	0.49
Burn	0.57
Cancer	0.54
Concussion	0.50
Dermatitis	0.41
Dislocation	0.42
Disease-other	0.48
Electrical shock	0.41
Fracture	0.30
Laceration	0.51
Para/quadruplegia	0.26
Poisoning	0.46
Respiratory	0.41
Sprain/strain	0.50
Other	0.35

Source: Viscusi (1991, p. 103).

greater than \$100,000.¹ Similar patterns are borne out for cases that go to trial as well as for other types of personal injuries. In particular, there tends to be an overcompensation of small loss claims and undercompensation of larger loss claims.

The fraction of compensation for pain and suffering damages varies by injury type. Table 1 reports the fraction of compensation devoted to pain and suffering for a series of categories of injury in product liability cases. The fraction of compensation for pain and suffering ranges from 0.26 for para/quadruplegia to 0.57 for burn victims. Overall, the performance of pain and suffering compensation varies quite systematically with the character of the injury. In particular, there is a strong positive income elasticity of the value of pain and suffering amounts with the dollar value of the economic loss. The amount of pain and suffering compensation, however, is not simply a proportional

1. See Viscusi (1991).

markup of the economic loss. Controlling for the economic loss, pain and suffering compensation varies with the type of injury in a reasonable manner. For example, severe injuries, such as those associated with burns, tend to be more highly compensated than are temporary injuries, such as poisonings.

From an economic standpoint, there are two rationales for pain and suffering compensation. First, pain and suffering compensation can help create efficient financial incentives for accident avoidance. Elsewhere, I advocate the use of pain and suffering compensation in situations where providing safety incentives is important.² In the case of fatalities, this would lead to use of the value of life numbers currently used to assess the stringency of government risk regulations. Since the deterrence aspects of pain and suffering are not the focus of the Calfee and Winston paper, I will not dwell on them here. Nevertheless, when making any policy judgments about the desirability of pain and suffering compensation, one must be cognizant of the deterrence of pain and suffering awards and not simply the insurance function that is the focus of their paper.

The second economic role of pain and suffering compensation is to provide insurance for losses that have been experienced. The optimal insurance amount for pain and suffering is the focus of the Calfee and Winston analysis. If individuals could purchase insurance for pain and suffering, which they cannot now do, would they choose to provide such compensation for themselves after having experienced an injury? Market evidence regarding the failure of insurance firms to offer pain and suffering insurance may not be conclusive since the presence of pain and suffering and its severity may be difficult for the insurer to monitor, thus creating problems of moral hazard. Using surveys such as that developed by Calfee and Winston, one could ascertain whether there is an underlying economic rationale for insuring against pain and suffering losses.

Although deterrence and insurance are clearly the most salient concerns of economists, pain and suffering compensation in practice entails much more. Plaintiffs must utilize some of their award to pay for their legal fees. The usual contingency fee arrangements require payment of one-third of the award to the plaintiff's attorney. Compensation for pain

2. Viscusi (1991, especially chap. 5).

and suffering damages gives plaintiffs additional financial leeway to enable them to pay their attorneys and at the same time meet their economic needs. Juries may provide pain and suffering compensation in part as a mechanism for transferring funds to plaintiffs for this purpose. If we were to limit pain and suffering compensation in some manner, then other components of the award might adjust so that juries could continue to provide for plaintiffs' legal expenses. If awards were not increased and if there were no pain and suffering compensation, individuals would not be fully compensated for their economic losses because such compensation would not take into account the deduction that must be made for legal expenses.³

One impetus for scheduling or capping pain and suffering compensation is that as a practical matter juries may not have precise guidance for setting the level of pain and suffering compensation. Although some have suggested that juries are completely random and capricious in their awards of pain and suffering, these criticisms are not consistent with the empirical evidence on pain and suffering compensation, which varies quite systematically with injury type.⁴ Nevertheless, there is no well-defined formula that juries can implement to establish pain and suffering levels. Research such as that by Calfee and Winston can further our understanding of the optimal levels of pain and suffering compensation insurance and can assist in informing jurors of how such compensation levels should be set. There should be substantial changes, however, in the structure of their survey, which I will delineate below.

Theoretical Background

The theoretical issues in the context of pain and suffering compensation are well defined. In situations in which losses to the accident victim are purely financial, the individual's utility function is not affected by the accident. Full insurance of losses will be optimal.

In contrast, if the utility function alters with an injury, the optimal

3. One recent proposal was to establish a separate component of compensation for legal fees. In particular, the American Law Institute (1991) has considered proposals that would establish a schedule for pain and suffering compensation and provide separate compensation to plaintiffs for their legal expenses.

4. See Viscusi (1991, chap. 5) for supporting discussion.

level of insurance will not provide for full loss replacement. If the marginal utility of income increases with an injury, more than full compensation will be optimal. If the marginal utility of income decreases with an injury, then less than full compensation will be optimal.

These judgments pertain only to situations in which the matter of concern is the optimal level of insurance. If deterrence is an issue, then there will be a rationale for providing a level of compensation that exceeds the optimal insurance amount in situations where the injury decreases the marginal utility income. This level of compensation will fall short of the implicit value of the injury from the standpoint of prevention because of the inherent trade-off that exists between the provision of incentives for injury avoidance and the provision of optimal insurance.

The effect of the accident on the marginal utility income is an empirical issue. Few would question that severe accidents such as fatalities decrease one's marginal utility income. An individual also could experience a decrease in marginal utility income after becoming a paraplegic or suffering severe brain damage. One cannot generalize, however, to all nonfatal injuries such as disabilities and conclude that the marginal utility of income has been diminished. One might hypothesize, for example, that expenditures on vans, computers, and handicap-accessible houses would be highly valued by many victims of injuries. These types of consumption items, however, are generally included as part of the rehabilitation package, and they need not be considered under the pain and suffering component of the award.

The linkage of pain and suffering at the time of injury to optimal insurance is unclear. At the time when the insurance will be paid, the pain and suffering related to the injury will have already been experienced. Compensation will be paid when the accident victim is healthy. In such a context, it is difficult to justify the award of pain and suffering based on the structure of individual utility functions after the victim's recovery. The primary rationale presumably should be that of deterrence. Society wishes to establish incentives for individuals not to inflict accidents that cause pain and suffering as well as economic loss.

One source of evidence on setting the optimal level of pain and suffering compensation is to determine how much insurance individuals desire in other contexts. Although social insurance purchases for programs such as workers' compensation do not represent voluntary con-

sumer decisions, one can utilize the empirical evidence derived from these efforts to obtain some insight into the optimal level of pain and suffering compensation.

In the case of the workers' compensation program, the general formula for workers' compensation earning replacement provides for two-thirds replacement of gross earnings of workers. The replacement formula, however, is more complicated than a simple earnings replacement rate. It includes a variety of floors, caps, and tax advantages. On balance, the effective rate of replacement of the earnings of typical injured workers exceeds the two-thirds amount.

Based on the rate of wage offset for workers' compensation benefits, one can determine whether the level of insurance being provided is optimal, less than optimal, or more than optimal.⁵ If workers accept a wage cut for additional benefits that exceeds the actuarial value of these benefits, then benefit levels are too low. In the case of the University of Michigan's Quality of Employment Survey, the actuarially fair reference point trade-off rate for an additional dollar of worker compensation benefits is -0.04 , whereas the actual wage offset value for workers is -0.12 . For the 1982 University of Michigan Panel Study of Income Dynamics, the actuarially fair reference point trade-off rate is -0.05 , whereas the actual trade-off is -0.08 . Finally, for the 1982 Viscusi-O'Connor chemical worker survey, the actuarially fair reference point trade-off value is -0.09 , and the observed trade-off rate is -0.15 .

These various studies do not enable us to identify the optimal value of workers' compensation benefits. It is clear, however, based on the excess of the observed trade-off rate above the actuarially fair trade-off rate, that workers would prefer a higher level of benefits than the standard two-thirds wage replacement. These findings do not necessarily imply that workers' compensation benefits are not socially optimal, since moral hazard considerations enter as well. But from the standpoint of optimal insurance, the effect of job injuries on welfare is not so great as to make substantial reduction in the rate of wage replacement below full replacement desirable.

5. The empirical evidence addressed below, most of which is based on my joint research with Michael J. Moore, is discussed in detail in Viscusi (1992, chap. 5).

Another approach that one can utilize to assess optimal pain and suffering compensation is to examine the structure of individual utility functions. Although utility functions cannot be estimated using observed market data, survey data regarding hypothetical market experiments can be utilized. Observations pertaining to the current wage-risk (or price-risk) combinations chosen by an individual can be used in conjunction with the wage increase (price change) that would be required to incur an increase in risk to establish two points on a constant expected utility locus. With this information, one can estimate the structure of individual utility functions and derive from this structure an estimate of the optimal replacement rate, which in turn provides information regarding the level of pain and suffering compensation.

Estimates using logarithmic utility functions indicate that for utility function given by $\ln y$ for workers injured on the job, the estimated utility function when healthy is $1.08 \ln y$.⁶ For lost workday injuries, the optimal replacement rate is 0.85 —greater than the current workers' compensation rate but less than the replacement rate that one would choose if there were full earnings replacement augmented by positive pain and suffering compensation.

Although there is no evidence supporting the desire to ensure pain and suffering compensation in the case of job injuries, for less severe product injuries the evidence is consistent with such compensation.⁷ For eight household injury types such as insecticide inhalation, insecticide skin poisoning, and toilet bowl cleaner gassings, estimated utility functions suggest that the structure of utility functions is not affected. Consumers treated these outcomes as being tantamount to monetary equivalents, where the magnitude of the loss ranged from \$482 to \$2,482 in terms of their equivalent monetary value. In situations in which injuries have an impact that is equivalent to a drop in income, as these minor injuries are estimated to have, it will be optimal to provide for full insurance of the income loss. Thus, pain and suffering compensation is potentially desirable from the standpoint of optimal insurance in the case of these minor injuries, whereas it is apparently not as desirable in the case of more severe outcomes.

6. These estimates reported in Viscusi and Evans (1990) are similar in character to those using other functional forms, such as a Taylor series expansion.

7. See Evans and Viscusi (1991).

Survey Issues

The general approach taken by Calfee and Winston is similar to my work with Evans estimating utility functions. Calfee and Winston also rely on survey data. The main difference is that instead of inferring the optimal value of pain and suffering compensation from estimates of individual utility functions, they confront respondents directly with the pain and suffering insurance questions. The general idea of using survey data to obtain a firmer assessment of the optimal level of pain and suffering insurance is a good one, and the authors should be commended for introducing a new survey approach to this issue.

Calfee and Winston attempt to distance themselves from survey methodologies generally known as contingent valuation. Their approach, however, is very much a contingent valuation study. They use a survey method and a hypothetical market context to elicit individual preferences with regard to potential insurance options. Their approach does not require that individuals assess nonuse values or existence values for scarce animal species, as have some of the more hotly debated natural resource damage assessments. Consequently, their survey is likely to be more pertinent to decisions people actually make than are some contingent valuation studies.

A good feature of the Calfee and Winston survey is that it is not completely open-ended; they attempt to provide some structure—choice among different insurance options—for individuals to make meaningful decisions. Their survey is based on some products that have counterparts in reality and on choices that involve a familiar choice context as well as variants of products with which respondents should be familiar.

Their general survey approach is to ask respondents to rank order a variety of insurance packages. This approach has some antecedents in the contingent valuation literature. The most direct antecedent is the use of a series of paired comparisons in my research with Wesley Magat. We give consumers a sequence of risk-price pairs and iterate these choices until indifference is established. In addition, we have used conjoint analysis that involves a scoring of alternatives based on a quantitative metric. The rank-order approach also bears similarities to the use of a hypothetical referendum in contingent valuation studies.

The Calfee-Winston survey was a mail survey using a sample of experienced survey respondents. The one potential shortcoming of a

mail survey, particularly with fairly difficult tasks such as the ones the authors gave to respondents, is that respondents may be less attentive than they would be in an in-person interview.⁸

The main finding of their study is that the optimal level of pain and suffering compensation is not great and may even be negative. This statement is from the standpoint of insurance, not deterrence. Although the authors emphasize that their survey is still in the “exploratory” phase, the overall character of the results that they find is believable. However, numerous specific questions are raised by their study that merit further exploration since this paper promises to be the first of similar efforts in the future.

Survey Sophistication

In my studies with Wesley Magat, we focused on choice contexts in which individuals were presented with two choices involving two product attributes (price and risk).⁹ Such fairly simple choice tasks involving familiar contexts, such as household insecticides, can be handled by most respondents. Nevertheless, a reasonable number of respondents failed basic rationality tests, such as not being able to identify situations of dominance. In some cases, this failure may stem from not being sufficiently attentive to the survey task. To foster more reliable elicitation of respondents’ preferences, our surveys have incorporated an interactive loop. Individuals who fail the original dominance question are given an explanation of the nature of their mistake and are recycled through the dominance question. This question must be answered correctly before they can proceed with the remainder of the survey. In addition, we have explored a wide variety of consistency tests to determine the within-survey rationality of respondents.

Similar types of issues arise with respect to the Calfee and Winston survey. Even though their survey does not include a loop to educate respondents on consistent choices, it does include dominance relation-

8. Selectivity bias issues also arise with respect to the response rate for the survey as well as with respect to reliance on a sample that is based on a group of experienced survey takers who have volunteered to be regular survey participants in this and other surveys.

9. See, among other studies, Viscusi and Magat (1987); Viscusi, Magat, and Huber (1991); Magat and Viscusi (1992); and Magat, Viscusi, and Huber (1992).

ships that they could explore. In the case of scenario 1a, alternative 2 dominates 3, 7 dominates 8, 10 dominates 11, 11 dominates 12, and 12 dominates 13. What percentage of individuals satisfied all of these different dominance relationships? Assessing these relationships will provide insight into the validity of the survey responses and the degree to which respondents were meaningfully engaged in the survey task.

Even if the simple dominance tests are met, the validity of the responses may be questionable because of the extreme complexity of the survey task. Are individuals truly capable of ranking the various alternatives in the survey time, which the authors estimate to be less than ten minutes? In the case of scenario 1a, respondents are presented with thirteen insurance packages, each of which is characterized by four different attributes. This is a difficult task for professional economists, much less for the representative individuals who are purported to be the target audience. This survey far exceeds the intellectual demands placed on respondents in the typical contingent valuation study or consumer marketing survey. One wonders whether one would elicit the same answer if such a complex task were given to the respondent the next month.

Respondents may answer the survey questions without developing some formal or informal heuristics to cope with the complexity of the choice. If individuals develop their own heuristics, it would be interesting to explore what mechanisms they used to cope with the inordinately complex task. Since heuristics were apparently presented to them, one would want to know which specific heuristics the survey provided them, how these heuristics were used, and whether individuals adopted their own heuristics as well.

Most important, how do these heuristics affect the decision process? The psychology literature on choice under uncertainty suggests that the influence of such heuristics is typically not neutral. Given the complexity of the survey constructed by the authors, we may be measuring the results of decisionmaking with complex choices more than the specific trade-offs of interest. Rather than utilize such a complex formulation with intervening heuristics with uncertain implications, it would be preferable to utilize a more manageable set of choices that are more in line with the respondents' capabilities.

The Abruptness of the Choice

Most households purchase several types of insurance. Thus, the hypothetical market is not completely foreign. It would have been useful, however, to assess the respondents' familiarity with the task since insurance purchases may have been handled by spouses. Moreover, none of the respondents would have familiarity with buying insurance for contexts for which insurance is not now offered, such as those involving pain and suffering. The typical insurance policy is linked more to the nature of the medical treatment than to the level of expenditure.

There is the danger that respondents undervalued pain and suffering insurance because the potential value of such insurance was never adequately explained. The survey, to be successful, must create a choice context for a product that does not now exist. One cannot assume, as the authors appear to have done, that respondents have already thought about why they might purchase this nonexistent product. It would have been useful to include a series of questions to set the context of the survey. The main challenge of any contingent valuation survey is to make respondents think through their hypothetical market decision. This is preferable to abruptly giving them a choice with which they may not yet be familiar.

To establish a meaningful survey context, the survey should have begun by asking respondents what the accident means to them. In particular, the survey instrument should have explored the insurance coverage the respondents currently have, the amount of income the respondents make, and the amount the respondents would like as compensation. The survey should have provided much more detailed information about the health outcomes of the respondent as well as about his likely needs after the adverse event. In the case of scenario 2b, a child is killed, but we don't know how many children the respondent has (if any), whether there are any medical expenses, or why one would even want compensation in such a context. It is no wonder that respondents place little value on such insurance.

In our studies of health outcomes for diseases such as cancer and chronic bronchitis, we have incorporated extensive components of the survey—several times longer than the entire Calfee and Winston survey instrument—to establish what these health outcomes would mean to the individual's well-being. It is certainly not sufficient to tell people

that their child will suffer "brain damage" and leave it at that. Con-
tingent valuation studies such as Calfee and Winston's deal with hy-
pothetical contexts. To obtain results that mirror decisions made in
actual market situations, one must provide sufficient detail for a mean-
ingful decision to be made.

Accuracy of the Risk Information

At various junctures in the survey, the authors give the respondents
risk information pertaining to the probabilities of different events. If
the individuals take these probabilities at face value, then there is not
a major source of error introduced into the analysis even if the prob-
abilities are not correct. If, however, the probabilities do not accord
with individual judgments, there is likely to be a substantial chance
that the responses to the survey will be with respect to probabilities
other than those stated in the survey instrument. In such a case, the
authors' calculations pertaining to the attractiveness of insurance will
not be legitimate. For example, many risk-averse consumers would pay
less than the stated actuarial cost of insurance if the assessed proba-
bilities by the insurer were much higher than those perceived by the
individual purchaser. The authors should provide documentation of the
accuracy of the various probabilities stated in this survey.

Such documentation is particularly important since some of the risks
appear to be surprising. For example, the risk of heart problems from
anesthesia in childbirth is stated as being 1 in 1,000. If indeed the risk
were this high, it probably would provide a fairly compelling case for
natural childbirth. Similarly, the fatality risk of flu of 1 in 10,000 appears
too great for most respondents. If this risk is true, then one would want
to know the pertinence of this probability to the respondent's situation.
The fatality victims of flu are predominantly the elderly, many of whom
face a high mortality risk from a variety of causes. The probability that
is pertinent to most of the survey respondents is certainly much lower
than 1 in 10,000. Ideally, the risks should have been adjusted to reflect
the differing health hazards for younger respondents. It also would have
been useful to include in the questionnaire a section that would, in
effect, debrief the respondents with respect to whether they believed
the stated probability and its pertinence to their own health.

Probability Misperception

Even if the probabilities stated in the survey are correct, individuals
may not perceive them to be so. In situations in which there is individual
control over the risk, individuals frequently underestimate the risks they
face. The situations of automobile accidents and child safety risks are
two of the best-documented instances where individuals believe that
their own risks are much lower than those of the typical driver and the
typical household. Roughly 80 to 90 percent of all respondents believe
that they are safer than the typical individual for situations in which
there is control over the risk.¹⁰ If individuals underassess the risks they
face because of their control over the risk, then this would affect the
interpretation of the results since the attractiveness of insurance is gov-
erned by the probabilities perceived by the insurance purchaser, not the
probabilities stated in the survey.

Some of the articulation of the risk information in the survey also
could lead to risk misperception. Scenario 2a, for example, indicates
that there will be a decrease in the child safety risk, but presumably
this safety improvement would affect the safety of other passengers as
well. How did respondents process this information?

If there is misperception of the risk information for whatever reason,
then this bias not only affects the responses to particular questions, but
also may contaminate the results elsewhere in the survey because of
the chaining of the information in the survey structure. For example,
if the stated probabilities are above the perceived probabilities, the
survey will generate an underestimate of the implicit value of life in
scenario 7a. The \$1 million value of life in that scenario is at the
relatively low end of the value of life range in the literature. This bias,
in turn, will lead to implicit risk assessments elsewhere in the survey
that will be estimated as being too high.

The authors should recognize that choices under uncertainty—and
particularly those involving low-probability events—tend to be fraught
with various irrationalities. What one may be estimating in many cases
is not the underlying preference individuals may have but rather the
limitations on choices in highly complex situations.

10. See Viscusi and Magat (1987).

One of the implied probabilities identified by the authors is that respondents act as if the perceived probability of death for a child who spends one month at a day camp is 1 in 1,500. This fatality risk in the day camp is roughly comparable to the annual accident risk faced by a worker in a high-risk construction job or that of a manufacturing worker during ten years of work on an assembly line.

Viewed somewhat differently, three months at a day camp would pose a fatality risk of 1 in 500. (One hesitates to estimate the risks associated with overnight camp.) If 30 million children were to spend their summers at a day camp, these estimates would imply that 60,000 would die. My own estimate, based primarily on parental observation, is that the risks perceived by the Calfee-Winston respondents are off by a factor of at least 1,000.

This result highlights a major problem in dealing with low-probability events. Individuals have some difficulty with probability contexts of any kind, but it is especially difficult for them to make distinctions between risks of 1 in 1,000, 1 in 10,000, or 1 in 100,000, much less some of the refined distinctions that are pertinent to the risks associated with the types of events treated in the survey.

The result may be wildly inaccurate implications in terms of individual behavior. For example, in a study of bleach gassings from toilet bowl cleaner, Wesley Magat and I found that for risk reductions of 1 in 1,000,000, the implied value of this health outcome was \$1.78 million dollars. For risk changes on the order of 15 in 10,000, the implied valuation of the health outcomes was \$1,113.¹¹ Changing the denominator of the risk question altered the implicit value of an injury by a factor of 1,000. The major difficulty that individuals had in this case is that they tended to overestimate risks of low-probability events that are called to their attention.

More generally, we have very little experience in observing situations where we get a million draws from an urn to develop expertise in dealing with extremely low-probability events. Making any kind of decision with respect to such small risks is difficult, much less the types of difficult tasks that are imposed on the respondents by the Calfee and Winston survey questions.

11. These survey results and the sources of the difference are discussed in Viscusi (1992, chap. 4).

Valuing a Loss

Any respondent attempting to assess the value of insurance coverage presumably needs to know the nature of the loss being insured. The survey could have been more detailed than it was in explaining the character of the loss. For example, scenario 6a indicates that the child will be handicapped at birth and must undergo several operations. In the words of the survey, this will make the child "quite unhappy." A child with an irritable stomach who needed burping might be characterized similarly. The cost to the parents and the effect on their lives of these operations are not discussed even though such health outcomes are likely to be disruptive and stressful.

The survey questions need more elaboration in other cases as well, such as the case of a crippling accident to the child in scenario 3b. Will there be any future income loss to the child? If so, insurance will become more attractive than if there were no income loss.

Baseline Coverage

To assess the desirability of insurance, it is essential for the survey to include information on the current life insurance, automobile insurance, medical insurance, and disability coverage of the respondent. Obtaining this information from the individuals who are surveyed would also enable them to think about the survey task and put the hypothetical insurance policies into context in terms of their own financial situations. Such questions consequently would be part of the attempt to create a market context that does not, in fact, exist.

A second purpose would be served by these questions. It is impossible to determine the desired level of pain and suffering coverage without knowing the existing coverage that an individual has for the various events discussed in the survey. For example, if an individual already has full insurance coverage, then all additional insurance is for pain and suffering, not simply the amount above replacement of the economic loss. In order to interpret correctly whether there is any desire to have pain and suffering insurance, one must know what insurance the individual already has.

For several of the scenarios, the survey, in effect, asked individuals to act as if certain classes of expenses were fully covered. More affluent respondents would know that many of the losses, such as disability

effects, receive only partial coverage. Very poor respondents may not have any insurance and may not believe that any of these losses are covered. It would be useful to analyze the relationship of the amounts of current insurance coverage to the responses in an effort to ascertain the extent to which individuals adopted some of the hypothetical assumptions stated in the survey.

Unclear Language

Perhaps in part because the survey instruments were so numerous, they do not appear to have been sufficiently pretested to eliminate all situations of unclear language. Most readers of the Calfee and Winston paper will not encounter difficulties, but the more representative survey respondent may.

In some instances, such as scenarios 4a and 4b, in which an individual faces a complicated operation for a head injury, it is unclear what the purchase of the drug through the shots will achieve. This process is not made any easier for respondents by the presence of dominated alternatives. For example, in scenario 4a, alternative 3 has the same side effects as alternative 2 with the same shots but at a different price. Alternative 6 costs more than alternative 2 even though there are no shots with alternative 6 and shots with alternative 2. In this case the operation seemed to be the same, but the individual is given a \$300 discount if he receives the shots.

In scenarios 3b and 4b, money is being paid out for income losses that is "in addition to payments for medical expenses." What exactly does this mean? Do all the options provide for medical expenses—even those such as package 1, package 4, package 6, and package 9 in which there is no insurance payout of any kind? Is there any linkage between the insurance payout and the medical expenses payment?

There also seems to be a mismatch between the character of the injury and the nature of insurance. Scenario 7b pertains to the risk of death from taking a vaccine, but the insurance payout is for "disability." It is also difficult to understand what that scenario means in terms of the degree of pain. Shots are rated as being "more painful" or "less painful." Which hurts worse, the alternative 4 scenario with one shot that is "more painful," or the alternative 11 scenario in which there are three shots that are "less painful?" More fundamentally, is this

degree of pain likely to be of consequence? What does this degree of pain mean in absolute terms? There are no reference points given for respondents to put it in perspective.

Conclusion

Like many early forays into a survey area, this survey structure raises almost as many questions as it answers. Because of the difficulty of the subject matter and, in particular, the substantial problems individuals have in making decisions with respect to risky choices, I suggest that subsequent versions of this survey deal with a more limited set of options, make a better attempt to create a meaningful decision context, and recognize the limitations that individuals have when making complex choices under uncertainty.

If there is any greater deficiency of this survey instrument, it is that it places such severe demands on respondents that they may be unable to give meaningful answers to the survey questions. These limitations arise in part because of the more general problems individuals have in making complex choices under uncertainty. These difficulties might not be as consequential in contexts where the choices involved were simpler.

Calfee and Winston have, however, embarked on a useful approach to ascertain the private value of insurance for pain and suffering compensation. This is an area in which the courts lack precise economic guidance. The optimal value of pain and suffering from the standpoint of deterrence is much better understood. The use of a survey methodology such as that introduced in this paper can potentially resolve the effect of injuries on the marginal utility of income and hence on the desirability of insurance. Whatever progress economists make in this area is likely to be the result of using surveys, such as this one, that create structured choice situations rather than rely on existing market data. The authors' overall research strategy of utilizing a survey approach is consequently quite sound and should provide the basis for future work on this difficult and important legal issue.

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