

MISUSES AND PROPER USES
OF HEDONIC VALUES OF LIFE

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by W. Kip Viscusi*

Abstract

Estimates of the statistical value of life have become the standard reference point for valuing risks to life and health in regulatory contexts. Attempts to use these estimates in courtroom settings as a measure of compensation are misdirected. The value-of-life estimates are based on a deterrence or prevention concept rather than an insurance concept and will provide overinsurance to accident victims. Value-of-life estimates are, however, pertinent for use as reference points in assessing liability. Possible examples of where it can be used include cases such as the Ford Pinto and GMC truck burn cases.

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1. Introduction

Valuing life has proven to be one of the most controversial areas in economics. By necessity, society must make resource allocation decisions that at least implicitly value life. The government, corporations, and individuals are among the entities that confront such risk tradeoffs daily. When these decisions turn out badly, the courts often become involved. Although value-of-life discussions have aroused controversies in all these domains, nowhere have they been sharper than in the context of litigation.

The tensions arising within judicial contexts are not unexpected. The situation itself is inherently adversarial, often with tremendous stakes. Whereas decisions involving government risk policies deal with prospective statistical lives, court cases address actual identifiable deaths. Society has long displayed more attention to identified lives than to statistical lives that prospectively might be saved. Even beached whales and identified animal lives often command more attention than statistical human lives. When these concerns with identified victims are coupled with an economic methodology that purportedly provides a justification for enormous awards, the consequences could transform the liability landscape.

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The high stakes methodology of hedonic damages first was accepted by the courts in the 1980s.¹ Efforts to adopt this concept broadly have not succeeded. Thus, while hedonic damages are not entirely absent from wrongful death calculations, they have not taken hold and become widespread as the state of the art approach to valuing wrongful deaths.

This article explores the underlying economic merits of the value-of-life methodology and its use in the courts. More specifically, it examines whether this concept has any valid use in the courtroom at all and, if so, in what contexts. Section 2 considers the value-of-life concept and various arguments that have been lodged against it. Section 3 examines why hedonic damages as they are traditionally formulated as a damages concept are not warranted. Section 4 considers how such value-of-life measures still have a constructive role to play in legal proceedings in assessing liability and making judgments such as to whether a defendant was guilty of negligence. Section 5 concludes with observations about the failure of the courts to properly integrate new and pertinent developments in economic analysis.

2. Why the Value of Life Is Sound Economics

Economic Foundations

The basic value-of-life approach in economics deals with lotteries on risks of death. Thus, rather than focusing on identifiable deaths either prospectively or after the fact, the issue is in terms of statistical risks. How much should the government spend to reduce the risks of highway deaths or fatalities from air pollution? How much should

¹ See Ward and Ireland (1996) for a review of these issues and the pertinent court cases.

companies spend to decrease the risks that products pose to consumers and that jobs pose to its workers? How much of a pay increase do workers need to accept hazardous jobs? How much more are consumers willing to pay for safer products that pose less of a threat to their lives?

As it turns out, the answers to these questions are interrelated. In a market context, the tradeoff individuals are willing to make between money and risk will be the same as what firms face in terms of the provision of safety. Looking across different dimensions of choice, a consumer will seek similar tradeoffs if options available are continuous. Thus, if improvements in safety are achievable for \$500,000 per statistical life by buying a safer car as opposed to \$10 million per statistical life by removing the asbestos from one's basement, it will be preferable to spend one's life-saving dollars on the more cost-effective option that has a lower cost per life saved. The government likewise makes tradeoffs, but there is no comparable market process at work. As a result, the government routinely uses value-of-life estimates from the market in making its deliberations concerning risk reduction policies.

The underlying theory pertaining to the value of life is straightforward and has been accepted in the economics literature since the time of Adam Smith (1776). Workers will demand compensating differentials for jobs they perceive as hazardous or otherwise unpleasant in some respect. Consumers will be willing to pay less for hazardous products. Similar tradeoffs of this type will generate estimates of the implicit value of statistical lives based on money-risk tradeoffs in the marketplace. For example, suppose that a worker is willing to accept an additional annual fatality risk on the job of one chance in 10,000 in return for an extra \$500 in compensation. The estimated value of life

is the amount of this compensation divided by the probability, or \$500 divided by 1/10,000, which yields a result that the value of life is \$5 million.

What does the figure mean? All that it indicates is that people are willing to trade off small risks of death against money using this tradeoff rate. For small changes in risk, willingness to pay tradeoffs and willingness to accept values will be the same. For more substantial risks of death, the tradeoff will be quite different. Willingness to pay and willingness to accept amounts will differ. In particular, if people must buy out of a risk that is very large, the terms of trade will drop because of wealth effects. People may be willing to act as if their value of life is \$5 million for small risks even if they have modest resources. However, buying out of large risks at the tradeoff rate of \$5 million per life may be infeasible. The value of life based on very large risks consequently will be under \$5 million. If, on the other hand, one were to increase the probability of death substantially and pay the potential victim for the increases, the implicit value of life would rise well above \$5 million. Willingness to accept values for very large risks accordingly will be higher. In the case of an individual facing certain death, no amount of bequest to one's heirs may be adequate to make one willing to incur such a dire prospect.

This result for the willingness to accept value has an important implication for the role of the value of life as a compensation concept. In no way does the \$5 million value of life make the accident victim whole after death. Indeed, it is not a retrospective measure of compensation or insurance at all. Rather, it is a prospective measure of the risk-money tradeoff one wants to strike to establish efficient levels of health and safety risks based on one's own attitude toward bearing these risks. In contrast, the courts focus

in a retrospective manner and, in the setting of damages, also have a compensation orientation.

Empirical Estimates

A substantial economic literature has documented these values empirically. Most of these studies have relied on estimates from the labor market because these data provide much more detailed information on risks and the characteristics of the market transactions generating these risks, in this case worker and job characteristics. Other estimates from the housing market and from automobile purchases yield similar values. The most comprehensive reviews appear in Viscusi (1992a, 1993, 1998) in which I summarize the implications of these various empirical studies. In present dollars, the estimates of the value of life cluster in the range from \$3 million to \$9 million. Similar values hold for foreign countries as well.²

These estimates have proven to be of more than academic interest. They have also been adopted for use throughout the U.S. federal government. The use of these value-of-life estimates was begun in my 1982 report that I prepared to settle the dispute between the Occupational Safety and Health Administration (OSHA) and the U.S. Office of Management and Budget (OMB) over the OSHA hazard communication standard.³ That regulation had been appealed to then Vice-President Bush because of a controversy over the benefits associated with the proposal. OSHA had evaluated the lost lives that would be saved by the regulation using the cost of death methodology which in effect considered only the medical costs and lost earnings associated with death. However, in

² See Kniesner and Leeth (1991) for assessments for Japan and Australia.

the analysis I prepared for the U.S. Secretary of Labor I showed that use of the proper value-of-life estimates boosted the benefit estimates by a factor of 10, making the regulation that OMB had shown did not meet a benefit-cost test now in the economically viable range as benefits exceeded costs using the proper value-of-life estimates. The day after my report supporting the regulation reached the Reagan White House the regulation was issued.

Government agencies thereafter began to adopt this methodology to an increasing extent. At the present time it is now the procedure that the U.S. Office of Management and Budget recommends for benefit assessment by all government agencies.⁴ Agencies' enthusiasm for the approach may stem not so much from its economic validity but from the fact that it boosts benefits by a factor of 10. In much the same manner, plaintiffs' lawyers often view the hedonic value-of-life methodology approach as a means to increase the court award by a factor of 10 and, in some cases, to generate a multimillion dollar award when there is no hope of much compensation at all based on more conventional approaches.

Incorrect Arguments Against the Methodology

As I will indicate below, there are many legitimate arguments for why the courts should not adopt this methodology universally, even though the government has done so

³ In Viscusi (1992) I provide a summary of this report.

⁴ See the U.S. Office of Management and Budget, Regulatory Program of the United States Government, various issues.

for its risk regulation policies. However, there are also some incorrect arguments against the value-of-life methodology that are inappropriate.⁵

The first argument is that these estimates are too big relative to a person's income. How, for example, could a blue-collar worker afford to pay \$5 million to prevent his or her death? This value clearly exceeds the budgetary constraint likely to be in place. However, no payment of \$5 million ever arises as part of the economic experiment that is being run. These estimates do not apply to purchasing a reduction of the risk of certain death. Extrapolating multimillion dollar value-of-life estimates which are based on the tradeoff rate involving small risks to situations posing much greater risks is inappropriate. Moreover, this comparison to the individual's budget constraint is entirely irrelevant in judging whether a person might be quite willing to spend substantial amounts to avoid very tiny risks. If, for example, a worker making \$30,000 a year was willing to take a \$2,000 pay cut to eliminate the one chance in 10,000 of dying on the job that year, that decision would not necessarily be irrational. Yet, it reflects an implicit value of life of \$20,000,000, which is not only more than the worker's current assets but also more than the worker's lifetime wealth. Comparisons to budget constraint limitations neglect the fact that the value-of-life methodology pertains to risk-money tradeoffs with small probabilities, not certain death. Such arguments against the hedonic value-of-life approach reflect a basic misunderstanding of the underlying economics.

A second flawed argument against the value-of-life estimates is that the empirical findings are too imprecise for use in the courts. According to this argument, the estimates are fraught with error and vary wildly from study to study so that there is no

⁵ Havrileskey (1996) provides a summary of many of the more thoughtful criticisms.

legitimate scientific basis for employing the methodology. This argument is also incorrect. Indeed, in Viscusi (1992a, 1993, 1998) I reviewed dozens of peer reviewed economic assessments of the implicit value of life in a variety of market contexts. There is no underlying economic reason why these estimates should be identical for the different studies. Tradeoff rates reflect the risks and attitudes toward risk of the populations being studied, and these preferences can differ just as do our attitudes toward other goods. The risk levels are often quite different, as are the samples of workers exposed to the risk. The value of life is not a natural constant that is invariant across the population but rather will vary with the preferences and the risk reduction opportunities available in different contexts. Thus, we would expect to find quite different estimates of the implicit value of life based on different studies comprising different sets of workers or other hazardous products.

It should also be noted that while there are precise estimates of some economic magnitudes, such as the rate of interest, other well established areas on inquiry often yield quite different estimates as well. Consider, for example, estimates of the price elasticity of the demand for cigarettes. In Viscusi (1992b) I present a comprehensive review of the literature on these demand studies in which we find that even the price elasticity estimates span a considerable range of values, with most estimates ranging from -0.4 to -1.0, which is a factor of 2.5. Many estimates lie outside this range. The use of different data sets involving different time periods and different samples will contribute to this variation in much the same way as economists estimating the value of life have found quite different estimates in their various studies.

The final argument against the value-of-life approach is that it is immoral to value lives. Indeed, one philosopher who commented on one of my earlier papers involving the value of life remarked that it was the most immoral paper that he had ever read. However, most of these critiques reflect a basic misunderstanding of what the economic value-of-life approach actually does. The usual assumption is that economists are equating the value of life to a person's earnings or some presumably pertinent "economic" measure. However, this is not the case. Moreover, these critics often fail to grasp the fact that what is being valued is not the certain life of any individual but rather the amount of money that is being spent to reduce the risk by a small amount or the amount of money the person needs to be compensated to accept a very small risk. Moreover, the actual values to be placed on these risk-money tradeoffs do not come from an economist or a philosopher or government officials who are attempting to impose their preferences on others. Rather, economists have sought to respect the preferences of individuals who actually are at risk by estimating what people's own tradeoffs are between risk and money and using these estimates to guide government policy. It is for this reason that government agencies have ultimately found this methodology compelling and why it is so widely used in economics literature.

3. Why Hedonic Damages Are Not Warranted

Appropriate Compensation Concepts

The attractive features of the value-of-life approach might lead one to think that carrying them over to the courtroom and using them as the estimate for setting damages in situations of wrongful death would be appropriate as well. However, such a use of the

value-of-life approach is typically incorrect as it is currently applied. The estimates of the value of life are not a substitute for compensation amounts in the case of the wrongful death. Thus, if the question being posed by the court is how much should the survivors be compensated for the death of the person, that is a question pertaining to insurance. However, the value-of-life estimates reflect the risk-money tradeoff pertinent to setting an efficient level of safety and for determining the appropriate amount of deterrence.

In case of financial loss, the objective of compensation is to make the victim whole after an accident. That approach will not only create efficient incentives but will also create optimal insurance. However, in the case of wrongful death the amount of compensation needed to make the victim whole may be infinite. No amount of money may suffice. Moreover, making the victim as well off after death as the victim would have been had he or she not been killed would create excessive amounts of deterrence and overinsurance.

An alternative to making the victim whole is to set the level of compensation equal to the value-of-life estimates. That amount of compensation would provide efficient deterrence if there otherwise were no economic incentives operating. However, it will also create excessive insurance for the survivors. Consider the case of a person killed by a hazardous product that has a 1/10,000 chance of causing death. For simplicity assume that the safety level is fixed so that we can focus solely on the insurance aspect. Would this consumer have been willing pay \$500 more for this product to know that if the product killed him that his survivors would receive \$5,000,000 in compensation? That amount of insurance would clearly be excessive and will dwarf the amount of coverage that most people voluntarily choose for life insurance. From an economic

standpoint, compensating people according to the value-of-life estimates will provide too much insurance and this will be inefficient generally. Moreover, in situations in which there are market transactions for hazardous products or risky jobs, this high level of compensation will also generate burdens on consumers and workers who will be in effect purchasing too much insurance through the higher prices they pay and the lower wages they receive because of these excessive damages levels. In the courtroom it may seem as if such high penalties only harm the defendant, such as a corporation. In reality, the harm will ultimately be transmitted back to consumers who pay for the implicit insurance costs associated with the purchase of risky products.

The real problem is that there is a mismatch between the underlying theory for the value of life and the use of this measure as a compensation mechanism. The value of life is not a measure of compensation except when dealing with people's rate of tradeoff involving small risks. The methodology does not provide a measure of the value of the amount the person would want to be compensated after a fatality, which is the way in which the courts have been primarily using the hedonic value-of-life estimates.

How can it be that it is appropriate for the government to use these values but not the courts? When the government uses the value-of-life estimates it is for the purposes of benefit assessment. The actual risk-money tradeoffs reflected in government policies often turn out to be quite different than the underlying value-of-life figures because of restrictive government mandates that often do not permit benefit-cost balancing. Thus, it is also wholly inappropriate to use the cost per live saved figures for government regulatory programs as a measure of the appropriate tradeoff since these tradeoffs often reflect narrow legislative restrictions imposed by Congress rather than an explicit

judgment that these tradeoff rates are sensible. For example, Hamilton and Viscusi (1999) have found that the Superfund program imposes costs of at least \$6 billion per case of cancer prevented. If one were to use that figure as a yardstick for the appropriate amount of a court award in every situation involving a wrongful death, the annual amount of court awarded compensation for accidents would exceed the GDP. More to the point, such compensation would bear no relationship whatsoever to efficient compensation or insurance. Thus, the fact that the government uses these numbers for some purposes in no way implies that the courts should use them for purposes of compensation.

Psychological Rating Scales

The way in which these value-of-life estimates are often applied in the courtroom also reflects a misunderstanding of what these estimates mean. In some instances, the plaintiff's expert uses a psychological scale to measure the individual's well-being. I have seen such scales used both with respect to disabilities as well as the psychological damage caused by the Exxon Valdez oil spill. Such qualitative scales from 0 to 10 have no cardinal significance. More important, they also have nothing to do with the value-of-life estimates with which they are linked in the court. Suppose that the person claims to have been a 9 on this scale before the accident, but has since suffered a disability and now rates himself as being a 4.5. As the plaintiff's expert's reasoning goes, his welfare has been reduced by 50 percent. Should this person not receive one-half the value of his statistical life or, using a \$5 million value-of-life figure, \$2.5 million for the disability?

The fallacy of this approach is that these psychological rating scales bear no relationship whatsoever to the underlying value-of-life methodology. The compensation

workers receive is not with respect to a qualitative rating scale that has no quantitative significance whatsoever, but rather with respect to the probability of death. The valuation is with respect to risk lotteries. Is a reduction in one's happiness score from 9 to 4.5 really equivalent to facing a 50/50 chance of death? Moreover, will this decline in fact be permanent, or is this a temporary drop from which the victim is likely to recover over time as he becomes more accustomed to the ailment? The value-of-life linkage derives from a lottery on life and death, not a score on any happiness scale or psychological rating approach.

The psychological rating scales also raise problems with respect to accurate revelation of one's psychological condition. There would be an obvious incentive for a plaintiff to overrate his or her pre-injury happiness level and to underrate the post-injury level of happiness. These practical problems create additional biases in what is already an entirely inappropriate technique for matching up with value-of-life estimates.

Pain and Suffering

There have also been attempts to use the value-of-life estimates to obtain a value of pain and suffering. Suppose, for example, that a person's value of life from the standpoint of willingness to pay to avoid a statistical death is \$5 million and that his lifetime earnings is \$1 million. As the reasoning goes, one simply can subtract the financial loss of \$1 million from the total value of life of \$5 million to obtain the value for the lost enjoyment of life. Such calculations have no validity whatsoever and reflect an underlying misunderstanding of the value-of-life concept.

The value of life is not a total figure that represents the lump sum amount that one could receive and be indifferent between life and death. If it were, one could readily parcel out the financial earnings component and the nonfinancial component. However, it is something quite different as it only reflects a rate of tradeoff involving small probabilities of death. As the theory above indicates, a person would not be indifferent to losing one's life in return for a \$5 million payment, and similarly a person would not pay \$5 million to avoid the prospect of certain death. These are quite different amounts and involve quite different economic circumstances than those being addressed by the value-of-life literature, which are restricted to extremely small probability events. Thus, the value-of-life reference point that comprises the first part of this calculation derives from a lottery, not from a certain payment.

In contrast, the analysis of a person's lifetime earnings is a certain amount. One is not asking the question of how much one would pay to avoid a one chance in 10,000 of losing one's entire earnings potential for the rest of one's life, which would be an analogous comparison. Moreover, even if one obtained the results to such a lottery-based question, there is no theoretical reason why one could not simply subtract this number from the total value of life to obtain the value for the lost enjoyment of life. The value-of-life estimates embody both these pecuniary and nonpecuniary consequences, but they do so within the context of low probability lotteries, not certain events.

The economics of pain and suffering compensation has even more disturbing implications for experts attempting to testify on behalf of pain and suffering damages. If the rationale for the pain and suffering compensation is deterrence, then potentially one can make a plausible argument for creating a greater deterrent effect in situations in

which there is additional pain and suffering losses as opposed to simply a financial loss. However, deterrence is usually the province of punitive damages rather than compensatory damages.

A second rationale for pain and suffering is the pragmatic rationale. Plaintiffs rarely receive the entire value of the damages award. Lawyers working on a contingency fee basis will typically receive one-third of the damages amount. This value for compensating the attorneys will create a spread between the total compensation paid and the total amount of compensation received by the injured party. Failure of juries to compensate plaintiffs for attorneys' fees as well as their financial losses will lead to inadequate insurance. Indeed, my examination of over 10,000 closed product liability claims in Viscusi (1991) found that the level of pain and suffering compensation was roughly at the same percentage as one would expect for attorneys' fees.

If, however, one were to exclude such considerations and seek to justify pain and suffering compensation based on an insurance rationale, that effort would be misdirected. Estimates reported in Viscusi (1992a) indicate that after accidents the marginal utility of income the individual has is lower rather than higher. Because accidents impede the individual's ability to derive additional well-being from expenditures of money (excluding of course medical care and rehabilitation expenses which are covered under separate damages components), it will not be optimal to obtain insurance for pain and suffering. Put somewhat differently, it would not be rational for an individual to buy an insurance policy in which he or she in effect transferred income from the healthy state to the injured state because doing so would transfer income from the state in which the marginal utility of income was high to the state where the marginal utility of income was

low. Thus, if the object is insurance and this is the only concern, then there is no rationale for pain and suffering whatsoever.

Anchoring Effects

Given the considerable fallacies involved in applying hedonic damages as a compensation approach, why do plaintiffs' attorneys persist in seeking to have this approach admitted in the courtroom? The reason stems not so much from economics but rather the psychology of jury behavior. Even if the value-of-life number is disputed, having an expert testify that the damages should be \$5 million, for example, establishes an anchor for the jury. The lawyers may simply want to get a big number on the table to get the jury thinking in terms of millions rather than thousands. Perhaps if they have doubts regarding the methodology they will simply split the difference and award \$2.5 million, which is still a fairly lucrative payday. Boosting the award level is not, however, a legitimate justification for misusing the value-of-life methodology.

4. Contexts Where Using the Value of Life in the Courtroom Is Sensible

Assessments of Liability

Although the value-of-life approach should not be used routinely for setting compensation in accident contexts, it nevertheless does have a legitimate role in torts cases. By far the most salient role should be with respect to the determination of liability. Did the company make an appropriate investment in safety with respect to a product that is the subject of the court case? Similar questions can be asked concerning environmental risks, medical malpractice preventative measures, and other safety

enhancing actions that are the object of court cases. When judging the adequacy of these efforts and whether they are in fact efficient, the value-of-life approach provides the yardstick for making such determinations. Suppose, for example, that we accept \$5 million as a midpoint estimate of the value of life. If a company spent that much money per statistical life to be saved by safety improvements, and if additional improvements in safety would have cost more than that amount, then the company should not be found negligent for its safety level.

Thus, the value-of-life methodology can be broadly used in determinations of whether the product design was defective and whether the defendant met its responsibility to provide a reasonable level of safety. Such notions are often implicit in the risk utility test as well as in the Learned Hand formulation of the negligence standard.⁶ However, by applying a benefit-cost analysis to safety decisions using the value-of-life approach one can make a determination of whether the behavior was efficient rather than relying on the often more subjective and erroneous judgments made by jurors.

The Automobile Accident Experience

The experience in previous court cases in which there has been no attempt to properly educate juries with respect to the value of life and how this methodology should be used in assessing liability has led to some very extreme outcomes. Many of these adverse events had involved the automobile industry and safety measures for cars such as

⁶ See, among others, Polinsky (1989), Posner (1998), Shavell (1987), and Viscusi (1991).

the Ford Pinto, Ford Mustang, Chrysler Minivan, and the Chevrolet Malibu.⁷ In a 1999 case in Los Angeles involving the Chevrolet Malibu, victims were awarded \$100,000 million in compensatory damages and \$4.8 billion in punitive damages after six passengers were severely burned but not killed by a rear end collision. One of the company's reckless acts in the eyes of the jury was that an engineer at General Motors did a benefit-cost analysis using value-of-life estimates. The practice of undertaking such estimates should not be discouraged, but in fact should become the norm in product risk contexts. Moreover, the value-of-life methodology provides an economic reference point for determining whether corporations have in fact fulfilled their legitimate obligations to promote safety. In some instances these corporate decisions have fallen short by using value-of-life figures such as \$200,000. But the real economic problem is not that they made a finite tradeoff between money and lives but that they often did not use the appropriate value-of-life figure in making such a determination. There is at present a considerable opportunity to use the value-of-life concepts more broadly in such courtroom deliberations. Until now the focus has been on misusing value of life to determine compensation whereas its natural role is in assessing liability.

One problem to date has been that the Pinto analysis by Ford and the analysis by General Motors engineer Edward Ivey of fire-related deaths used inappropriately low values of life. For example, what would the reaction of jurors be if the company used values of life that are more in line with those employed in the value-of-life literature and by regulatory agencies? Would they be willing to accept such values as a reasonable approach to setting safety levels?

⁷ In Viscusi (2000) I provide a review of these cases.

To explore such issues, in Viscusi (2000) I presented a series of cases to a sample of almost 500 jury-eligible citizens. Some respondents considered situations in which the company undervalued life as in the Ford and GM analyses. Other respondents considered a scenario in which they were told that the company followed the same procedures used by the National Highway Traffic Safety Administration in valuing life. Moreover, they also used the value-of-life figure of \$3 million, which they were told was the value that was currently used by the government in valuing automobile safety policies. How would jurors react to seeing a more valid value-of-life approach? The disturbing result was that jurors were somewhat more likely to award punitive damages than if the company undervalued life by using a figure such as \$200,000. The more dangerous result was that the higher value-of-life figure led to an increase in the amount of punitive damages that the jurors would award. By using a higher value-of-life number, jurors felt that they would send the company a message by imposing a higher damages amount than they would have had the company undervalued life. Use of more appropriate value-of-life statistics consequently may serve as an anchor that boosts jury awards rather than decreases them.

Whether corporations undertaking risk analyses can ever be successful in convincing jurors of the rationality of this approach is yet to be seen. However, from the standpoint of legal determinations of liability, use of the value-of-life figure is certainly the appropriate methodology. To determine whether the company has invested appropriately in safety measures one should determine whether the cost per life saved is above or below a critical value-of-life number. If this value-of-life reference point is \$5 million, then product safety investments that would have saved lives at a cost of \$3

million per life should have been made. Failure to do so should lead to the jury finding that company liable for the accident related injuries. In contrast, if the safety investments cost \$8 million per life saved, then such life saving amounts would be unjustified given the appropriate reference point for valuing human life in this particular context.

Use of the value-of-life figure and the benefit-cost approach to valuing life will provide an analytical basis for juries to make decisions regarding liability when there are choices being made by companies or other defendants regarding the extent of their investment in safety. Shifting to this kind of approach also can remedy some of the narrow biases that arise with respect to jury deliberations. The question facing the jury is often whether a small additional investment in a safety part for a particular automobile was really more costly than the identified human life that was lost because of the accident. The more appropriate question to be asked is whether on a prospective basis the total cost of the safety measure exceeded the loss of the statistical lives due to the prospective accident, where these lives are valued using the value-of-life statistics discussed above. Thus, the value-of-life methodology should be at the heart of all liability judgements of this type.

The value-of-life estimates also might be useful in punitive damages contexts. What amount of money is needed to give the firm the proper incentive to reduce the risk of a fatality? That figure is what the value-of-life estimate tells us. Awarding \$4.8 billion in punitive damages to six burn victims is \$800 million per burn victim. Such punitive damages exceeds the appropriate deterrence value-of-life figure by roughly a factor of 100. Thus, use of the value-of-life estimates as an upper bound in such punitive damages contexts might provide some discipline to an otherwise rudderless jury. In this

case, the jurors used the value of GM's advertising budget as the reference point for the award. Such irrelevant anchors establish an inappropriate basis for setting damages levels.

Use of the value-of-life estimates for punitive damages would, of course, have to take into account other considerations as well. It may be that there are other safety incentives operating, including regulatory sanctions, so that no punitive damages are warranted at all. As suggested in Viscusi (1992a, 1998), this may be the case broadly in health, safety, and environmental contexts in the United States. Moreover, some authors have suggested that the probability of detection should also be taken into account.⁸ However, these complications are essentially refinements. The basic point is that the value-of-life estimates do provide an appropriate reference point for the price society should pay to eliminate small risks of death. Use of this value in determinations of liability and related deterrence matters is not only entirely appropriate but is a long overdue innovation in the courtroom.

5. Conclusion

Litigation is not the ideal context for fostering the development of economic methodologies. The experience with respect to contingent valuation is particularly noteworthy. That methodology was still in its formative stages when it was introduced in cases such as the Exxon Valdez oil spill.⁹ The result was that the methodology itself

⁸ See Polinsky and Shavell (1998).

⁹ I served as an expert on behalf of the U.S. Department of Justice and the National Oceanic and Atmospheric Administration in that case.

became suspect and its development was set back by its possibly premature introduction in high stakes litigation.

The time line for the value-of-life research based largely on hedonic wage and hedonic price equations was much different. The underlying economic principles have been with us for over two centuries. The econometric issues had been explored by Griliches (1971) and others in the price context for decades. The theory for the value of life was furthered by Thomas Schelling (1968), who made clear that it was tradeoffs involving lotteries and statistical lives that were the matter of interest, not the certainty of death. Economic research in the late 1970s and 1980s established a variety of empirical estimates of the value of statistical lives, and by 1983 the methodology had begun being used by the Federal government.

Subsequent use in the courtroom was in no way premature in terms of the stage of the development of the underlying economics. However, the uses to which the estimates have been put have not been consistent with the meaning of the estimates or the purposes of compensation in tort cases. Instead, the hedonic values of life provided a mechanism for plaintiffs' attorneys to get multi-million dollar damages numbers in front of juries in the hopes of providing a high dollar anchor for their deliberations. The danger is that compensation based on these estimates provides excessive insurance.

What is striking is that there has been no effort to put these estimates to their legitimate use. The value-of-life statistics should play a central role in deciding issues pertaining to liability. Moreover, they can also provide an upper bound on the value of punitive damages that might be reasonable in wrongful death cases. The hedonic value-

of-life topic should remain pertinent to litigation for many years to come but in a much different context that this methodology has been employed to date.

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