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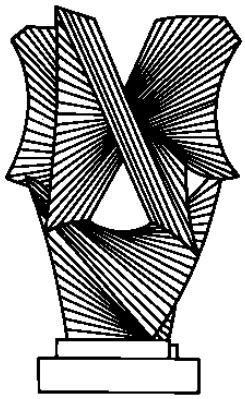

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Abstract. Administrative regulations and tort law both impose controls on activities that cause mortality risks, but they do so in puzzlingly different ways. Under a relatively new and still-controversial procedure, administrative regulations rely on a fixed value of a statistical life representing the hedonic loss from death. Under much older law, tort law in most states excludes hedonic loss from the calculation of damages, and instead focuses on loss of income, which regulatory policy ignores. Regulatory policy also disregards losses to dependents; tort law usually allows dependents to recover for loss of support. Regulatory policy generally treats the loss of the life of a child as equivalent to the loss of the life of an adult; tort law usually treats the loss of the life of a child as less valuable. Regulatory policy implicitly values foreigners as equal to Americans; tort law does not. We argue that both areas of law make serious mistakes in valuing life and that each should learn from the other. Regulatory policy properly focuses on hedonic loss from death, and tort law should adopt this approach. But regulatory policy should imitate tort law's individualized approach to valuing the loss from death, including its inclusion of losses to dependents. If these changes were made, tort awards would be more uniform and predictable, and regulations would be less uniform and more stringent. In addition, average tort damages for wrongful death would be at least twice as high as they are today. With respect to dollar judgments for mortality risks, a pervasive issue is how to combine accuracy with administrability and predictability; both bodies of law could do far better on this score.

How should the legal system assign dollar values to human lives? Consider a highly publicized example.

On September 22, 2001, Congress enacted legislation to compensate the survivors of the attacks of eleven days earlier.[1] Under the final regulations,[2] survivors were permitted to claim amounts for both economic and non-economic losses. The economic losses were to be measured by calculating each victim's expected lost wages from

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[1] Air Transportation Safety and System Stabilization Act, § 405(c)1-2, 49 U.S.C § 40401 (2001).
[2] See http://www.usdoj.gov/victimcompensation/. For discussion, see Symposium, 53 DePaul L Rev 205 (2003).

September 11, 2001 through the anticipated date of retirement, subject to several adjustments, including a reduction by an estimate of household consumption or expenditure by the victim. Noneconomic losses were set at $250,000 per victim plus $100,000 per surviving spouse and for each surviving child.[3]

In all, 2,878 families, about 97 percent of those eligible, received compensation from the fund, with amounts ranging from a low of $250,000 to a high of $7.1 million; the average award totaled about $2.1 million per family.[4] Hence there was significant variability among awards. But the variability came amidst a serious effort to produce presumptive floors and caps, with a "baseline" for single decedents of $300,000[5] and a commitment to allow awards exceeding $3,000,000 only in unusual circumstances. These awards have been attacked on multiple grounds, including excessive and insufficient variability.[6]

The September 11 awards reflect a strong influence from tort law, which they simultaneously modify. But in American law, tort doctrines provide only one of two sets of rules for monetizing death. The other comes from administrative regulations, and there are striking contrasts between the two bodies of law. One of our main goals here is to bring the two in contact with one another.

Countless regulations now attempt to reduce statistical risks. Cost-benefit analysis must generally accompany these regulations, at least if their costs are high,[7] and to undertake that analysis, agencies must turn human lives into monetary equivalents.[8] For example, the Environmental Protection Agency values each life at a uniform number, most recently $6 million.[9] Through tort law, courts provide a set of fact-specific awards

[3] 28 C.F.R. § 104.44 (2004).
[4] See David W. Chen, After Weighing Value of Lives, 9/11 Fund Completes Its Task, The New York Times, June 16, 2004, at A1.
[5] 66 Fed Reg 66,274-75.
[6] See Alina Tugend, Lives in the Balance, The National Journal Government Executive, September 2003, at 50; David W. Chen, Man Behind Sept. 11 Fund Describes Effort as a Success, With Reservations, The New York Times, January 1, 2004, at B3.
[7] See Stephen Breyer et al., Administrative Law and Regulatory Policy 120-35 (5th ed. 2002).
[8] A general overview can be found in Office of Management and Budget, Regulatory Analysis, Circular A-4 (September 17, 2003), available at http://www.whitehouse.gov/omb/inforeg/regpol.html#rr
[9] See 66 Fed. Reg. at 7012. In its July 2003 regulation governing food labeling of trans fatty acids, the Food and Drug Administration used a VSL of $6.5 million, see 68 Fed. Reg. 41434, 41488 (July 11, 2003); in its March 13, 2003 proposed rule on dietary ingredients and dietary supplements, the same agency suggested a VSL of $5 million, see 68 Fed. Reg. 12158, 12229 (using this value to calculate the "value of a statistical life day").

that attempt to compensate for and to deter wrongful death. The resulting awards are highly variable. For example, courts have recently given successful plaintiffs as little as a few thousand dollars and as much as tens of millions of dollars.[10]

Notwithstanding their overlapping goals, administrative regulations and tort law diverge from one another in dramatic and puzzling ways. The most obvious difference is that tort law generally disregards the welfare loss to the person who has died; regulatory policy treats that loss as its central and indeed exclusive focus. Consider a few other differences:

- Tort law focuses directly on the loss to dependents;[11] regulatory policy pays no attention to that loss.[12]
- Tort law makes damages a function of lost income; regulatory policy disregards lost income.

Some individuation has been suggested by the interest in statistical life-years, a measure that naturally produces a higher degree of particularity. Office of Management & Budget, Circular A-4, Regulatory Analysis, at 30 (Sept. 17, 2003), available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf. More specifically, the guidelines say:

Another way that has been used to express reductions in fatality risks is to use the life expectancy method, the "value of statistical life-years (VSLY) extended." If a regulation protects individuals whose average remaining life expectancy is 40 years, a risk reduction of one fatality is expressed as "40 life-years extended." Those who favor this alternative approach emphasize that the value of a statistical life is not a single number relevant for all situations. In particular, when there are significant differences between the effect on life expectancy for the population affected by a particular health risk and the populations studied in the labor market studies, they prefer to adopt a VSLY approach to reflect those differences. You should consider providing estimates of both VSL and VSLY, while recognizing the developing state of knowledge in this area.

Longevity may be only one of a number of relevant considerations pertaining to the rule. You should keep in mind that regulations with greater numbers of life-years extended are not necessarily better than regulations with fewer numbers of life-years extended. In any event, when you present estimates based on the VSLY method, you should adopt a larger VSLY estimate for senior citizens because senior citizens face larger overall health risks from all causes and they may have accumulated savings to spend on their health and safety.

The valuation of fatality risk reduction is an evolving area in both results and methodology. Hence, you should utilize valuation methods that you consider appropriate for the regulatory circumstances. Since the literature-based VSL estimates may not be entirely appropriate for the risk being evaluated (e.g., the use of occupational risk premia to value reductions in risks from environmental hazards), you should explain your selection of estimates and any adjustments of the estimates to reflect the nature of the risk being evaluated. You should present estimates based on alternative approaches, and if you monetize mortality risk reduction, you should do so on a consistent basis to the extent feasible. Id.

[10] See below.

[11] For this and other statements about tort law, see notes below.

[12] See, e.g., Regulatory Analysis, supra note, and 66 FR 6976-01 (2001) (arsenic regulation), in support of all of the statements in this section on regulatory policy.

- Tort law uses a case-specific number to assess damages, making individual differences crucial; regulatory policy embodies a uniform number per life saved, one that fails to pay attention to individual differences.
- Tort law focuses directly on the suffering and distress felt by the decreased; regulatory policy does not attend to that issue.
- Tort law generally treats children as worth less than adults, because survivors lose less, in economic terms, when children die; regulatory policy generally treats children as equivalent to adults.[13]
- Tort law treats foreign victims of torts differently from American victims, implicitly valuing them less, because of deference to local law, unless they are killed in the United States, in which case American values are used. Insofar as regulations affect people outside of the country, regulatory policy generally ignores foreigners altogether, implicitly treating their lives as valueless.

What accounts for these differences? It is tempting to say that the answer lies in the conflicting goals of the two sets of controls. While tort law seeks to ensure compensation, especially for family members, regulatory policy is designed to produce optimal levels of risk. This point contains some truth. Tort law has long focused on the compensation of those still living—a focus that naturally leads to disregard of the deceased, an emphasis on what the plaintiffs have lost, and an interest in a set of highly individuated awards. By contrast, regulatory policy, which has assigned monetary values to statistical lives for little more than two decades, is concerned above all with producing the right deterrent signal, a concern that might seem to explain the use of a single, uniform number for the valuation of what most matters: the loss of life. But as a full account of the differences, this explanation is much too simple.[14] Tort law does and should provide deterrence as well as compensation, and if wrongful death actions produce significant underdeterrence, something is seriously amiss. In any case the catalogue of differences raises many questions about regulatory policy even if it is focused on deterrence. If the goal of administrative regulation is optimal risk levels,

[13] The recent interest in "statistical life-years" would value children more than adults; see below.
[14] We return to this question in Part V.

should regulators really use a uniform value per life saved? Should they disregard the suffering felt by dependents—and by those who die?[15]

For both bodies of law, a pervasive question is how to combine accuracy with administrability. A simple and uniform number, accompanied by blanket exclusions of values that are hard to calculate, might well be simplest to administer—and regulatory policy generally takes this approach.[16] In addition, an effort at greater accuracy might invite interest-group maneuvering; a uniform number provides a degree of insulation against special pleading. But if full compensation and optimal deterrence are the goals, then a high degree of individuation should be expected, tailoring dollar amounts to the precise circumstances of mortality risks. Suppose, for example, that both regulators and courts possessed "hedometers,"[17] costlessly able to calculate the anticipated or actual loss, to all, from every human death. If hedometers were available, courts could ensure perfectly accurate compensation, and both courts and regulators would bring about optimal deterrence, attuned to individual circumstances. If administrative costs were zero, different agencies should offer a wide range of diverse values for statistical lives, subject

[15] It would be possible to argue that both of these are picked up by figures for VSL: we explore that question below.

[16] The most explicit discussions of varying VSL have come from the EPA. In its 2003 discussion of hazardous air pollutants, see 68 Fed. Reg. 1660, 1693 (Jan. 13, 2003), the EPA noted that there "is general agreement that the value to an individual of a reduction is mortality risk can vary based on several factors, including the age of the individual, the type of risk, the level of control the individual has over the risk, the individual's attitude toward risk, and the health status of the individual." Nonetheless, the agency announced, without offering reasons, that it "prefers not to draw distinctions in the monetary value assigned to the lives saved even if they differ in age, health status, socioeconomic status, gender or other characteristic of the adult population." Id.

An extended discussion of related issues can be found in the EPA's arsenic proposal, see 65 Fed. Reg. 38888, 38945 (June 22, 2000). There the EPA noted that the "factors which may influence the estimate of economic benefits associated with avoided cancer fatalities include (1) a possible 'cancer premium' (i.e., the additional value or sum that people may be willing to pay to avoid the experiences of dread, pain and suffering, and diminished quality of life associated with cancer-related illness and ultimate fatality); (2) the willingness of people to pay more over time to avoid mortality risk as their income rises; (3) a possible premium for accepting involuntary risks as opposed to voluntary [sic] assumed risks; (4) the greater risk aversion of the general population as opposed to workers in the wage-risk valuation studies; (5) 'altruism' or the willingness of people to pay more to reduce risk in other sectors of the populationl and (6) a consideration of health status and life years remaining at the time of premature mortality." The EPA acknowledged that these factors "may significantly increase the present value estimate," but said that "there is currently neither a clear consensus among economists about how to simultaneously analyze each of these adjustments nor is there adequate empirical data to support quantitative estimates for all potentially significant adjustment factors." Id. Hence the EPA solicited comments on these issues and said that it would ask its Scientific Advisory Board (SAB) to conduct a review. Id.

[17] For those who are skeptical of utilitarian approaches, substitute the term "eudaimeters," based on the Greek notion of eudaimonia, establishing a more complex notion of well-being. See Martha Nussbaum, The Fragility of Goodness (1986).

to the limitation that regulatory programs often apply to many people at once; and courts, focusing on individual cases, would offer an even wider range of dollar awards in the event of wrongful death.

Because administrative costs are high (and also because of political constraints on inequality[18]), more uniformity is inevitable; but how much? One of the most noteworthy features of the comparative exercise is that agencies opt for uniformity, whereas courts call for a high degree of individuation. Undoubtedly this difference is partly a function of the ex post focus of wrongful death actions and the ex ante focus of regulation. But it would be most surprising if the radical difference, on this count, could be justified by that difference in perspective.

We believe that both bodies of law can learn a great deal from the other.[19] In particular, we suggest five large-scale reforms. First, agencies should move in the direction of the more individuated approach of tort law. They should not use a uniform number per life saved. In addition, they should consider pain and suffering, dread,[20] and loss to dependents. These changes would make a dramatic difference for administrative practice, replacing the crude current effort to use a single value for statistical lives. Second, courts should move in the direction of administrative regulation by taking account of the welfare loss to the decedent. This change would significantly alter wrongful death cases, by producing far higher recoveries in many cases. Third, agencies should move in the direction of courts by including the emotional distress and other welfare losses incurred by dependents; courts should not ignore losses of support for dependents (as agencies do), but they should offer more accurate and fine-grained understandings of that figure. These changes would increase the stringency of administrative regulations and promote less arbitrary figures from courts. Fourth, both courts and agencies should change their valuation of the deaths of children by taking the child's welfare loss seriously while also accounting for the possibility of offsetting

[18] See below.

[19] There is a third body of relevant law: criminal prohibitions. These prohibitions overlap, to some extent, with both tort law and administrative regulation, carving out a subset of conduct for special sanctions. By attending to enforcement levels and sanctions, it might even be possible to deduce an implicit value of life, or of statistical risks, from criminal law. Ideally, of course, legislators would ensure that all three bodies of law worked well together, producing the right deterrent signal. For present purposes, however, we put criminal law to one side.

[20] On some of the complexities here, see Matthew Adler, Fear Assessment (unpublished manuscript 2004)).

behavior by parents. Fifth, agencies and courts should evaluate mortality risks that are imposed on foreigners—both resident aliens and nonresident aliens whose mortality is affected by domestic activities—in a manner that is consistent with the diplomatic objectives of the political branches.

This Article is organized as follows. Part I provides the background from both tort law and regulatory policy. Part II discusses the theoretical basis for valuing human lives. Part III investigates a range of methodological difficulties and implications. Part IV proposes reforms to tort law and regulatory policy. Part V explores the question why tort law and regulatory policy currently take such different approaches to valuing loss of life.

I. Background

A. How Tort Law Values Loss of Life

At common law, victims (that is, their estates) and dependents could not recover damages for wrongful death. As a result, courts did not face the problem of calculating damages for loss of life. In the nineteenth century, however, many states enacted statutes that provided for recoveries. Wrongful death statutes provided that dependents, including spouses and children, may recover damages for lost support. Survival statutes provided that the victim's estate may recover damages for certain losses that the victim incurred as a result of the tort, such as medical expenses and earnings lost between injury and death.[21] Today, most states have one or both types of statutes, or statutes that combine elements of each type. In addition, there has been much judge-created common law that can be traced to these statutes. As a general proposition, one can say that courts now award damages on account of death caused by a tort, but the rules vary widely by jurisdiction. [22]

Despite the variations, there are common themes. Most courts award "non-economic" damages, that is, damages for pain and suffering incurred by the victim as a result of the tort prior to death, and also for the distress and loss of companionship

[21] 2 Dan B. Dobbs, Law of Remedies 423 (2d ed. 1993).
[22] Id., at 421-445.

suffered by dependents or heirs.[23] All states award "economic" damages. In states that use the "loss to dependents" measure, these damages are supposed to make dependents whole; roughly, they provide the support that dependents would have received if the victim had lived. This may be measured as lost contributions from victims to dependents (housing, food, and so forth), or, more crudely, future income minus victim's expenses. In states that use the "loss to estate" measure, damages are supposed to approximate the victim's estate if she had lived a natural life—total future income minus expenses.[24]

Notice that the non-economic and economic measures do not provide an award for the loss of life per se—that is, the victim's "loss of life's pleasure," also known as hedonic damages. Plaintiffs suing on behalf of a victim who has no future income, no dependents, and no spouse, and who dies without feeling pain, should ordinarily receive zero damages or damages sufficient only to cover funeral expenses.[25] This large category of people includes elderly people who are living off savings and unemployed or homeless people. It also includes homemakers, unless an implicit value is assigned to household services. And it includes children—at least in "loss to dependent" states, because children do not have dependents who lose support as a result of their death.[26]

Of course, this is a matter of formal law; in practice, damages are often awarded on account of the deaths of people who have no income, and often damages are in excess of lost income. This is partly because non-economic damages will be available in most cases, partly because juries are given a great deal of discretion to award damages in wrongful death cases and are provided little guidance by courts, and partly because courts use fictions in order to ensure a "reasonable" recovery.[27] But if all this is true, then

[23] Id. There is every reason to believe that the resulting awards have a high degree of arbitrariness. See David W. Leebron, Final Moments: Damages for Pain and Suffering Prior To Death, 64 N.Y.U. L. Rev. 256 (1989).
[24] Id., at 430-38.
[25] E.g., McGowan v. Wright, 524 So.2d 308 (Miss. 1988).
[26] In "loss to estate" states, the child's future income will be calculated, and awarded to parents or heirs. See Dobbs, supra, at 436.
[27] For example, the household services of the child – which in most households, and certainly modern middle class households, are trivial – may be given a high value. See Dobbs, supra, at 440.

damages for wrongful death are highly arbitrary,[28] and indeed this is the conventional wisdom,[29] supported by our own evidence as discussed below.[30]

Only five states permit damages for hedonic loss: Arkansas,[31] Connecticut,[32] Hawaii,[33] New Hampshire,[34] and New Mexico.[35] As a matter of theory, plaintiffs in these states can recover damages on account of the wrongful death of people who have no income and otherwise would not be entitled to non-economic damages. However, the statutes and judicial opinions in these states do not explain the methodology, and judges usually leave the calculation to the jury, with lax oversight.[36] In some cases, courts appear to misunderstand the nature of hedonic loss—for example, confusing it with lost income.[37]

The upshot is that it is exceptionally hard to predict, as a matter of formal law, what damages for wrongful death will be in any particular case. However, verdict and settlement data can be used to paint a rough picture. We examined data from two data sets: (1) an unscientific Jury Verdict and Settlement data set that provides a wealth of information about the characteristics of the cases ("JVS")[38]; and (2) a more scientific

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[28] Even aside from the legal confusion, jurors do not do a good job of monetizing losses when provided with no clear guidance to discipline their judgments. David Schkade et al., Deliberating About Dollars: The Severity Shift, 100 Colum. L. Rev. 1139 (2000).

[29] See, e.g., David Baldus, John C. MacQueen, and George Woodworth, Improving Judicial Oversight of Jury Damages Assessments: A Proposal for the Comparative Additur/Remittitur Review of Awards for Nonpecuniary Harms and Punitive Damages, 80 Iowa L. Rev. 1109 (1995).

[30] See TAN infra.

[31] See Durham v. Marberry, 2004 Ark. LEXIS 179 (interpreting ambiguous 2001 amendment to Arkansas survival statute (Ark. Code Ann. § 16-62-101(b)) as permitting recovery for hedonic loss).

[32] See Katsetos v. Nolan, 368 A.2d 172 (Conn.1976); Chase v. Fitzgerald, 45 A.2d 789 (Conn.1946).

[33] See Montalvo v. Lapez, 884 P.2d 345, 364 (Haw. 1994).

[34] See Marcotte v. Timberlane/Hampstead School District, 733 A.2d 394 (N.H. 1999).

[35] See New Mexico St. §41-2-1 (discussed in Smith v. Ingersoll-Rand Co., 214 F.3d 1235, 1245 (N.M. 2000)). Mississippi briefly allowed damages for hedonic losses in wrongful death cases, but the case that approved such damages – Choctaw Maid Farms v. Hailey, 822 So.2d 911 (2002) – was overturned by statute. See Brendan I. Koerner, What's Your Happiness Worth?, Legal Affairs, January/February 2004. Hedonic losses may also be permitted in federal civil rights cases involving wrongful death. See Sherrod v. Berry, 629 F. Supp. 195, 205 (N.D.Ill.1985), rev'd on other grounds, 856 F.2d 802 (7th Cir. 1988); Frye v. Town of Akron, 759 F. Supp. 1320, 1325-26 (N.D. Ind. 1991). However, it is not yet clear whether other circuits will follow Sherrod. See Wescott v. Crinklaw, 133 F.3d 658, 660-61 (8th Cir. 1998).

[36] See Dobbs, supra, at 445.

[37] Cohen suggests that they have not, citing Lengel v. New Haven Gas Co., 111 A.2d 547 (1955), where the court reversed an award of $60,000 because not justified by the decedent's lost income; the court did not mention hedonic loss. See Lloyd Cohen, Toward an Economic Theory of the Measurement of Damages in a Wrongful Death Action, 34 Emory L.J. 295, 307 (1985).

[38] The data are from the Jury Verdict and Settlements, Combined database in Lexis. This data set appears to have been generated from various local verdict and settlement reporting services, whose selection methods

Civil Justice System data set that contains little information about the characteristics of cases ("CJS").[39]

Table 1 provides some examples from the JVS data set; these examples are selected to show the range of real world outcomes.

Table 1: Tort Values of Life

Case	State	Year	Facts	Award[40]
Satcherwhite v. San Bernandino City Unified Sch. Dist.	CA	2002	school playground accident (11 years old)	$500,000
Romero v. West Valley Sch. Dist.	WA	2003	school bus accident (5 years old)	$1.8 million
Scurlock v. Twin Labs, Inc.	TX	2003	products liability (drug)	$2 million
Braun v. CH Franciscan Shared Laboratories, Inc.	WI	2003	medical malpractice (lab delay)	$650,000
Cook v. Newman	MO	2002	medical malpractice	$3 million
Champion v. Outlook Nashville, Inc.	TN	2002	police brutality	$4.4 million
Anonymous v. Anonymous	OH	2002	malpractice (9 months old)	$7.5 million
Brown v. LaFontaine-Rish Medical Associates	NY	2003	malpractice (anesthesia)	$365,000
Tengler v. Preferred Unlimited, Inc.	IL	1999	automobile accident	$18.2 million[41]
Solis v. Fiatallis North America, Inc.	TX	2003	worksite accident	$12 million
Smith v. Antoine	TX	2003	dram shop (9 years old)	$276,000
Huertero v. Wersching	CA	2003	police error (18 months old)	$2.1 million
Ventura v. Lipton	NY	1999	malpractice	$15 million
Davis v. Ponce	TX	2003	firefighter death in arson	$506,000
Ojeda v. Shropshire	TX	2002	malpractice	$1 million
Riley v. Giroux	FL	2003	malpractice	$750,000
Tipp v. Dow Chemical Co.	TX	2001	workplace—asbestos	$9 million
Domback v. Kubsch	WI	2004	malpractice	$198,500
Stolarz v. St. Francis Medical Center	CT	2003	malpractice	$7.8 million
Ebel v. Berkowitz	PA	2003	malpractice	$2.9 million
Egan v. Mercy Health Corp. of Southestern PA	PA	2003	malpractice	$125,000
Holmes v. Harris	DC	2003	auto accident (81 years old)	$1.75 million
Mendola v. Witkowski	NY	2002	railroad-auto accident (77 years old)	$10,000[42]

are not disclosed. Thus, it is unsafe to assume that the data are randomly generated, and indeed Lexis explicitly disclaims that they are.

[39] The data were generated by the Inter-university Consortium for Political and Social Research. Data and other information are available online at: http://webapp.icpsr.umich.edu/cocoon/NACJD-STUDY/03957.xml. The website includes information on verdicts and settlements of tort lawsuits between January and December 2001 from the 75 largest counties in the United States. These data were randomly generated.

[40] We do not include punitive damages, pain and suffering damages, medical expenses, past income, and so forth, so this category is an attempt to determine the implicit valuation of the loss of life itself. Thus, we do include (after death) losses to dependents, both economic and noneconomic.

[41] The driver was high on drugs; we suspect that in this case, as in other high award cases, the damages included a punitive element, even though not classified as such.

[42] Classified as "pecuniary costs"; it is not clear what this means.

In the JVS data set, the mean award for loss of life—meaning, usually, lost income to dependents or the estate, or mental distress to dependents (we tried to exclude punitive damages, damages for pain and suffering of the victim prior to death, medical expenses, funeral expenses, and so forth)—was $3.1 million, and the median was $1.1 million. This is roughly consistent with the findings of the CJS survey, in which the mean was about $3,759,000 and the median was $961,000 for a sample of cases from 2001.[43] Thus, the CJS survey suggests that the JVS survey may be reasonably reliable.[44] In any event, it seems clear enough that when outliers are excluded, the tort system values lost lives at well under $3 million, and about half the time under $1 million.[45] We suspect that the real amounts are somewhat lower; the evidence suggests that awards generally decline during post-verdict proceedings.[46] The considerable variance in both data sets also supports the conventional wisdom that the damage awards have a degree of arbitrariness, that is, they are not closely tied to the underlying concerns of the tort system and are also erratic and unpredictable.[47]

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[43] Thomas H. Cohen & Steven K Smith, Civil Trial Cases and Verdicts in Large Counties, 2001, Bureau of Justice Statistics Bulletin, April 2004, NCJ 202803, at p. 10.

[44] Another data set was created by Jury Verdict Research, which claims, or appears to claim, that the data set is reliable. See Current Award Trends in Personal Injury (43rd ed. 2004). Statistics for 2002 jury awards (not settlements) are: median $1.6 million; mean $4.7 million; low of $5,809 and high of $100 million. Id., at 6. Note that these awards would include such (for us) irrelevant elements as punitive damages. And see Viscusi's figures, generated from an earlier Jury Verdict Research data set, which show the same pattern. See W. Kip Viscusi, Reforming Products Liability 108-09 (1991).

[45] We should note the problem of selection effects. Parties may be more likely to settle cases that are likely to produce high awards both because of risk aversion and of the likely higher litigation costs in high stakes cases. See A. Mitchell Polinsky, Are Punitive Damages Really Insignificant, Predictable, and Rational? A Comment on Eisenberg et al., 26 J. Legal Stud. 663, 668 (1997). To be sure, verdicts and settlements data includes settlements, and the settlements are lower than the verdicts; however, this may reflect the plaintiff's risk of losing, a risk that is absent for verdicts. Still, all this means, for our purposes, is that there is a lot of unexplained variance in the cases: if some high amount, X, is the "real" level of damages for loss of life, then why are so many verdicts so much lower?

[46] See, e.g., Ivy E. Broder, Characteristics of Million Dollar Awards: Jury Verdicts and Final Disbursements, 11 Just. Sys. J. 349 (1986) (finding that plaintiffs ultimately received about 57 percent of the verdict); Neil Vidmar et al., Jury Awards for Medical Malpractice and Post-Verdict Adjustments of Those Awards, 48 DePaul L. Rev. 265 (finding reductions of about 7 to 60 percent in different jurisdictions).

[47] The standard deviation for the JVS data set is $6.1 million, with a minimum of $0 and a maximum of $50 million. We do find it difficult to believe that the data were selected because of their variance, however, so the variance may be reliable (or else it just reflects gaps and inaccuracies in the data, e.g., treating punitive damages as if they were economic loss damages). In the CJS data set, the standard deviation is $11.7 million, with a minimum of $705 and a maximum of $120 million, according to our own calculations. For analysis of product liability cases, See W. Kip Viscusi,, International Review of Law and Economics (1988); W. Kip Viscusi, J. Legal Studies (1988); W. Kip Viscusi, J. Legal Studies (1986).

Hence two points emerge from the wrongful death cases. The first is that in principle, the law calls for a highly individuated approach, one that recognizes a wide range of factors that bear on the degree of loss to dependents. The second is that in practice, actual awards on account of loss of life are usually well below $3 million and also characterized by great variance.

B. How Regulatory Policy Values Loss of Life

As we have noted, agencies now assign monetary values to human lives. The practice is recent, having become systematized only as a result of an executive order from 1981.[48] For a period, agency figures were highly and inexplicably variable.[49] With some exceptions, however, most regulatory agencies have now converged on a fairly narrow range for the valuation of life: $5 million to $6.5 million. Consider the following table, accounting for agency valuations in the recent past:

Table 2: Agency Values of Life, 1996–2003

Agency	Regulation and Date	Value of Statistical Life
Dept of Transportation/Federal Motor Carrier Safety Administration	Safety Requirements for Operators of Small Passenger-Carrying Commercial Motor Vehicles Used in Interstate Commerce August 12, 2003 68 FR 47860-01	$3 million
Dept. of Health & Human Services/FDA	Food Labeling: Trans Fatty Acids in Nutrition Labeling, Nutrient Content Claims, and Health Claims July 11, 2003 68 FR 41434-01	$6.5 million
Dept. of Agriculture Food Safety and Inspection Service	Control of 1Listeria Monocytogenes in Ready-to-Eat Meat and Poultry Products June 6, 2003 68 FR 34208-01	$4.8 million
Dept. of Health & Human Services/FDA	Labeling Requirements for Systemic Anti-bacterial Drug Products Intended for Human Use February 6, 2003 68 FR 6062-01	$5 million
Office of Management and Budget	Report to Congress on the Costs and Benefits of Federal Regulations February 3, 2003 68 FR 5492-01	$5 million

[48] See Exec. Ord. 12291, Fed. Reg. (1981). For discussion of the origins of cost-benefit balancing in federal regulation, see Richard Pildes and Cass R. Sunstein, Reinventing the Regulatory State, 62 U. Chi. L. Rev. 1 (1995).

[49] See Matthew D. Adler and Eric A. Posner, Implementing Cost-Benefit Analysis When Preferences Are Distorted, 29 J. Legal Stud. 1105 (2000)

EPA	Control of Emissions from Nonroad Large Spark-Ignition Engines, and Recreational Engines (Marine & Land-Based) November 8, 2002 67 FR 68242-01	$6 million
EPA	National Primary Drinking Water Regulations: Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring January 22, 2001 66 FR 6976-01	$6.1 million
EPA	Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements January 18, 2001 66 FR 5002-01	$6 million
EPA	Control of Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements February 10, 2000 65 FR 6698-01	$5.9 million
EPA	Findings of Significant Contribution and Rulemaking on Section 125 Petitions for Purposes of Reducing Interstate Ozone Transport January 18, 2000 65 FR 2674-01	$5.9 million
EPA	Final Standards for Hazardous Air Pollutants for Hazardous Waste Combustors September 30, 1999 64 FR 52828-01	$5.6 million
EPA	National Primary Drinking Water Regulations: Disinfectants and Disinfection Byproducts December 16, 1998 63 FR 69390-01	$5.6 million
Dept. of Transportation/FAA	Financial Responsibility Requirements for Licensed Launch Activities August 26, 1998 63 FR 45592-01	$3 million
Dept. of Health & Human Services/FDA	Quality Mammography Standards October 28, 1997 62 FR 55852-01	$2 - 3 million
Dept. of Health & Human Services/FDA	Regulations Restricting the Sale and Distribution of Cigarettes and Smokeless Tobacco to Protect Children and Adolescents August 28, 1996 61 FR 44396-01	$2.5 million
Dept. of Agriculture/Food Safety & Inspection Service	Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems July 25, 1996 61 FR 38806-01	$1.6 million

Dept. of Transportation/FAA	Aircraft Flight Simulator Use in Pilot Training, Testing and Checking and at Training Centers July 2, 1996 61 FR 34508-01	$2.7 million
Consumer Product Safety Commission	Requirements for Labeling of Retail Containers of Charcoal May 3, 1996 61 FR 19818-01	$5 million
Consumer Product Safety Commission	Large Multiple-Tube Fireworks Devices March 26, 1996 61 FR 13084-01	$3 - $7 million

What is the source of these numbers? The answer involves real-world markets, producing evidence of compensation levels for actual risks.[50] In the workplace and for consumer goods, additional safety has a price; market evidence is investigated to identify that price.[51] Agency valuations are largely a product of studies of actual workplace risks, attempting to determine how much workers are paid to assume mortality hazards.[52] The relevant risks usually are in the general range of 1/10,000 to 1/100,000.[53] The calculation of the value of a statistical life is a product of simple arithmetic. Suppose that workers must be paid $600, on average, to eliminate a risk of 1/10,000. If so, the value of a statistical life would be said to be $6 million. Additional information comes from contingent valuation studies, asking people how much they are willing to pay to reduce statistical risks of death.[54] But studies of this kind are not the foundation of agency policies in the domain of mortality risks, apparently on the theory that real-world evidence is more reliable.

Several features of agency practice are noteworthy by way of comparison to wrongful death actions. The most obvious is that agencies provide a uniform number; they make no effort to individuate, even though more individuation would not be

[50] See W. Kip Viscusi, supra.
[51] A valuable and comprehensive overview can be found in W. Kip Viscusi and Joseph E. Aldy, The Value of a Statistical Life: A Critical Review of Market Estimates Throughout the World, 27 J. Risk and Uncertainty 5 (2003).
[52] See Viscusi, Fatal Tradeoffs, supra note, for discussion.
[53] See, e.g., W. Kip Viscusi, The Value of Life: Estimates With Risks by Occupation and Industry, 42 Econ. Inquiry 29, 33 (2004) (showing fatality risks ranging from about 1/100,000 to 45/100,000).
[54] See, e.g., James Hammitt and Jin-Tau Liu, Effects of Disease Type and Latency on the Value of Mortality Risk, 28 J. Risk and Uncertainty 73 (2004); George Tolley et al., Valuing Health For Policy (1995); Valuing Environmental Preferences (Ian Bateman & K. G. Willis eds., 1999); Peter Diamond & Jerry Hausman, Contingent Valuation: Is Some Number Better Than No Number, 8 J. Econ. Persp. 45, 49-52 (1994); Note, Ask A Silly Question, 105 Harv L Rev 1981 (1992).

difficult. In addition, agencies use a higher (average) value for loss of life to the victim but place no value on losses to spouses, friends, and others who suffer a welfare loss, economic and otherwise, in the event of death. The uniform numbers, refusing to make inquiries that would lead to less uniformity or that would be difficult to administer, are not surprising in light of the comparative youth of regulatory valuation and in light of the controversial nature of imaginable distinctions. More accurate, and more complex, valuations might be expected to follow an initial period in which assignment of some number of statistical lives becomes entrenched. But these points raise the theoretical questions that bear on both judicial and administrative practice.

C. A Comparison: The September 11 Victim Compensation Fund

As we mentioned at the outset, the September 11 Fund was influenced by tort principles, and it is instructive to compare the awards to dependents of deceased victims of the September 11 attacks both with tort wrongful death awards and with agency valuations of life. Table 3 displays the comparison.

Table 3: Tort, Sept. 11 Fund, and Agency Valuations of Life

System	Mean	Median	Minimum	Maximum	Standard Deviation
Tort	$3.8 million	$961,000	$0	$50 million	$6.1 million
Sept. 11	$2.0 million	$1.7 million	$250,000	$7.1 million	$1.4 million
Agency[55]	$5. 4 million	$5.9 million	$3 million	$6.5 million	$1.0 million

Note: Tort awards from the CJS data set (2001); Sept. 11 awards from Fund Website;[56] agency valuations from Table 2 (post-2000). The Sept. 11 data are based on amounts received after deductions for life insurance payments, and the like; they therefore understate true valuations, probably by a few hundred thousand dollars.[57]

The Sept. 11 fund has a higher median but lower mean than the tort system does. The lower mean is due to the lack of extreme awards characteristic of the tort system. The higher median is probably due to two factors: (1) inflation from 2001 to 2004; and

[55] The agency statistics cannot be straightforwardly compared to the statistics for the other systems, because the former will vary depending on the relative size of the populations that the different regulations affect. Still, they give a general sense of the differences.

[56] Available at: http://www.usdoj.gov/victimcompensation/payments_deceased.html. The website provides the mean, median, and range; we calculated the standard deviation from the raw data (also provided by the website).

[57] See the examples provided at: http://www.usdoj.gov/victimcompensation/award_summaries.pdf. We have been unable to find the appropriate statistics.

(2) the much higher average income of the September 11 victims compared to that of the general population. Putting aside the outliers, then, the Sept. 11 Fund and tort awards seem largely consistent, and both are much lower than agency valuations. What the Sept. 11 Fund shares with agency valuations is the much lower degree of variance than that found in the tort system.

II. Theory: Why Should Loss of Life Be Valued?

Many people believe that a human life is uniquely precious and therefore cannot be given a monetary valuation.[58] Calculating the value of a human life demeans the victim of the wrong rather than vindicating his memory. The intuition is understandable. But for purposes of law and policy, what is the alternative? Awarding zero damages for wrongful death is hardly less demeaning, and an award of an "arbitrary" amount of money—either the jury or the legislature should pick a number out of thin air—is no better. Similarly, it is hard to believe that regulatory policy should assume that human life is worth nothing or, alternatively, that it has some arbitrary value.

To understand how loss of life should be valued, we need to understand the social purposes such a practice would advance. There is no acontextual method for assigning monetary values to mortality and mortality risks. We start with tort law, which is conventionally said to have two goals: deterrence and compensation.[59] Then we turn to regulatory policy, which shares tort law's goal of deterrence.

A. Tort Law and Deterrence

1. *Principles of Tort Damages*

The tort system has two purposes: compensation and deterrence. Frequently, but not always, the two purposes lead in similar directions. If the victim of a wrongful death action cannot be compensated, deterrence is still a possibility. The question we now investigate is what level of damages produces optimal deterrence of wrongful death. Our basic conclusion is that two approaches are formally equivalent and will accomplish that task: a monetary amount, before any harm occurs, that is the multiple of the magnitude of

[58] See Frank Ackerman and Lisa Heinzerling, Priceless: On Knowing the Price of Everything and the Value of Nothing (2004).
[59] E.g., Erny v. Estate of Merola, 792 A.2d 1208, 1217 (N.J. 2002).

the harm and its probability, assessed for every person who is made to face the relevant risk; or a monetary amount, after the harm occurs, that reflects the magnitude of the harm. The choice between the two approaches largely depends on questions of administrability.[60]

To understand how deterrence works, one must take an ex ante perspective.[61] Suppose that at time 1 the legal rules are chosen; at time 2 everyone chooses how to act and what level of care to take; and at time 3 injuries and deaths occur, and liability and damages are determined for wrongful death actions. On the deterrence approach, we want to choose legal rules at time 1 that produce damages at time 3 that give everyone optimal incentives at time 2.

As is well known, people can be given optimal incentives to take care if they are required to pay damages for any financial losses that they cause (or negligently cause).[62] Imagine, for example, that a particular behavior, such as driving, will cause $1000 in losses if an accident occurs. A driver can control the probability that the loss will occur by taking more or less care. The cost of care increases with the amount of care that is taken. The efficient level of care is the amount at which the marginal cost of care equals the expected marginal cost of an accident. By requiring the tortfeasor to pay damages, the law forces the driver to internalize the losses that she creates, and so she will take precautions when the costs of those precautions are less than the expected losses.[63]

We can think of the victim's loss in two equivalent ways. We can say that the victim incurs the cost of the accident, L, at time 3. In our example, L = $1000. This is the "ex post" loss. Alternatively, we can say that the victim incurs an expected loss of pL at

[60] There are also equitable issues here; from the equitable point of view, perhaps it is worse to compensate everyone ex ante for risks than to compensate those for harm when those harms come to fruition (insurance practices are obviously relevant to an evaluation). But our focus here is on deterrence, and we do not engage those issues.

[61] As should be apparent, we are not dealing here with intentional killings, as in cases of homicide. It is not clear that the risk of being murdered should be analyzed in the same way as the risks ordinarily involved in wrongful death cases, which typically involve negligence in one or another form. Difficult questions are raised by the evident fact that people would be willing to pay different amounts to avoid statistically identical risks: A 1/100,000 risk of a cancer death is different from a 1/100,000 risk of a sudden unanticipated death (as we stress), and a 1/100,000 risk of being strangled, or of being killed in a terrorist attack, would undoubtedly produce its own distinctive numbers.

[62] To keep things simple, we assume throughout that only the tortfeasor can control the probability of an accident. This allows us to focus on the optimal level of damages for loss of life. We also focus on optimal incentives to take care, in which case the tort rule can be either strict liability or negligence.

[63] William M. Landes and Richard A. Posner, The Economic Structure of Tort Law (1987); Steven Shavell, Economic Analysis of Accident Law (1987).

time 1, where p is the probability of the accident at time 3. This is the "ex ante" loss. From an economic perspective, these losses are equivalent. If an insurance market exists, people are assumed to be indifferent between being awarded pL, as potential victims, at time 1, and L, as actual victims, at time 3.[64] Insurers will set the premium equal to pL, and they will pay out L if the accident occurs. Tort law, in theory, could either require all drivers to pay all potential tort victims pL at time 1, or (as in fact) only drivers who cause accidents to pay only actual victims L at time 3. If the insurer is subrogated (as is usually the case), then the victim is indifferent between these two systems, as is the insurer. Potential victims who want insurance can use their "damages" of pL under the first system to pay for the insurance premium, and simply collect from the driver under the second system without going through the insurance intermediary. Potential victims who do not want insurance could purchase an investment instrument that pays pL at time 1 in return for the chance of L at time 3.[65]

Why does the tort system award damages of L to actual victims rather than damages of pL to potential victims, when the two awards are equivalent? A large part of the answer is one of practicality. Potential victims cannot be easily identified in advance, and many risks are difficult or even impossible to calculate. In the unusual cases when the reverse is true—when courts cannot award L to actual victims because the loss will occur in the distant future—some courts have been willing to force potential tortfeasors to pay potential victims damages equal to pL.[66] Thus, tort law does not, in principle, bar awards of pL rather than L; its focus on L stems from the fact that L is a far simpler foundation for judicial decisions.

2. *Valuing Loss of Life*

Now let us turn to the problem of measuring L when the loss is death. To fix intuitions, suppose that the (multiply unfortunate!) victim of the wrongful death tort has no dependents, no spouse, no friends, and no income; suppose too that the death was instant, involving no pain, suffering, dread, or medical expenses. Putting aside funeral

[64] We put to one side some complexities with this assumption.
[65] Cf. Robert Cooter and Ariel Porat, Anti-Insurance, 31 J. Legal Stud. 203 (2002).
[66] See Matthew D. Adler, Risk, Death and Harm: The Normative Foundations of Risk Regulation, U. Minn. L. Rev. 1419-21 (forthcoming 2004) and citations therein (discussing tort cases that recognize torts for increasing the risk of death).

expenses, most courts would be required by law to award zero damages, which is a serious puzzle.

How should we think about valuing the loss of life? One thought is that the loss of life should be valued at infinity because most people would not accept any amount of money in exchange for their lives. If L—the loss—is infinite, then the product pL is infinite as well. But this answer mistakes the relevant inquiry, which involves probabilities of death, not death itself. Designate a new variable R, which refers to the amount a person is willing to pay to avoid a particular risk of death. When a new risk is created—say, a new kind of manufacturing process creates new sources of pollution, producing a new risk of 1/500,000 in the area—everyone who incurs this risk suffers a loss of welfare, which can be measured as R. If the person can pay to avoid this risk—say, by moving—then he will pay any amount of money up to R. R is thus the ex ante payment to avoid the risk of death.

It is desirable for potential tortfeasors to take account of this loss, R, for the same reason that it is desirable for them to take account of any other pecuniary or nonpecuniary loss.[67] This can be done in two ways. All potential tortfeasors can be required to pay R to every potential victim (that is, all people who incur the new risk of death). Alternatively, tortfeasors who actually cause the death of particular victims can be forced to pay an amount of money only to those victims (their estates or dependents, or even to the state) such that the expected cost for the potential tortfeasor is R.[68] Assuming sufficient information, that amount is easily calculated. If victims are willing to pay R in order to avoid the risk, and the risk itself—that is, the probability of death, is q—then the proper level of damages is R/q. For example, if potential victims are willing to pay $600 in order to avoid the risk of death, and the risk of death is 1/10,000, then their estates or

[67] We are not discussing the optimal liability rule; simply assume that such a rule is in place.

[68] One or both methods have been discussed by various commentators. Ted R. Miller, Willingness to Pay Comes of Age: Will the System Survive, 83 Northwestern U.L. Rev. 876 (1989); Andrew Jay McClurg, It's a Wonderful Life: The Case for Hedonic Damages in Wrongful Death Cases, 66 Notre Dame L. Rev. 57 (1990); Landes and Posner, supra, at 187-89, 263-69; Shavell, supra, at 234 & n.7; Cohen, supra, at 316-20; Erin A. O'Hara, Hedonic Damages For Wrongful Death: Are Tortfeasors Getting Away With Murder?, 78 Geo. L.J. 1687 (1990); Mark Geistfeld, Negligence, Compensation, and the Coherence of Tort Law , 91 Geo. L.J. 585 (2003). Arlen criticizes these methodologies, claiming that they require too much information. See Jennifer Arlen, An Economic Analysis of Tort Damages for Wrongful Death, 60 N.Y.U. L. Rev. 1113 (1985). Many articles defending the methodology, discussing aspects of it, or criticizing it are collected in The New Hedonics Primer for Economists and Attorneys (John O. Ward and Thomas R. Ireland eds., 2d ed. 1996).

dependents should recover $6 million (at time 3). This is equivalent from the deterrence perspective to the first alternative, that of forcing tortfeasors to pay all potential victims $600 (at time 1).

The amount R/q—$6 million, in our example—is often called the value of a statistical life (VSL), but it is important to see that the number is just a construct, designed to represent the cost of being subject to the *risk* of death, and not the value of human life in the ordinary sense. In fact the term "value of a statistical life," though in common use,[69] is actually quite misleading. What is really involved is the assignment of monetary values to death *risks*—an assignment of the sort that occurs, though almost always without formal calculation, whenever people run risks or take steps to reduce the risks that they face (as, for example, by purchasing smoke alarms or Volvos).

The point to understand is that in order to calculate optimal damages for wrongful death, we do not need to ask how much welfare or utility a dead person has, or how much welfare or utility declines when a person dies. From a deterrence perspective, it is sufficient to focus on the decline in welfare that results when a person is subjected to the risk of death. The assignment of a monetary value to mortality risks is an effort to ensure that focus.

B. Tort Law and Compensation

In tort cases involving easily measured losses, the deterrence and compensation goals are joined in an intuitively satisfying way. The tort victim who loses $1000 obtains damages of $1000. The tort victim is fully compensated, and optimal deterrence is achieved.[70] In wrongful death cases, however, there appears to be a disjunction between the compensation and the deterrence goals. The dead person cannot be compensated—she is dead. Because of the compensatory focus of tort law, this may be the reason that courts denied damages for wrongful death prior to the enactment of wrongful death and survival statutes. Hence courts attempt to achieve the compensatory goals of modern tort law by focusing on the losses of survivors. We think that the attempt is inadequate and that courts can do much better.

[69] See, e.g., Viscusi and Aldy, supra.

[70] Albeit only in simplified setting where the victim has no ability to reduce the probability of an accident by taking care.

Although dead people cannot be compensated, it is incorrect to say that tort law cannot, with respect to victims, achieve its compensation goal in the wrongful death context. Compensation is possible in such cases once it is understood that the tort involves imposition of the risk of death.[71]

To see why, imagine that courts adopted the alternative ex ante system of liability: all potential tortfeasors pay damages equal to R to all potential victims in time 1. If this were the normal system, then people would be compensated for being forced to undergo heightened risks of death. They would be compensated in the same sense as workers who are given hazard pay in return for voluntarily undertaking some risky task.[72]

Now consider the regular ex post system. By awarding the victim's estate R/q, the court does not compensate the victim in a straightforward sense: you cannot compensate someone who is dead. But suppose that the victim has a life insurance policy, which provides that the insurer is subrogated to any claims that the victim's estate has in case of wrongful death. In addition to getting the regular benefits of a life insurance policy, all potential victims who have life insurance would receive R in the form of the reduction in the life insurance premium. Because the insurer has the right to R/q in case of a wrongful death, it will be able to pass on the cost reduction in the form of a certain premium reduction. In short, the risky behavior imposes a cost of R on all potential victims at time 1, but at the same time all potential victims are compensated via the intermediation of an insurance company at time 1.[73] Thus, tort law *can* serve its compensatory function in wrongful death cases, albeit in an indirect way and only with the help of a market intermediary.[74]

To be sure, this is not what people usually mean by compensation in tort cases. The usual notion is that if one person commits a wrongful act that injures another person,

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[71] We assume that there is no hedonic loss, such as dread, associated with the risk. If there is, then additional compensation may be necessary. See Adler, supra.

[72] See W. Kip Viscusi, Risk by Choice (1983).

[73] Cf. Cohen, supra, at 338 (discussing a market in wrongful death actions).

[74] A related literature discusses whether tort law should award damages for nonpecuniary losses such as pain and suffering. Shavell argues that compensation for pain and suffering damages serves no insurance purpose, because there is no reason to believe that the marginal value of a dollar for a person is higher when he endures pain and suffering than when he does not. See Shavell, supra, at 228. For a contrasting view, see Steven P. Croley and Jon D. Hanson, The Nonpecuniary Costs Of Accidents: Pain-And-Suffering Damages In Tort Law, 108 Harv. L. Rev. 1785 (1995). In the case of death, the victim himself cannot be insured against his own death in the sense of being made indifferent between life and death; life insurance payouts are to dependents, not insureds.

the wrongdoer should compensate the victim for the loss. This principle yields straightforward legal results in ordinary cases. If the tortfeasor destroys the victim's automobile, then damages should equal the value of the automobile or the cost of replacing it. Such damages would make the victim whole. However, damages cannot compensate the victim of a wrongful death tort because the money has no value for a person who is dead. On this view, courts' refusal to award damages for loss of life is, from a strictly compensatory perspective, correct.

To avoid this odd result, some scholars have suggested that a risk of death is a harm; in their view, people should have a claim for tort damages if they are subjected to risks of death.[75] Others have expressed doubts about whether a risk can be a harm,[76] but if this debate is resolved in favor of the risk-is-harm view, then we are back to our earlier claim: it is proper to award damages of R in case of risk imposition. We add only that compensation can take the form of R/q in the case of death at time 3, as well as R for all potential victims at time 1, as long as potential victims purchase insurance and insurance premia adjust.

C. Regulatory Policy

1. *Agencies and Deterrence*.

With respect to valuing the loss of life, the implications of our deterrence argument is the same for regulatory law as for tort law. In order to provide optimal deterrence of behavior that cause a risk of death, the individual or firm that engages in this behavior should internalize R, so long as we are not concerned with the potentially negligent conduct of victims.[77]

As we have seen, tort principles suggest that the people who impose risks on others should either pay R to all affected persons at time 1, or R/q to all actual victims at time 3. As we noted above, nothing about deterrence theory requires that the payments go to the potential victims or the estates or dependents of victims. For deterrence purposes, payments could even go to the government. All that is important is that people know that

[75] See Christopher H. Schroeder, Corrective Justice and Liability for Increasing Risks, 37 UCLA L. Rev. 439 (1990).
[76] See, e.g., Adler, supra; Matthew D. Adler, Against "Individual Risk": A Sympathetic Critique of Risk Assessment (unpublished m.s. 2004); Claire Finkelstein, Is Risk a Harm?, 151 U. Pa. L. Rev. 963 (2003); Ariel Porat and Alex Stein, Tort Liability Under Uncertainty 101-115 (2001).
[77] For the sake of simplicity we are bracketing that issue.

they will have to pay for imposing risks on other people, and will have to pay an amount equal to the victims' willingness to pay to avoid the risk.[78] Payment to victims, potential victims, dependents, and estates may provide other kinds of incentives, such as the incentive to bring lawsuits, and these incentives might be valuable, but they should be kept separate at the theoretical level.

Federal regulations do not require firms to pay damages to people who are killed as a result of their behavior. Instead, regulatory agencies direct firms to take precautions that (in theory) are the precautions that the firms would take if they were subject to (optimal) tort liability. If the firms fail to take these precautions, they are fined or punished in some other way. To determine the optimal level of precautions, agencies must perform on their own the calculations that tort law leaves to the potential tortfeasor. Thus, when firms impose risks of death on people, agencies must value those risks, just as in tort law. The analysis is the same as in tort theory. If a firm's behavior increases the risk of death by q, and people are willing to pay R to avoid that risk, then the firm should be ordered to take precautions such that the joint costs of precautions and expected losses are minimized. For example, if the firm's activities impose a 1/10,000 risk on 1 million people, and the cost of incurring the risk is $500 per person, then the firm is implicitly causing harm of $500 million. One can conceptualize this equivalently as causing $500 of harm to 1 million people or $5 million of harm to 100 people, those who actually die as a result of the behavior. The regulatory agency uses these figures in a cost-benefit analysis: if these costs are greater than the benefits from the firm's activities, then the agency will issue regulations that restrict the behavior of the firm and similar firms. In the regulatory context, this is in fact the standard theory of valuation of statistical lives[79] (what we prefer to call valuation of statistical mortality risks).

Tort law and regulatory law, then, require decisionmakers to attach a value to R, the amount of money a person will pay to avoid a risk of death. But R is not the only loss

[78] Or under negligence law, only if they do not take the cost-justified precautions. We also bracket the question whether the legal system should use willingness to pay or willingness to accept. On the difference, see Daniel Kahneman, Jack L. Knetsch, & Richard H. Thaler, Experimental Tests of the Endowment Effect and the Coase Theorem, 98 J. Pol. Econ. 1325 (1990).

[79] See, e.g., W. Kip Viscusi, Fatal Tradeoffs (1994); EPA, Guidelines for Preparing Economic Analyses (2000); Circular C-4, supra note.

that is imposed when a person dies. We have briefly described the general approach to the valuation of R; Part III goes into more detail.

2. *Coordinating Judicial and Agency Behavior.*

According to standard wisdom in law and economics, tort law and regulatory law have redundant functions: both deter cost-unjustified behavior. Reliance on one rather than the other should depend on their special investigation and enforcement advantages.[80] In the regulatory context, a significant disadvantage is that agencies need a great deal of information, on both the cost and the benefit side, to produce optimal regulations. By contrast, damage rules for torts require courts to assess costs alone. If the two systems overlap—if, as is often the case, they govern the same behavior—they may interact in complex ways. If both systems are optimal, and as a result people would take appropriate care if either were in place, the regulatory system will generate unnecessary administrative costs and possibly excessive deterrence. Suppose, for example, that the rules of tort liability and damages imposed the proper incentives; if so, there would be no need for regulations, which could introduce distortions. Regulations are necessary largely because many of those who are harmed by private conduct are unlikely to bring suit and to receive compensation. In the context of air pollution, for example, chains of causation are exceedingly difficult to trace, and those who fall prey to life-threatening or fatal diseases are unlikely to know that pollution is responsible. Because of collective action problems and informational deficits, tort law will not provide adequate incentives even if it is optimally tailored.

We can clarify the problem by imagining the existence of a single agency, say the Federal Compensation and Deterrence Agency (FCDA), with the task of ensuring optimal deterrence and of compensating those who deserve it. Such an agency would avoid the redundancy that is a possible outcome of parallel systems of tort law and agency regulation. It would also see compensation as part of the provision of appropriate incentives. If federal agencies acted like the FCDA, compensation would not be necessary via the tort system. And if courts acted like the FCDA, compensating people while creating proper incentives, there would be no need for agency regulations.

[80] For example, agencies can better deter behavior that produces harm with long latency periods. See Shavell, supra, at 277-86.

So long as the two systems are in place, they should be designed so as to be complementary—a task that has yet to be attempted and that we will not explore here. In the real world, the existence of two systems is likely to be harmless, at least most of the time. People who take cost-justified precautions avoid fines (from regulatory agencies) and damage payments (from tort victims); people who take suboptimal precautions risk both. In theory, then, people whose behavior is regulated by both systems will not be overdeterred.[81] If one system is optimal and the other is suboptimal, however, it is important that the suboptimal system yield to the other; regulatory preemption may accomplish this task when regulations impose the proper level of care and when tort liability would distort incentives. [82]

A more interesting difficulty arises when two activities that are partial (or full) substitutes are regulated by different systems that rely on different valuations. Consider, for example, automobile travel, which is mainly but not entirely regulated by the tort system (regulations affect the design of cars and highways, too) and short-haul air travel, which is mainly but not entirely regulated by agencies (tort law also matters, of course). Suppose that agencies and tort law use reasonable but different life valuations. This may distort incentives and cause people to substitute from driving to flying or vice versa. To see why, focus on the valuation of lives of third parties (on the ground victims of air crashes, pedestrians). If tort law values victims less than regulatory law, then—all else equal—driving will be cheaper than flying. So some people who would otherwise prefer to fly will drive instead. Even though both tort law and the agencies use valuations that are within the reasonable range, it would be better if they both use the *same* valuation than if they use different valuations, even if one must arbitrarily pick one number from the range.

[81] In simple models, tort damages for negligence can be arbitrarily higher than the actual loss, and optimal deterrence will still be obtained; however, this result does not necessarily hold in more complex models, where damages may provide victims perverse incentives to engage in contributory negligence or otherwise expose themselves to the regulated activity "too much." But even if there is an optimal level of damages, the government can set the fines for regulatory violations such that the expected tort damages plus fines equal the optimal level.

[82] See, e.g., Alan Schwartz, Proposals for Products Liability Reform: A Theoretical Synthesis, 97 Yale L.J. 353, 388-92 (1988) (arguing that compliance with regulations should immunize firms from product liability).

This point suggests that it would be valuable for the federal government to create an agency or commission that determines focal or recommended valuations, and urges courts to adopt them, taking advantage of the willingness of courts to allow themselves to be influenced by agency judgments in other contexts. Consider, for example, a Federal Loss Valuation Commission, one that would set forth guidelines for determining the value of loss of life, loss of spouse, grief, and so forth, for use by courts in tort cases and by regulatory agencies in their cost-benefit analyses. The guidelines might or might not be purely advisory, but in any event they would tend to bring about a greater uniformity and also stimulate more systematic thinking about valuation of losses. But investigation of this possibility would take us well beyond our central concerns here.

III. What Is the Value of the Loss of Life?

A. General Issues

We have seen that agency practices grow out of real-world evidence involving labor markets. In principle, this is a reasonable start under the framework we are elaborating. Regulators are attempting to produce the optimal level of deterrence by reference to actual market valuation of statistical risks. Nonetheless, serious questions might be raised about the use of these studies by EPA and other agencies.

1. *Uniform Numbers or Variable Numbers*

The underlying studies of market behavior show significant variety in the crucial figures, ranging from $0.7 million, in 1997 dollars, to $16.3 million.[83] Recently OMB stressed that a "substantial majority of the resulting estimates of VSL vary from roughly $1 million to $10 million per statistical life."[84] The EPA has adopted the $6.1 million figure on the ground that it represents the median in the relevant studies.[85] But there is a risk of arbitrariness in fastening on that median figure, certainly if we lack reason to believe that the relevant study is the most accurate. In fact a more general look at the VSL data produces further puzzles and wider ranges. Some studies find no compensating

[83] See EPA, Guidelines for Preparing Economic Analyses 89 (2000). For a detailed outline and discussion, see Richard W. Parker, Grading the Government, 70 U Chi L Rev 1345, 1485-86 (2003).
[84] Circular A-4, supra, at 30.
[85] Id.

differentials at all, indicating a VSL of zero[86]—implausibly low, to say the least, for purposes of policy. Others find that non-unionized workers receive negative compensating differentials for risk, that is, they appear to be paid less because they face mortality risks.[87] Another study finds that African-Americans receive no significant compensating wage differential and hence that their particular VSL is zero.[88] On the other hand, it is possible to find studies finding a VSL not below the range in Table 2 but above it; consider the finding that for people who choose jobs with low level risks, the VSL is as much as $22 million.[89] The most recent meta-study, far more comprehensive than EPA's own analysis, finds that most studies produce a range of between $3.8 million and $9 million.[90] An obvious issue is the grounds for these nontrivial differences.

2. *Worker Ignorance*

A different objection would point to worker ignorance. Perhaps workers are unaware of the risks that they are running. If so, the labor market studies do not really show how workers are trading off risks for money, and hence they are essentially useless. This objection cannot be simply dismissed. But current agency practice depends on the judgment that the numerous studies of risk premiums indicate that sufficient numbers of workers are informed to establish a "price" for additional increments of safety.[91] If that judgment is incorrect, then the current numbers need to be rethought, on the ground that labor markets do not show informed tradeoffs between money and statistical risks. Under the current theory, the regulators' task would be to use other tools, perhaps contingent valuation studies, to establish those tradeoffs.

3. *Worker Coercion*

Do workers voluntarily trade risks for dollars? An obvious objection would be that many of the relevant workers have few options, and hence their market behavior—trading off a risk of 1/10,000, say, for an apparently low sum—is in an important sense involuntary.[92] If taken as a normative claim about voluntariness, the claim may be right:

[86] See Peter Dorman and P. Hagstrom, Wage Compensation for Dangerous Work Revisited, 52 Industrial and Labor Relations Rev. 116 (1998).
[87] Viscusi and Aldy, supra note, at 44.
[88] Leeth and Ruser, supra note.
[89] Viscusi and Aldy, supra note, at 23.
[90] See id., at 18.
[91] See W. Kip Viscusi, supra note; Viscusi and Aldy.
[92] See Frank Ackerman and Lisa Heinzerling, Priceless (2003).

When people have few or bad options, their choices might not count as voluntary. But if taken as an objection to VSL studies, the claim is less helpful. Under the theory that we have outlined, the question is how much people are willing to pay to eliminate specified risks. Of course people are willing to pay less, for risk reduction, if they have less to pay. Note also that the VSL numbers for workers are not radically different from the corresponding numbers generated by purchases of cars, housing, and so forth[93]—a fact that weakens the suggestion that coercion lies behind the employment figures.

In any case government does workers no favors by requiring them to "buy" more health protection than they want. Suppose, for example, that workers are generally willing to accept $600 to run a risk of 1/10,000. If an agency bans that deal, and forbids workers from running that risk at that price, it will not improve workers' welfare. This is simply a specific example of the general proposition that when people's circumstances lead them to make harsh deals, they are usually not helped when government blocks those deals. Of course the analysis would be different when those who receive the benefits of regulation do not also pay for it.[94]

4. *Uniformity and Individuation*

Agency regulations use a single value for a statistical life, but a moment's reflection should be enough to show that by the very theory that agencies now use, this is a blunder.[95] There are several problems here.

First, people will almost certainly show a large difference in the dollar value of statistically identical mortality risks.[96] Would people really show the same VSL for 1/100,000 risks of deaths from lung cancer, car crashes, plane crashes, strokes, and Alzheimer's disease? An affirmative answer would be extremely surprising, and a great deal of evidence suggests otherwise. The American economy contains a wide range of occupations and industries, and a uniform VSL should not be expected to emerge from

[93] See W. Kip Viscusi, supra note; Viscusi and Aldy, supra note.
[94] This complication is discussed in Cass R. Sunstein, Valuing Life: A Plea for Disaggregation, Duke LJ (forthcoming 2004). Compare Circular A-4, supra note, at 30 (rejecting adjustments in VSL "to reflect the specific rule context").
[95] See id.
[96] See Richard L. Revesz, Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives, 99 Colum. L. Rev. 941, 962–74 (1999). For evidence, see James Hammitt and Jin-Tau Liu, Effects of Disease Type and Latency on the Value of Mortality Risk, 28 J Risk and Uncertainty 73 (2004).

each of them. Indeed, a recent study finds significant differences across both occupations and industries,[97] with blue collar workers showing a higher VSL than others.[98]

It is inevitable that a wide range of values would emerge from studies that looked separately at machine operators, executive positions, sales, dental technicians, equipment cleaners, security guards, and secretaries[99]—and undoubtedly diverse values could be found within each category. In addition, many risks controlled by the EPA are qualitatively different from the workplace risks that EPA has used to generate its VSL. There is considerable evidence that the risks associated with cancer produce a higher WTP than other kinds of risk.[100] For example, Hammit and Liu find that in Taiwan, willingness to pay to eliminate a cancer risk is about one-third larger than WTP to avoid a risk of a similar, chronic degenerative disease.[101] The "cancer premium" might be produced by the "dread" nature of cancer; it seems well-established that dreaded risks produce special social concern, holding the statistical risk constant.[102]

Second, both individuals and groups should be expected to show significant differences in their VSL. This is partly because they are risk-averse or risk-inclined, and partly because of differences in terms of both wealth and income. Continuing national income growth means that studies from the 1970s, on which agencies now rely, understate VSL. [103] Equally important, risk reduction programs that are aimed at wealthy populations should, under the prevailing theory, produce a higher VSL than similar programs aimed at poor populations. Those who have a great deal of resources will naturally show a higher VSL than those with little. According to the theory that now

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[97] W. Kip Viscusi, The Value of Life: Estimates With Risks by Occupation and Industry, 42 Ec. Inquiry 29, 39-41 (2004)

[98] Id.

[99] See id. at 33. Viscusi does not produce separate numbers for the different occupation groups, but his data clearly indicate that separate numbers would emerge.

[100] See Richard L. Revesz, Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives, 99 Colum. L. Rev. 941, 962–74 (1999).

[101] See Hammitt and Liu, supra note.

[102] See Paul Slovic, The Perception of Risk (2000).

[103]See Dora L. Costa & Matthew E. Kahn, The Rising Price of Nonmarket Goods, 93 Am. Econ. Rev. (Papers & Proc.) 227, 229 tbl.1 (2003) (suggesting likely current value of $12 million). For recent evidence that the current numbers are indeed too low, see W. Kip Viscusi, Racial Differences in Labor Market Values of a Statistical Life, 27 J. Risk & Uncertainty 239, 252 tbl.5 (2003) [hereinafter Viscusi, Racial Differences], finding values as high as $15.1 million in the case of white males. In the context of arsenic regulation, the EPA also noted in its sensitivity analysis that the appropriate adjustment would increase the VSL from $6.1 million to $6.7 million. 66 Fed. Reg. at 7012. For recent evidence, suggesting that the current VSL is $4.7 for a full sample, $7 million for blue-collar males, and $8.5 for blue-collar females. See W. Kip Viscusi, The Value of Life: Estimates With Risks by Occupation and Industry, 42 Ec. Inquiry 29 (2004).

animates regulatory practice, agencies should use a VSL that corresponds to the actual number for the population at stake.

This point has numerous implications. The workplace studies on which agencies currently rely involve people with income that is below the population-wide median; to that extent, the numbers are too low as applied to a population that is more representative of the nation as a whole. Agency distinctions between wealthy and poor populations would undoubtedly be quite controversial, but they are required by the very theory that agencies currently use. Less controversially, recent evidence suggests that older people show a lower VSL than younger people,[104] and that distinction might well be incorporated into regulatory policy.

The general conclusion is that use of WTP has a plausible logic to it, that variable numbers make far more sense than uniform ones, and that the real question involve information and administrability. Regulatory programs often affect thousands or even millions of people at the same time, and full individuation is therefore impossible. A rule that calls for minimum levels of air quality cannot provide air quality that is perfectly calibrated to each person's WTP. Nonetheless, agencies could certainly move in the direction of greater individuation. So long as the WTP figures are accurate, government does well to begin with them. Exactly the same is true for courts in wrongful death actions.

B. Dependents

Tort law generally awards dependents the portion of the victim's future income that would have supported those dependents if the victim had lived a normal life, plus sometimes an amount for grief, distress, and loss of companionship.[105] Regulatory policy usually ignores the loss to dependents.[106] What is the proper treatment?

An act that kills a breadwinner harms dependents in two ways. First, the dependants feel grief or emotional distress. Second, the dependents are deprived of support—a source of income. It is possible, of course, that people's WTP incorporates both of these harms—that when a worker, for example, is WTP $60 to eliminate a risk of

[104] Joseph P. Aldy and W. Kip Viscusi, Age Variations in Workers' Value of a Statistical Life (2003), forthcoming.
[105] See Dobbs, supra, at 430-34.
[106] Our searches of the Federal Register database have disclosed no regulatory impact analyses that attempt to monetize losses to dependents resulting from the deaths of breadwinners.

1/100,000, a portion of that figure reflects the worker's desire to reduce the losses of those who depend on him. For this to be so, however, workers would have to be pure altruists as well as aware of the universe of losses, and we believe that it would be heroic to assume that the WTP figures fully incorporate those losses. The extent to which they do so is an empirical question on which information is absent. Grief and lost income raise quite different issues, and so we discuss them separately.

1. *Grief*

When a person dies, his dependents such as his spouse and children are likely to feel grief. Grief is a welfare loss, and potential tortfeasors should take this loss into account as well as more conventional losses. Although grief will be felt by many nondependents as well, including friends and adult children, and grief felt by these people are welfare losses as well, we will confine our attention to dependents, for whom the emotional distress is likely to be particularly acute.

One reason for excluding grief is the difficulty of monetizing it. How can the WTP for grief be determined? The very question might seem absurd. Although it is easy to imagine contingent value questions that ask, "How much are you willing to pay today so that you would not feel grief if a loved one died at some time in the future?", we suspect that people would have difficulty answering this question. Even though people see grief as a welfare loss, and all things equal would prefer to avoid it, they might think that they *ought* to feel grief if a loved one dies, and in any case they would find it exceptionally difficult or even impossible to monetize the value of not feeling grief. Other contingent valuation questions seem more promising. For example, people might be asked, "How much are you willing to pay to avoid having your spouse be subjected to a risk of 1/50,000?" This question, whose answer should incorporate anticipated grief, is not fundamentally different from others that are taken seriously in the context of regulatory policy.[107] But contingent valuation studies generally face serious questions of

[107] See Ian J. Bateman and Kenneth G. Willis, eds, Valuing Environmental Preferences (Oxford 1999); Cass R. Sunstein, The Arithmetic of Arsenic, 90 Georgetown L. J. 2,255 (2002) (discussing contingent valuation study involving nonfatal cancer).

reliability,[108] and the valuation of risks faced by loved ones faces those questions in unusually acute form.

A better approach might be to find proxies. Consider, for example, the problem of valuing the grief felt from the death of a spouse. Studies show that married people are happier than unmarried people, and that part of this happiness is in part a result of emotional closeness and companionship.[109] Although the work is not at an advanced stage, it suggests that the difference between the happiness of a married person and a widowed person can be quantified using simple scales based on subjective assessments of one's emotional well-being.[110] To derive a WTP to avoid grief from a spouse's death, one would need to (1) determine the average length of time that the grief persists (for example, until remarriage); (2) find an equivalent happiness difference in an area of life that has been reliably monetized (for example, WTP to avoid disease or depression), and convert this difference into annual units; (3) multiply (1) and (2).

A very crude estimate can be made from a recent study. This study shows that a person who is married has the level of self-reported happiness equivalent to that felt by a widowed person who receives an extra $100,000 per year (in 1990 dollars) but is otherwise equivalent.[111] If the average number of years before remarriage or the "natural" termination of the original marriage (from divorce, or normal mortality) is, say, 5 years, then the welfare loss is equivalent to about $500,000 (or closer to $400,000 with discounting). We emphasize that this figure is meant for illustrative purposes, both because the methodology is different from the standard VSL methodology and because the methodology is very new and at an early stage of testing and development. In addition, the study does not quite capture grief; if it captures anything, it is the monetary

[108] See Richard B. Stewart, Liability for Natural Resource Injury: Beyond Tort, in Analyzing Superfund: Economics, Science, and Law 219, 234-37 (Richard L. Revesz & Richard B. Stewart eds., 1995); Symposium, Contingent Valuation, 8 J. Econ. Persp. 3 (1994).

[109] See Ed Diener et al., Similarity of the Relations Between Marital Status and Subjective Well-Being Across Cultures, 31 J. Cross-Cultural Psych. 419 (2000); Michael Argyle, Causes and Correlates of Happiness, in Well-Being: The Foundations of Hedonic Psychology 359-62 (Daniel Kahneman et al. eds. 1999).

[110] See Bruno S. Frey and Alois Stutzer, Happiness and Economics 57-58, 62-63 (2002).

[111] The study essentially finds correlations between self-reported happiness, on the one hand, and various life events, wealth, and so forth, on the others. See Andrew J. Oswald and David Blanchflower, Well-Being Over Time in Britain and the USA, 88 J. Pub. Econ. 1359 (2004); see also Andrew E. Clark and Andrew J. Oswald, A Simple Statistical Method for Measuring How Life Events affect Happiness, 31 Intern'l J. Epidemiology 1139 (2002).

equivalent of the welfare reduction from not having a spouse (a number that may be larger or smaller than grief because of the wrongful death of a spouse). Still, the study shows that the amounts under consideration are not trivial, and indeed will be much higher when the decedent has multiple dependents—children as well as a spouse.

Whatever the flaws of this method, it is likely to be superior to the current alternatives. Regulatory law implicitly treats this WTP as equal to zero, which cannot be right. Tort law leaves this question to the jury, which, without any guidance, is likely to produce amounts that are unreliable, unpredictable, or both. Jurors must engage in a difficult enterprise of translating grief into monetary equivalents and in any case rely on their lay judgments, which studies suggest are systematically incorrect. For example, people tend to think that victims of traumas never fully recover their sense of well-being, when in fact the grief or mental distress that results form such traumas usually dissipates after a few years.[112] We conclude that some amount for grief should be included in both jury awards and regulatory assessments of the loss associated with mortality risks. Any particular number has a degree of arbitrariness, but on the basis of current evidence, $500,000 would not be the worst place to start.

2. *Lost Support*

When a person dies, dependents are deprived of the portion of the victim's income and resources that were used for their benefit. It is tempting to think that the monetized welfare loss—the dependent's WTP to avoid loss of support—is equivalent to the lost support, but this is not likely to be true.

To see why, imagine a two person household consisting of H and W. W is the breadwinner, and H takes care of the house. W makes $50,000 per year. Suddenly, W is killed. What amount of money is necessary to compensate H for the loss of support?

The answer is *not* $50,000 per year (that is, a lump sum of something like $1 million). It is quite possible that many people in the position of H will now get a job that earns, say, $30,000 per year. Most Hs are not likely to be better off than they were before from a purely financial perspective, but it would be wrong to say that they are $50,000 worse off. The new one-person household receives only $20,000 less per year, and H

[112] See Brickman, Coates, and Janoff-Bulman, Lottery Winners and Accident Victims: Is Happiness Relative?, 37 J. Personality & Soc. Psych. 917 (1978).

does not share his income with W. H must work now, and perhaps he must pay someone to clean the house, but he also does not have to perform household services that partly benefit W, as he did before W's death.

Even if H cannot work (suppose he is disabled), the right answer is probably not $50,000. For one thing, W may devote only a small portion of her income to the support of H. Perhaps she spends $40,000 for herself, and only $10,000 for him. On the other side, W may invest significant uncompensated work into supporting H: for example, she cooks for him. The former consideration suggests that $50,000 is too high, the latter consideration that $50,000 is too low.

We can even imagine extreme situations, where the dependent is made better off (financially) by the breadwinner's death. Suppose that a parent neglects his children, and gives them inadequate food and clothing. The parent dies and the children are moved to the home of relatives or to a foster home, where they receive adequate food and clothing. From the perspective of financial support (but not necessarily emotional well being), the children are better off, not worse off; the loss of support caused by the death is zero. These examples suggest that a high degree of individuation is appropriate for judgments about loss of support; no uniform number could possibly make sense. For regulators, dealing with populations rather than individuals, it would be necessary to assess the population-wide mean for the relevant beneficiaries.

How should loss of support be calculated? Consider first the death of a spouse in a family that has no children. As a matter of theory, a sensible approach would be to determine the economies of scale from household production.[113] Consider two people who have separate households; let their annual joint costs be C. Now the two people set up a single household; their annual joint costs drop to C' because one kitchen is cheaper than two, and so forth. As a first approximation, ½(C–C') would be the annual (financial) cost to one person from the death of the other. If on average, it takes a person X years to set up a new household after the death of a spouse, then the financial cost is ½X(C–C').

[113] See Gary S. Becker, A Treatise on the Family (30-53) (1991) (analyzing the division of labor within households).

This figure can be derived from existing studies that look at the financial cost of divorce.[114]

When children exist, the calculations are more complex. If one of two parents dies, then the children are deprived of the victim's investment in childcare. This amount can be roughly monetized by using market data for the cost of nannies and the like. If a single parent dies, or both parents die, the children must be moved to a new family. Foster parents receive a subsidy from the state; this is a first approximation of the financial burden, and ought to be borne by the tortfeasor or regulated entity. Friends or relatives who take the children in also will incur extra expenses, for which they ought to be compensated, except limited by any economies of scale (a third child will probably require less financial support at the margin than a first or second child).

Tort law sometimes attempts to handle these complex problems, but imperfectly. In the jurisdictions with the most sophisticated rules, the courts award only a portion of the decedent's lost income to the dependents, after subtracting expenses and the future consumption of the decedent. The September 11th Compensation Fund also takes this approach. As we have noted, lost income is not likely to be the same as the monetized welfare loss.

Regulatory policy entirely ignores lost support. This would not be a wholly indefensible approach if WTP studies implicitly incorporated the subjects' expectation of lost support for their dependents in case of death.[115] A worker who demands a risk premium for hazardous work might do so in part so that he can purchase extra insurance for his dependents. The WTP figure, then, reflects not only the worker's hedonic loss of life, but the worker's welfare loss from expected lost support for dependents.[116] The problem is that the WTP will not fully reflect the lost support if the breadwinner is not fully altruistic (and full altruism is rare) or if he does not think carefully about the needs of his dependents in the case of his death. We think that the approach we outlined above makes more sense. The adjustment, for the regulatory context, comes from the fact that

[114] See, e.g., Robert S. Weiss, The Impact of Marital Dissolution on Income and Consumption in Single-parent Households, 46 J. Marriage & the Family 115 (1984); Karen C. Holden and Pamela J. Smock, The Economic Costs of Marital Dissolution: Why Do Women Bear a Disproportionate Cost?, 17 Ann. Rev. Soc. 51 (1991).

[115] A similar point can be made about agencies' neglect of grief.

[116] In fact Viscusi has found that when workers' compensation benefits are high, workers do accept a wage offset. See XX.

regulations necessarily protects large numbers of people, and hence estimates for the relevant population are inevitable. What is hard to defend is the complete exclusion of lost support from current regulatory practice.

How much should regulatory agencies value the loss to dependents? Our argument above suggests that the value should be the lost household economies of scale until a new two-person household can be created. For two-person households, this is the extra cost (or lower benefits) that result when a person moves from a two-person household to a one-person household.

As an illustration, imagine that the two-person household has a joint income of $50,000 both before and after separation, but that living costs increase by $5,000 for each person; and that, on average, each person could form a new two-person household three years after the termination of the old one. Now suppose instead that one person dies; the loss of support for the other person is $5,000 per year for three years, her extra expense.[117] Although we have not tried to determine the actual amount, given current levels of income, household economies, and so forth, we suspect that the right amount will be in the thousands or perhaps tens of thousands of dollars per death.

C. Children

Because of its traditional focus on loss of income, tort law ought to produce low numbers for the loss of a child's life. Children lack dependents; therefore, tortfeasors who kill children are not required to pay damages on account of loss of support in loss-to-dependents states. Whether the actual awards are lower for children than for adults is a hard question, given the discretion of the jury, and we do not have a full answer, though existing data provide some clues.[118] By contrast, regulatory policy treats the life of a child

[117] This is a conservative estimate; income and consumption decline precipitously after divorce and remain low for many years. For some (dated) statistics, see Robert S. Weiss, The Impact of Marital Dissolution on Income and Consumption in Single-parent Households, 46 J. Marriage & Fertility 115 (1984). Women also experience a large decline in income after the death of a spouse; see Richard V. Burkhauser et al., How the Death of a Spouse Affects Economic Well-Being after Retirement: A Hazard Model Approach, 72 Soc. Sci. Q. 504 (1991) (limited to after retirement); Michael D. Hurd and David A. Wise, The Wealth and Poverty of Widows: Assets Before and After the Husband's Death, in The Economics of Aging 177 (David A. Wise ed. 1989).

[118] For an earlier study, see Michael Oakes Finkelstein, Patricia A. Pickrel, and Gerald J. Glasser, The Death of Children: A Nonparametric Statistical Analysis of Compensation for Anguish, 74 Colum. L. Rev. 884, 887 (1974) (finding median award of $25,000 for the period 1967-72). The closest comparison we could find is Danzon's data on medical malpractice awards (not limited to adults) for 1970 ($18,770) and 1974) ($52,575). Her sample size is very low, however (3 in 1970, and 17 in 1974), so we are doubtful that

and the life an adult as equivalent, although if agencies used VSLYs, a child's life would be valued at a higher amount because the child has a longer life expectancy.[119] What is the proper treatment?

1. *Parental Judgments*

One possibility is to rely on parental judgments. A recent study attempts to determine the VSL of children by examining the market for bicycle safety helmets for children. Bicycle safety helmets reduce the probability of death by about 4/1,000,000 per year for children between the ages of 5 and 9, and 6/1,000,000 for children between the ages of 10-14. In 1997, the annualized cost of a helmet was about $6.51. The authors found that, given market data on the willingness of parents to buy helmets, the median parent implicitly attributed a VSL of $2.7 million for children between 5 and 9, and $2.6 million for children between 10 and 14; by contrast, the VSL for the adults who bought helmets for themselves was $4.0 million (1997 dollars).[120]

The problem with the study is that it does not even purport to show how much children are willing to pay to reduce the risk of death; it shows what adults are willing to pay to reduce the risk of death to their children. The parent's WTP for avoiding a child's death is not a good proxy for the child's welfare loss because parents are not pure altruists and are willing to trade off their children's risk of death against other things such

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any comparisons can be drawn. Patricia M. Danzon, Medical Malpractice: Theory, Evidence, and Public Policy 41 (1985). In the Verdicts and Settlements data set, the median and mean figures for adults are $1.5 million and $2.8 million; for minors $1 million and $3.7 million. According to Current Award Trends, supra, at 30-32, the median and mean figures for adult males are $2.0 million and $4.4 million; for minor males $1.2 million and $4.9 million (compare figures for adult females and minor females). What is striking here is that the mean for children is higher but the median is lower; the reason why can be seen in the maximum in each case: $55.4 million for adult males and $328 million [sic!] for minor males. As noted, these figures include punitive damages, and we suspect that, although on average juries value children less than adults, the deaths of children are more likely to provoke outrage and extreme awards.

[119] For relevant but inconclusive notations, see Circular A-4, supra note, at 31, noting that "valuation of health outcomes for children and infants poses special challenges," mentioning "studies that examine parental willingness to pay to invest in health and safety for their children," and concluding that "the monetary values for children should be at least as large as the values for adults (for the same probabilities and outcomes) unless there is specific and compelling evidence to suggest otherwise."

[120] Robin R. Jenkins, Nicole Owens, and Lanelle Bembenek Wiggins, Valuing Reduced Risks to Children: The Case of Bicycle Safety Helmets, 19 Contemp. Econ. Policy 397, 404 (2001). See also Paul S. Carlin and Robert Sandy, Estimating the Implicit Value of a Young Child's Life, 58 So. Econ. J. 186, 197 (1991) (finding the parental value of the child 87 percent of adult VSL). Not all studies find lower parental VSLs for children, and indeed some actually find higher; see, e.g., Glenn C. Blomquist, Ted R. Miller, and David T. Levy, Values of Risk Reduction Implied by Motorist Use of Protection Equipment, 30 J. Transport Econ. & Policy 55, 64 (1996) (finding $2 million VSLs for adults and $3-5 million parental VSLs for children (1991 dollars)).

as their own utility from consumption.[121] If we wanted to find out how children value mortality risks, we would need to look at the children's own attitudes and behavior; but children do not usually have income, rarely make their own decisions about purchasing safety equipment, and have poor judgment about risks. For these reasons, a study that attempted to tease out children's WTP to avoid risks would tell us little or nothing about the welfare loss from a child's death. If a ten-year-old child is willing to pay $1 to avoid a risk of 1/10,000, we would know nothing about how tort law and regulatory policy should value his death.

2. *Children and welfare*

What should be done? The touchstone is welfare loss, and a child loses welfare as a result of death. Thus, we should assign some WTP for a child's death. Some arbitrariness cannot be avoided, but one possibility is to follow current practice and to use the standard, uniform VSL used for adults. This approach has the advantage of not being clearly inferior to the alternatives. Another approach would be to take the VSLY for adults, and multiply it by the expected number of years of life. This approach is consistent with the general interest, in many circles, in focusing on statistical life-years as well as or in addition to statistical lives.[122] Yet another possibility would be to estimate a child victim's future income, and then determine his VSL or his VSLYs by extrapolating from the figures of an adult who has that child's future income.[123] In the latter two cases, children would have higher valuations of life than adults do, which appears intuitively correct.[124] We think that the second approach seems the most reasonable, but there is no simple way to establish its superiority.

3. *Offsetting parental behavior*

A conclusion in favor of any one of the three approaches must be qualified, however. The risks faced by children are, to a considerable extent, controlled by their

[121] This seems to be the conclusion of Jenkins et al., supra, at 407, and puzzlingly they appear to reject the relevance of their own study and advocate use of adult VSLs for children.

[122] The approach owes its origins to Richard Zeckhauser and Donald Shephard, Where Now For Saving Lives, 40 L. & Contemp. Probs. 5 (1976). For an overview, see Cass R. Sunstein, Lives, Life-Years, and Willingness to Pay, 104 Colum. L. Rev. 205 (2004).

[123] Cohen, supra. This approach strikes us as incorrect for the reasons given in Part III.B.

[124] This would not necessarily be the view of those who think that welfare is entirely subjective. But we do not accept this view about welfare. Few people outside of economics think it is correct, and even economists do not believe that it is proper for children. See generally Matthew D. Adler and Eric A. Posner, Rethinking Cost-Benefit Analysis, 109 Yale L.J. 165 (1999).

parents, and one must be careful that regulatory policy and parental autonomy do not clash, leading to perverse results. In a sense, this problem is not unique to the context of valuing children's lives. Offsetting behavior can occur in many contexts.[125] But the mechanisms here have distinctive features.

To see the problem, consider a simple case where the household that benefits from a regulation also incurs its full costs. Suppose that Parent (P) is willing to pay $20 to avoid a 1/100,000 risk of death for his child (C). An agency issues a regulation that forces P to pay, say, $50 to avoid this risk by buying safety helmets, car seats, or some other child safety device. Although P must now pay $50 to reduce this risk in order to avoid a legal sanction, P retains the discretion to spend less money on C. If P can save money by reducing safety along some other margin, one not regulated by the agency, P will do so. For example, perhaps P will stop sending C to school on the (safe but expensive) bus and put him in a (cheap but riskier) car pool. And even if P cannot do this, P might spend less money on C in other ways: for example, purchasing fewer toys or clothes or food. Under the stated assumptions, both P's and C's welfare will decline as a result of the regulation.[126]

These problems do not show that children's VSL should always be treated as lower than that of adults, but they point out some difficulties with the contrary view.[127] The proper degree of adjustment is an empirical question on which information is absent. If parents adjust in the manner described, then it would be incorrect to base a child's VSL on the VSLYs of adults. On the other hand, we do not know whether or to what extent parents adjust in this way, and it might seem implausible to some readers.

We do not have a simple conclusion about appropriate valuation of mortality risks faced by children. Certainly tort law errs by excluding the child's hedonic loss and including only the distress felt by parents. For regulators, perhaps the best approach would be to multiply VSLY by the number of remaining life-years, with a lower amount (perhaps in the range of the parental valuation of $2 to $3 million) used for regulations

[125] See Gerald Wilde, Target Risk (1994)

[126] See, e.g., Theodore C. Bergstrom, Benefit Cost Analysis and the Entanglements of Love (unpublished m.s. 2003).

[127] There are numerous complications that we cannot discuss. For example, two parents; two parents who are divorced or hostile to each other; and parents who value their children differently. See Bergstrom, supra, for discussion. In addition, we might not care that the child's welfare declines if his safety increases; that is, it may be fine, or good, if the parent reduces toys but not safety in response to regulation.

for which parents are expected to adjust (perhaps child safety seats). Tort law should award an amount within this range for the hedonic loss to the child from his death.

D. Loss to Society

Commentators sometimes argue that tort law undervalues the loss of life because it ignores the cost to "society."[128] Most people produce value that they do not fully consume or give to dependents; this value benefits strangers in the larger society. Workers produce goods that consumers value more than the price that they pay; entrepreneurs start new businesses that employ people; people give to charity; inventors invent products whose value is greater than what the inventors can capture through patent law; the same is true of authors of books and the protections of copyright law; there are countless Good Samaritan acts; and many people devote their lives to public service. When these people die, isn't there a loss to society beyond the loss to the person who dies and his immediate family and friends? Perhaps oddly, neither tort nor regulatory law counts these losses. [129] Here as elsewhere, there are obvious difficulties of monetization, but the failure to assign any value at all is puzzling.

One response is that these benefits may be smaller than they first appear. Labor markets are vast, and the cost of replacing a worker who dies will generally be trivial. (Recall that we are speaking here of losses of society; losses to the worker and dependents are assessed independently.) In addition, many people do bad things as well as good things, and presumably the hostile and aggressive acts must be subtracted from the Good Samaritan acts. Finally, to the extent that the size of the population is a concern for economic growth or national security purposes, the government has many tools at its disposal for adjusting it. Temporary visas can be issued for foreign workers; immigration can be increased; and other barriers against migration can be reduced or eliminated. And birth control policies can be adjusted to increase or decrease population as necessary.

Still, serious thought should be given to monetizing the loss to society when a person dies. Assume again that the legal system had a social hedometer, one that could measure that loss and turn it into monetary equivalents. It seems clear that if an accurate

[128] See, e.g., Miller, supra.

[129] In tort law, the doctrine of proximate causation prevents recovery by people whose injuries are remote from the tort. This doctrine seems to assume that the injuries to these people are likely to be small or hard to prove.

assessment of the loss could be made, those who subject people to mortality risks should be required to take that loss into account. The question is how to proceed in the absence of a hedometer. One possibility would be to try to determine how much people are willing to pay to avoid the deaths of casual acquaintances. This question raises some of the same issues as those involved in the monetization of grief. If the relevant amounts are likely to be low, current practice might be justified; but a great deal of additional work needs to be done on this topic.

E. Foreigners

Many wrongful acts kill people who are not citizens of the United States. Some of these people reside in the United States, either legally or illegally ("alien residents," for our purposes); others live outside the United States ("alien nonresidents"). Some of these wrongful acts are committed by Americans or firms predominantly run or owned by Americans; others are committed by aliens or foreigners. All of these acts are potentially governed by American tort and regulatory law.

Let us consider two examples, one from tort and one from environmental regulation. In Filartiga v. Pena-Irala, a case involving the torture and murder of a Paraguayan citizen by a Paraguayan police official, the plaintiffs, who were the brother and father of the victim, brought a claim in an American court under the Alien Tort Statute, and obtained damages of more than $10 million.[130] A magistrate had initially awarded them $375,000 in compensatory damages for emotional distress, funeral and medical expenses, and so forth; the district court also awarded punitive damages of over $9 million. The court claimed to base the compensatory awards mainly on the domestic law of the countries in which the torts took place. If so, the compensatory damages were probably low for the same reason that they are low in the U.S.: domestic law in foreign countries does not award damages for hedonic loss, but only for lost income and the like.[131] However, as a result of the punitive award the damages were far in excess of what

[130] Filartiga v. Pena-Irala, 577 F. Supp. 860 (1984).

[131] We lack VSL statistics for the Paraguay or the Philippines, but we do have these statistics for India, which range from $1 to $4 million (2000 US$) (Viscusi and Aldy, supra, at 28); the Philippines' per capita GDP is almost 80 percent higher than India's (CIA World Factbook, http://www.cia.gov/cia/publications/factbook/rankorder/2004rank.html); the Philippines' VSL would almost certainly be in that range if not higher.

would have been available under Paraguayan law, because punitive damages are not awarded in wrongful death cases in Paraguay.[132]

Many toxic substances produced in the United States contaminate territory outside American borders. Chemicals such as PCBs migrate across borders through atmospheric processes, and may be ingested by people living far away. Most of the EPA's regulatory work involves purely domestic statutes, and the EPA refuses to count foreign lives when evaluating regulations based on those statutes, even when the substance being regulated crosses borders and harms foreign environments.[133] If it is proper to count the lives of foreigners, then the cost-benefit analyses that EPA has relied on undervalue the benefits of regulations.

These examples reflect an international version of the domestic tension between tort and regulatory law. Because tort law in other countries, like in the U.S., is mainly limited to compensating dependents, foreign tort awards usually undervalue the victim's loss. Because American courts generally defer to foreign law in case of torts committed on foreign soil, the low tort awards in other countries are implicitly incorporated into American foreign policy, and, in particular, American VSLs for foreign lives. By contrast, American regulatory policy generally ignores foreigners. Which approach is correct?

Our argument so far has been that the VSL should reflect people's willingness to pay to avoid risks. Because the willingness to pay to avoid risks increases with income, poorer people have lower VSLs than wealthier people.[134] Because many aliens are substantially poorer than Americans, they will have very low VSLs.[135] Reflecting cross-national wealth differences, VSL is highly variable across nations.[136] Studies find a VSL as low as $200,000 for Taiwan, $500,000 for South Korea, and $1.2 million for India—

[132] Filartiga, 577 F. Supp., at 864.
[133] Ronald Fein, Note, Should the EPA Regulate Under TSCA and FIFRA to Protect Foreign Environments from Chemicals Used in the United States?, 55 Stan. L. Rev. 2153, 2169-70 (2003). See also Thomas W. Merrill, Golden Rules for Transboundary Pollution, 46 Duke L.J. 931 (1997).
[134] For evidence, see Viscusi and Aldy, supra note.
[135] See id.
[136] Id.

but $21.7 million for Canada and $19 million for Australia.[137] Consider the following table[138]:

Table 4: VSL Across Nations

Nation and Year of Study	VSL (in 2000 US$)
Japan (1991)	$9.7 million
South Korea (1993)	$0.8 million
Canada (1989)	$3.9-4.7 million
India (1996/97)	$1.2-1.5 million
Taiwan (1997)	$0.2-0.9 million
Australia (1997)	$11.3-19.1 million
Hong Kong (1998)	$1.7 million
Switzerland (2001)	$6.3–8.6 million
United Kingdom (2000)	$19.9 million

In addition, some aliens may have lower VSLs than Americans because of cultural and social differences. For example, if people in a foreign culture do not fear death as much as Americans do, they will have lower VSLs, all else equal. The conclusion that aliens should have lower VSLs follows from the argument that VSLs should reflect social costs.

This view might seem offensive,[139] but certainly as a general rule, it is more consistent with the well-being of aliens than the contrary view is. First, consider the case where a particular alien in a foreign country both enjoys the benefit and bears the cost of a regulation or tort rule. For example, a labor regulation requires foreign suppliers of goods for the American market to provide safety devices to workers. The workers are willing to pay $20 to avoid a 1/100,000 risk of death; the safety device eliminates that risk, but results in a reduction in pay of $30. Unless the willingness to pay figure is a product of ignorance or some failure of rationality,[140] the regulation harms rather benefits the workers.

[137] See id. at 27-28.
[138] Drawn from id. at 26-27.
[139] Indeed, courts' discomfort with it might explain their willingness to award punitive damages – even when they are not available under foreign law, and thus the award violates choice of law principles – resulting in very high levels of damages. E.g., Filartiga, supra (awarding $10 million punitive damages, $375,000 in compensatory damages).
[140] See Sunstein, Valuing Life, supra note.

Second, consider the case where one nonresident alien enjoys the benefit of the regulation, and another alien (living in the same country) bears the cost. A regulation requires factories to reduce levels of emissions: neighbors would be willing to pay $100 to reduce the risk of death created by the emissions but local consumers bear a cost of $200 from higher prices. If the neighbors and consumers have equal wealth, the regulation simply redistributes wealth from one group to another: it does not increase welfare but reduces welfare. If the neighbors are poorer than the consumers, then the regulation might be justified, but what justifies it is the distributional benefit, not the use of inflated VSLs. If the U.S. wants to effect a redistribution of wealth between groups in other countries, and seeks to use regulatory and tort law to do so, there is no reason to limit these rules to cases of death; they could be used for nonfatal harms as well. And the use of inflated (that is, American) VSLs would only obscure the nature of the regulatory intervention.

A further question is this: Even assuming that the redistribution would be in the right direction, why would the U.S. want to redistribute wealth in other countries through regulatory and tort law? One problem is that, unless the U.S. seizes control of the government of the foreign country, the government will be able to undo the American redistribution by using tax and other instruments. In any case it would normally make more sense for the U.S. to negotiate with the government for redistributions of wealth, rather than unilaterally intervening. Finally, if unilateral intervention is to occur, the courts (in the case of tort law) would seem to be a poor vehicle; better to rely on the state department and other executive branch agencies. That the U.S. has rarely concerned itself with the distribution of wealth in other countries—focusing instead on trade, security, and human rights—suggests that indirect redistribution through tort and regulatory law would not be politically sustainable.

Third, consider the case where nonresident aliens enjoy the benefit of the regulation, and American citizens bear the cost. Suppose that regulation that reduces emissions that damage the ozone layer harms mainly Americans, who pay the higher prices, while benefiting mainly people living in other parts of the world. Consider two versions of this regulation: the first (low pollution control) is based on a cost-benefit analysis that values foreign lives lower than American lives. The second (high pollution

control) is based on a cost-benefit analysis that values foreign lives and American lives equally, at the American level. Under the stated assumptions, the second redistributes resources from Americans to people living in other countries. Which regulation is superior?

In the abstract, the answer is hardly clear, and the question cannot be sensibly approached without consideration of American foreign policy toward the nations that benefit from the regulation. Let us consider the relation between the U.S. and, say, India. The two states can gain a lot from each other by cooperating, but there is also a danger of conflict. To simplify, suppose that the U.S. wants three things from India: security cooperation (such as flyover rights); an open market for U.S. goods; and an improvement in the treatment of religious minorities. India seeks from the U.S. similar things: diplomatic assistance with its ongoing disputes with Pakistan; an open market for Indian goods; and an improvement of American treatment of Indian residents. Suppose that at a hypothetical stage 1, India and the U.S. achieve a balance between their aims: each gives a little of what the other wants.

Now at stage 2, an American regulatory agency issues an environmental regulation that happens to benefit India considerably, and at great cost to American citizens. At this point, the American diplomatic authorities might argue that because the U.S. is conferring a new benefit on India (say, less flooding of coastal areas), India should respond by conferring a new benefit on the U.S. (say, more trade). India could respond by saying thanks for reducing coastal flooding—that is important—but it is not more important to us than preserving our domestic X industry. In short, the new regulation disturbs the cooperative equilibrium between the U.S. and India: the U.S., perceiving itself as giving more than it is getting, will (in theory) respond by withdrawing some other benefits, and India will retaliate. The new equilibrium could involve a lower level of cooperation—one in which the U.S. gives India something of little value to India and so gets something of little value in return—unless the U.S. government can change the regulation in a way that benefits India less.[141]

Our point is that under certain circumstances, regulations and tort rules that are based on inflated foreign VSLs will redistribute wealth from Americans to foreign

[141] Of course, that may be impossible, in which case cooperation should not decline.

governments. Such transfers would not be wildly popular in the abstract, at least among Americans. They may nonetheless be desirable for reasons of foreign policy or social justice, but they should be recognized as such; the use of the inflated VSL conceals the magnitude of the transfer and even its nature. Further, transfers—whether disguised through inflated VSLs or undisguised—should cohere with foreign policy; otherwise, they will lead to perverse results or be ineffective. The simple conclusion is that in many imaginable circumstances, a high VSL, for people in other countries, will produce perverse redistribution or redistribution for which there is no strong claim—and that even when the redistribution through a high VSL seems desirable (because it benefits poor people on balance), there are many questions about whether regulatory agencies should adopt it. It follows that as a general rule, both agencies and courts should use a VSL that attempts to match the figure in the relevant nation.

IV. Proposals for Reform

A. Use of VSL in Regulations

Tort law offers two principal lessons for regulatory policy. The first involves the need for a greater degree of individuation. The second involves the need to pay attention to the interests of dependents. A properly designed system of valuation would move substantially in both directions.

1. *Individuation*

We have seen that under the theory that agencies now use, VSL is calculated on the basis of people's willingness to pay. That very theory raises serious doubts about the government's use of a uniform number. The appropriate value varies across both risks and persons. If, for example, the risk is accompanied by a high degree of pain and suffering, it deserves more attention than if it is not—a conclusion that is supported by studies finding a kind of "premium" for bad deaths.[142] Agencies should therefore provide a higher VSL for cancer risks than for other risks, a possibility that EPA has recognized

[142] See Revesz, supra note.

in its "sensitivity analysis" for arsenic.[143] A great deal more should be done in this vein.[144] As tort law demonstrates, a uniform number is extremely difficult to defend.

Variations across persons are important as well. To be sure, it is impractical to think that regulators should fully individuate risks across persons, in part because regulations often affect many people at once. But less fine-grained distinctions are possible. For example, people over sixty tend to show a lower VSL than people between thirty and forty.[145] Regulators might build on these figures to generate different numbers for programs protecting people at different points along the age spectrum. Putting the difficult case of children to one side, agency rules should have a lower value when the benefited class consists largely of elderly people. A movement in this direction would have significant consequences for valuation; it would drive down the monetized benefits of a number of programs delivering health gains largely to senior citizens.

Additional distinctions are possible. If a program would benefit largely wealthy people, regulators might use an unusually high VSL—a point that would support a higher VSL for safety decisions involving airlines (the exact opposite, not incidentally, of current practice, which involves an unusually low number for airline safety[146]). More controversially, programs protecting the poor might be given a lower VSL, in a way that tracks the approach of tort law, at least where those who benefit from regulation are also paying for it. A possible objection to this approach is that in some circumstances, a high VSL, for the poor, might be beneficial to the poor, simply because they receive benefits for which they pay only a fragment. We do not resolve the obvious empirical and ethical complexities here.[147] We note simply that a higher degree of individuation would be desirable, that in most cases it would raise no serious ethical problems, and that tort law shows that a movement toward greater individuation is both feasible and consistent with longstanding practices and intuitions.

[143] See note supra.
[144] See Sunstein, supra note.
[145] Joseph P. Aldy and W. Kip Viscusi, Age Variations in Workers' Value of a Statistical Life (2003), forthcoming.
[146] See Table 2, supra, showing a lower figure for the FAA than for the EPA.
[147] See Sunstein, supra.

2. *Dependents*.

For regulatory policy, the most obvious gap is that agency numbers do not recognize the fact that a death causes welfare losses to many people other than the victim. If a worker is killed as a result of carcinogens in the workplace, others will almost always be affected. Agency failure to take account of the welfare losses results in numbers that are far too low.

We have suggested the importance of distinguishing between two sets of losses: grief on the one hand and lost income on the other. Following tort law, full individuation would take account of the fact that the size of those losses very much depends on the particular situation. Other things being equal, the loss of a parent with six young children causes more serious harm than the loss of someone without dependents. If our earlier calculations are correct, several million dollars would be added to the conventional assessment of the benefits of a regulation that saved that parent's statistical life. A serious difficulty here is that agency regulations protect broad classes of people and hence it is quite impractical to think that agencies should make fully individual judgments about the welfare losses. But it is not impractical to think that agencies should adjust their numbers in a way that ensures that serious welfare losses are not ignored. As in the case of statistical risks, contingent valuation studies and market evidence might be consulted to generate appropriate numbers for grief. We have offered some suggestions about how this might be done. For regulations, individual assessments are of course impossible, but a positive number is better than no number, and population-wide means would be a sensible place to start.

In the regulatory context, there is a cautionary note. Any effort at individuation would have a high degree of political salience and would undoubtedly mobilize affected interests. Even if the social science were less ambiguous than it now is, well-organized groups would undoubtedly engage in special pleading, attempting to move agency practices in their preferred directions. A uniform number helps to insulate agencies from the relevant pressures. In the context of tort suits, individuation does not face those pressures, and hence there is little need for insulation. In principle, however, individuation is clearly desirable, and it seems quite pessimistic to think that the effort to

produce greater accuracy should be rejected because of the possible effects of interest-group maneuvering.

B. Use of VSL in Tort Law

In wrongful death actions, damages should be calculated in the following way.

1. *The Hedonic Loss of the Victim*

For deterrence purposes, the tortfeasor should pay the amount that the victim would be willing to pay to avoid the risk that was imposed on him by the tortfeasor's class of actions, divided by that risk (R/q). Damages should not be based on lost income; as in the regulatory context, lost income is at best a proxy for the victim's loss. Deterrence can be satisfied through payment to the government, but if it is paid to the estate or dependents, then indirect compensation is also achieved.

The amount can be calculated in two ways. First, the VSL (or VSLY) used by agencies could be used, with any adjustments as necessary to reflect individual factors: the defendant's risk preference, life expectancy (if VSLY is used), wealth, quality of life, and so forth. Indeed, it is possible that the victim's own wages will reflect his VSL, if he has a risky job. So long as agencies use a uniform figure, courts might start with the standard $6 million figure, and then make adjustments as appropriate. If agencies used more refined figures, as we have argued that they should, then courts might begin with those figures instead, and make appropriate adjustments from that amount. Second, the jury could be asked to determine the hedonic loss. However, the proper jury question is not "what is the value of the life's pleasures lost by the victim?" This question is too abstract. A better question would be: "estimate the amount of money that the victim would have paid to avoid the risk in question." [148] Of course an abstract answer to that question would be unreliable; VSL studies should be used to educate juries about common valuations, so that their own estimates will be informed rather than arbitrary.[149]

[148] Arlen argues that courts are incapable of making such calculations, claiming that "courts' inaccurate calculations would come no closer to efficient recovery amounts than would legislation establishing a flat statutory amount for wrongful death in the hope that the results would be efficient on average." Arlen, supra, at 1134. It might be true that legislatures can do better than courts, but that is no argument for awarding zero damages or an (arbitrary) constant amount instead. Recall too that we are not exploring the complex issues raised by the possible difference between willingness to pay and willingness to accept.

[149] Many courts have refused to admit testimony about VSL studies, arguing that the science does not meet the Daubert standard. See, e.g., Ayres v. Robinson, 887 F. Supp. 1049 (N.D. IL 1995). This seems to us a mistake. For a discussion, see Reuben E. Slesinger, The Demise of Hedonic Damages Claims in Tort Litigation, 6 J. Legal Econ. 17 (1996). Some courts also reject VSL studies on the ground that these studies

To ensure consistent and rational awards, we would strongly prefer the first approach, on the ground that juries are not well-equipped to answer these questions; but if a strong role for the jury is deemed important, the second would also work so long as the jury's judgments are disciplined by expert witnesses and the court.

This reform would have a significant impact on tort awards, especially for the elderly in non-hedonic loss states. We can already see the logic of our argument at work in some of the hedonic loss states. Consider Thomas v. Hilburn,[150] in which the jury awarded wrongful death damages of $300,000 to the son of the 75 year old victim. On appeal, the defendant argued that damages should be reduced to $66,311 for lost income, plus a few thousand dollars more for medical expenses, funeral expenses, and property damage. The court rejected the argument because Mississippi was (at the time) a hedonic loss state. Although our approach would have suggested a verdict of a few million or so, depending on the wealth and other characteristics of the victim, the court clearly recognized the key point that the hedonic loss of an elderly man is much higher than his lost income.[151]

In the tort context, there is an additional complication. Valuation of statistical risks has occurred for risks of specified magnitudes, usually ranging from 1/10,000 to 1/100,000.[152] Insofar as tort law is dealing with risks in this range, use of agency figures is fully appropriate. But it should be clear that these numbers need not be taken to support a VSL that is independent of probability.[153] Suppose that people would be willing to pay $60 to eliminate a risk of 1/100,000. From this it does not follow that people would be willing to pay $6000 to eliminate a risk of 1/1000, or $60,000 to eliminate a risk of 1/100,

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reflect the losses to other people, not to the victim who is the subject of the tort dispute. However, courts frequently use statistics about other people in order to award damages in tort cases. For example, when courts calculate lost income in order to determine damages for dependents, they use mortality tables; these tables are based on the lives of *other* people, not on the victim's own life, which would not make any sense. Just as courts use statistics about other people in order to estimate the victim's life expectancy, courts should use statistics about other people in order to estimate how much the victim would have been willing to pay in order to avoid a risk of death.

[150] 654 So. 2d 898, 903 (Miss. 1995).

[151] See also Motorola Communications and Electronics, Inc. v. Wilkerson, 555 So. 2d 713 (Miss. 1989) (allowing $150,000 award for the death of an 85 year old man); Marcotte v. Timberlane/Hampstead Sch. Dist., 733 A.2d 394, 407-08 (N.H. 1999) (allowing $900,000 award for the death of a child whose lost future income was about $700,000). New Hampshire also recognizes hedonic losses in wrongful death cases. See supra.

[152] See, e.g., W. Kip Viscusi, The Value of Life: Estimates With Risks by Occupation and Industry, 42 Ec. Inquiry 29, 33 (2004) (showing fatality risks ranging from about 1/100,000 to 45/100,000).

[153] See Richard Posner, Catastrophe: Risk and Reason (forthcoming 2004).

or $600,000 to eliminate a risk of 1/10. It is plausible to believe that people's WTP to reduce statistical risks is nonlinear.[154] As the probability approaches 100%, people become willing to pay an amount for risk reduction that rises nonlinearly to 100% of their income, and—at some point—become unwilling to accept any amount in return for giving up their entitlement to life.[155] From this it follows that if a defendant imposes risks that are far higher than those with which agencies deal, the agency figures are too low, and hence the tort system should use significantly higher ones.

The sheer variety of wrongful death actions, in terms of both probability and kind of death, severely complicates the inquiry into appropriate damage awards. Insofar as the tort system is dealing with probabilities in the general range with which agencies deal, it can build on (appropriately reformed) agency practice. Insofar as the tort system is dealing with the most egregious conduct—homicide, for example—the regulatory analysis of WTP does not apply directly, but a standard amount of (say) $6 million at least provides an appropriate floor. Insofar as the conduct imposes high probability risks, as through gross negligence, a similar floor is appropriate, supplemented perhaps by punitive damages. These suggestions are in line with our general emphasis on the fact that all mortality risks are not the same. What cannot be defended is the total exclusion of hedonic damages in wrongful death actions.

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[154] See id.

[155] There is a great deal of work on disparities between willingness to pay and willingness to accept (WTA). See, for an overview, Russell Korobkin, The Endowment Effect and Legal Analysis, 97 Nw. U.L Rev. 1227 (2003). Such disparities are found in the context of risks. See, e.g., see W. Kip Viscusi et al., An Investigation of the Rationality of Consumer Valuations of Multiple Health Risks, 18 RAND J. Econ. 465 (1987). It follows that people would pay less to eliminate a risk of 1/100,000 than they would demand to be subject to that same risk. See id. One advantage of the market data on which agencies currently rely is that the WTP/WTA disparity is essentially irrelevant. If workers and consumers who face a risk of 1/100,000 receive $60 in compensation, the result can be described in terms of either WTA or WTP; any such description is simply a matter of framing. But we lack reliable market data about how to value much higher risks -- say, risks of 1/50, 1/20, or 1/10. And for such risks, willingness to accept and willingness to pay figures surely diverge, not least because the income constraint applies to WTP but not to WTA. People would undoubtedly pay a great deal to eliminate a mortality risk of 1/20; but they would demand even more to be subject to that risk, and many people would not incur that risk for any amount. It is not entirely clear, in principle, whether WTP or WTA is appropriate, though our view is that willingness to accept is correct and therefore the appropriate compensatory award is either infinite or higher than anyone can pay. Thus, a billionaire who murders someone ought to forfeit his entire wealth. As a practical matter, however, it probably does not make much difference that the tort system does not generate such high awards, given that the entire wealth of most murderers is extremely limited.

2. *Harm to Survivors*

As we have seen, calculating the loss to survivors is difficult in practice, but conceptually straightforward. For deterrence purposes, survivors should recover for their welfare loss—this means grief, mental distress, loss of companionship, and the like. It is less clear what dependents should recover in terms of lost support (such as lost income attributable to their care). The conceptually proper recovery is the amount of money that would make the survivor just as well off (financially) as he would have been if the death had not occurred, which will usually be tied to the loss of household economies of scale and the breadwinner's degree of altruism. This amount may be higher than lost income (if the victim does a lot of work for the household that is not compensated in the market). And it may be lower (if the survivor can easily get a job and the victim was never very generous in the first place).

If our approach were adopted, tort damages would rise, especially for children and the elderly. As we have seen, damages for wrongful death are currently under about $3 million, based on lost income, mental distress, and the like. Under our system, they are likely to be as much as $6 million or higher for the average person. As for children, tort damages currently should be low in jurisdictions that exclude lost income (though it is not clear that this is the case); and for the elderly, tort damages currently should be (and apparently are) low even in jurisdictions that include lost income, given that their earning years are almost over. By contrast, under our approach their damages are likely to be, again, in the $6 million or higher range.[156] For adults with dependents, we suspect that an additional several hundred thousands of dollars per dependent would be added to the $6 million baseline. [157]

[156] Elderly people apparently have VSLs that are either equal to (or even higher than) or not much lower than those of younger people. See Aldy & Viscusi, supra.

[157] If the victim incurs unusual pain and suffering prior to death, including the distress of anticipating one's own death in the near future, this cost may not be reflected in standard VSLs. Thus, additional damages should be awarded for them. Damages for medical and funeral expenses should also be awarded. See Mark Geistfeld, Placing a Price on Pain and Suffering: A Method for Helping Juries Determine Tort Damages for Nonmonetary Injuries, who suggests using WTP estimates, 83 Calif. L. Rev. 773 (1995). See also David W. Leebron, Final Moments: Damages for Pain and Suffering Prior To Death, 64 N.Y.U. L. Rev. 256 (1989).

V. Positive Questions

Our comparison of tort law and regulatory policy raises an obvious positive question. Why do these two areas of law take such different approaches to valuing lives? The beginning of an answer to this question is that even though the two areas of law have an overlapping purpose—the deterrence of harmful conduct—they also have radically different historical origins and orientations: tort law is ex post and individualized, while regulatory law is ex ante and generalized. As a result, tort law is naturally more particularistic and less rule-bound. The ex ante focus of regulation pushes administrators away from case-specific standards and in the direction of rule-bound judgments. But this point raises many complexities.

A. In General

Tort law's ex post and individualistic orientation has several consequences. First, the implicit (or explicit) valuation of human lives in the tort context is information-rich. Courts have access to a great deal of evidence about the particular parties and circumstances. Under the rules of evidence, all relevant evidence may be introduced to the court, and both plaintiff and defendant have strong incentives to take advantage of these rules. Given that the victim is a real, identifiable person, it is natural for the court to determine the actual loss, including losses to dependents, rather than to rely on statistical averages. In fact there is no need to rely on such averages, which provides less accurate information than the facts themselves.

Second, tort remedies direct the decisionmaker to compare the victim's post-tort state with her pre-tort state, and to ignore the rest of society. This approach works well enough when the tort causes a financial loss or a physical injury, but when it kills the victim, the decisionmaker has no way to compare post-tort and pre-tort well-being in a way that can be reliably monetized. To determine the hedonic loss from death, one cannot look at the actual victim's experience of death; one can rely only on statistical inference based on generalization from the rest of society. But in view of judicial traditions, this would be unfamiliar and even odd in the tort setting.

Third, and following from the first two points, tort damages tend to be highly variable. Juries lack reference points, so their judgments will depend heavily on the

presentation of evidence by lawyers, and on whatever anchors,[158] prejudices, and expectations citizens bring to the jury box. Juries might also react emotionally to the case, or misunderstand jury instructions, and allow irrelevant factors (like a desire for revenge) to influence their determination of the award.

Fourth, tort law has low public visibility, at least at the system-wide level. Individual awards may receive considerable public attention, but the system of awards—the median award, the mean award, the variance—does not.[159] Hence public scrutiny is relatively weak unless and until a salient network of awards (as in the case of the September 11 fund) is announced. The difficulties of monetization, the variable figures, and the possible arbitrariness of many outcomes attract little in the way of scrutiny and review, not least because of the ex post nature of litigation and the fact that awards are issued one at a time.

Compare regulatory law. Regulatory decisions are ex ante and highly abstract. The victims of the regulated conduct are not identified, and so their personal characteristics do not stand out (although sometimes a disaster or crisis may provoke the regulation[160]). Whereas court cases are emotionally rich, regulatory decisions often (though not always) seem dry and technical, even though usually much more is at stake.

The ex ante and general orientation of regulatory policy has several consequences. First, because one cannot identify the actual people benefited by a regulation, one must rely on averages. The usual notion is that although all individuals are different, differences will balance each other out, so that averages can be used. Thus, if a regulation protects people of type X with a VSL of $7 million and people of type Y with a VSL of $5 million, regulators use the average valuation of $6 million for a regulation that affects people evenly divided into the two types.

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[158] On the relevance of anchors, see Gretchen Chapman and Eric Johnson, in Heuristics and Biases: The Psychology of Intuitive Judgment (Thomas Gilovich et al. eds. 2002).

[159] Indeed, the extreme awards that receive media attention are, according to some, too rare to be a matter of concern. See Deborah Jones Merritt and Kathryn Ann Barry, Is the Tort System in Crisis? New Empirical Evidence, 60 Ohio St. L.J. 315 (1999). A similar argument has been made about punitive damages; see Theodore Eisenberg, Neil LaFountain, Brian Ostrom, David Rottman, and Martin T. Wells, Juries, Judges, and Punitive Damages: An Empirical Study, 87 Cornell L. Rev. 743 (2002) (arguing that punitive damages are roughly correlated with compensatory damages); but see and Joni Hersch and W. Kip Viscusi, Punitive Damages, 33 J. Legal Stud. 1 (2004) (disputing this claim).

[160] See Timur Kuran and Cass R. Sunstein, Availability Cascades and Risk Regulation, Stan L Rev (1999).

This reasoning is not implausible, and sometimes averages are appropriate despite their crudeness; but they can lead regulators astray. Some regulations affect only persons of type X, and other regulations affect only persons of type Y; then different valuations should be used. Indeed, we know that some regulations protect people against cancer, a risk that people are willing to pay a premium to avoid, whereas other regulations protect people against sudden unanticipated death, a risk that occasions less in the way of public concern.[161] So too, some regulations affect the poor more than the rich, urban people more than rural people, and so forth. Under the very theory that animates current regulatory practice, individualized VSLs, taking account of these differences, are important.

Second, regulatory decisions affect more people than a tort award does, and thus are more politically salient. The greater political salience of regulatory decisions may have good effects simply because public scrutiny can be a corrective against ill-motivated or foolish decisions; but here we focus on some bad or troubling effects. The most obvious is that the symbolism of sensible and disaggregated regulatory decisions may bother people because such decisions seem in conflict with other values—here, we have in mind the controversy valuing human lives at all, or the likely more intense controversy over valuing the lives of the rich more than the lives of the poor.[162] The risks of public skepticism may also explain agencies' failure to value the lives of children properly and openly.

By contrast, the isolation of tort awards suppresses these symbolic concerns. Almost no one complains about the fact that poor people obtain lower damages in tort awards because they have lost less future income; and the existence of the disparity, and its longstanding character, at least raises problems for those who believe that ethical principles require all deaths to be valued the same way. But it appears to be politically difficult to draw the logical conclusion that VSLs for poor people should be lower than VSLs for rich people in regulatory decisionmaking.

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[161] See Revesz, supra note; Hammit and Liu, supra note.

[162] Consider the controversy over the idea of "life years," an idea that strikes many people as ethically problematic because it treats elderly people as less valuable than younger people. See Ackerman and Heinzerling, supra note.

We are unable to explain why agencies have neglected the losses to dependents. One possible answer is that agencies assume that victims' WTPs for bearing risks of death incorporate these costs; but as we have explained, it is unlikely that these WTPs incorporate these costs fully. Another possible answer is lack of information; it is not easy to generate a plausible number to capture the costs to dependents on some population-wide basis. But this problem ought to be remediable. A probable contributor to the gap is that cost-benefit analysis and the use of VSLs is in its infancy—as a formal part of regulatory law, it is only about twenty-five years old[163]—and agencies have focused on the large problems while neglecting or overlooking more subtle issues. But it is now time for the VSL methodology to advance to a new stage of sophistication.

B. September 11 and Compensation

The different orientations of tort and regulatory law were reflected in an interesting way by the decisionmaking process of the commission that was set up to award compensation to victims of the 9/11 terrorist attack. We have briefly outlined the resulting regulations. Before returning to this topic, let us conduct two thought experiments.

First, suppose that Congress had never set up the 9/11 compensation fund, and instead the victims and survivors had sued under state tort law. Suppose they succeeded in establishing the liability of defendants such as the airlines. How would damages have been awarded? It is clear that wealth differences would have been seen in wrongful death and survivors' awards. The dependents of investment bankers would have obtained awards far in excess of those obtained by the dependents of fire fighters. In addition, the awards would have varied significantly in light of the different characteristics of each victim. But there also would have been considerable inexplicable variance in the awards, variance that would not be traceable to relevant factors but to the vagaries of jury decisionmaking and the law of tort. Hence inequalities would have been pervasive—some a justified product of existing rules, others a result of simple "noise" in the system.

Second, suppose that an agency had, prior to the 9/11 attack, issued regulations designed to force the owners of buildings such as the World Trade Center to install safety devices that would have saved lives in case of a terrorist attack or similar disaster. Here,

[163] See Executive Order 12291, supra.

we can be sure that the agency would have used uniform valuations—such as $6.1 million per life saved—that would have ignored wealth differences and other differences between victims. The agency would also have ignored dependents.

How did the 9/11 commission make its decisions? On the one hand, the commission was directed by Congress to rely on tort principles, and for that reason it used formulas that took into account wealth differences.[164] Estates of investment bankers did receive more compensation than estates of fire fighters.[165] In addition, awards were an increasing function of the number of dependents. On the other hand, public and political discomfort with these disparate awards—which seemed to dishonor the fire fighters, and also to distinguish victims along class lines—led the commission to adopt awards that were less dispersed than would have occurred under the tort system.[166]

There is a lesson here. Because individual tort cases concern just one person or a few people, awards are unlikely to be politically salient or to be influenced by irrelevant political considerations. But because they are ex post and individualized, they usually fail to take advantage of information that is accessible only at the level of the general population. The 9/11 Commission combined the virtues and flaws of both approaches. Because of the political salience of the task, and because awarding damages to thousands of people made comparison easy and obvious, the commission was constrained, like regulatory agencies, to use relatively uniform numbers; recall that a standard number was used for noneconomic damages. At the same time, arbitrariness was therefore limited—in the sense that people in similar circumstances received similar awards. Because the commission was directed to use tort principles, the numbers were not fully uniform, and a degree of individual variation was properly allowed. But the use of tort principles also made it impossible to use figures for hedonic losses, and instead the commission relied on flawed figures such as lost income, with the result that average awards—in the $2 to

[164] See Explanation of Process for Computing Presumed Economic Loss, available at http://www.usdoj.gov/victimcompensation/loss_calc_deceased.html.

[165] For example, the spouse of a 40 year old with an income of $50,000 would receive a little over $1 million, whereas the spouse of a 40 year old with an income of $225,000 would receive about $3.5 million – not including non-economic loss. See Explanation of Process for Computing Presumed Economic Loss, supra.

[166] See Chen, Man Behind, supra, at B3 ("The statute suffered from two conflicting impulses: to follow the standards of lost future income typical in tort cases, while at the same time making the fund fair to all income groups, Mr. Feinberg [the special master] said. He ultimately devised the program to prevent it from favoring the wealthy over the financially disadvantaged, he said.")

$3 million range—were less than the hedonic losses that actually occurred, according to the VSL methodology used by agencies.[167]

In normal situations, significant improvements are possible. Courts can, and ought to, take advantage of information about average persons when the relevant information about a particular victim is lacking (such as WTP to avoid the risk that produced death).[168] And although politics will always constrain agencies, there are certainly many steps that agencies can take to improve their use of VSLs without running afoul of political constraints. At a minimum, we see no reason why agencies cannot estimate the losses to dependents of people who are killed by regulated conduct, and it seems likely to us that at least some kinds of individualization will be possible—by, for example, giving a premium for risks that are especially dreaded.

Conclusion

In the United States, two independent bodies of law assign dollar values to deaths. Regulatory agencies, drawing on willingness to pay studies, use a uniform number that takes no account of losses to dependents and others. In wrongful death actions, courts attempt to compensate survivors, failing to incorporate the loss to the decedent and ensuring a high degree of variability in awards. For both bodies of law, deterrence is an important goal, and from the standpoint of deterrence, both make serious blunders. And for both, a key question is how to combine accuracy and administrability.

There are two central problems with regulatory law. First, the value of a statistical life is uniform rather than disaggregated. The very theory that underlies current practice calls for far more in the way of individuation. Second, agency figures do not include the losses to dependents and others; the result is underdeterrence. We have made suggestions about how agencies might remedy these two problems. The central problem with tort law is that it does not include the welfare loss to the decedent; its current reliance on the decedent's pre-death losses and the dependents' losses results in undervaluation of

[167] And, bizarrely, death benefits for soldiers and public safety officials as the basis for non-economic, that is, mental distress, compensation for the dependents of victims. See Explanation of Process for Computing Presumed Economic Loss, supra.
[168] Compare the proposal of Baldus et al., supra.

morality risks, and hence underdeterrence. We have also made suggestions about how both bodies of law should deal with the deaths of children and foreigners.

If our recommendations were accepted, we would expect tort awards to become higher, more uniform, and less arbitrary than they currently are. We would also expect VSLs used by regulatory agencies to be more variable—in many cases lower and in many cases higher. The inclusion of losses to dependents should result in more stringent regulations, as the effective benefit from a life saved would be increased.

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