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Decreasing the Risks Inherent in Claims for Increased Risk of Future Disease

David P. C. Ashton

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Decreasing the Risks Inherent in Claims for Increased Risk of Future Disease

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I. INTRODUCTION

Society is becoming increasingly aware of the health risks posed by many of the instrumentalities of modern living.¹ In this context, the legal system must decide whether an individual faced with an

1. The literature is replete with information concerning the increased risks of disease stemming from many modern activities. These risks exist whether one is at work, at home, or at play. A few examples will illustrate this point. *Newsweek* recently published an article warning of the health risks posed by the use of pesticides on fruit and vegetables and giving practical advice on how to minimize those health risks. Begley, Hager & Howard, *Dangers in the Vegetable Patch*, NEWSWEEK, Jan. 30, 1989, at 74, 74-75. The National Institute for Occupational Safety and Health (NIOSH) recently reported that welders are at a significantly increased risk of contracting lung cancer than the general population. NIOSH, *Criteria For a Recommended Standard: Welding Brazing, and Thermal Cutting*, 1988 NAT'L INST. OCCUPATIONAL SAFETY & HEALTH No. 88-110. In addition, numerous studies are suggesting a link between cancer and the extremely low frequency fields emitted by electrical power lines. Slesin, *Power Lines and Cancer: The Evidence Grows*, 90 TECH. REV., Oct. 1987, at 53. Even moderate alcohol consumption—as few as three drinks of beer or wine a week—is

increased risk of harm resulting from another's tortious conduct² may recover damages for that increased risk.³ In the absence of a present, measurable physical injury, courts are very reluctant to recognize a cause of action when a victim of toxic exposure seeks damages for an increased risk of disease.⁴ If, however, the enhanced risk is associated with an emotional injury or with a medically recognized need for periodic health checkups, many courts are willing to grant relief.⁵ Gener-

associated with an increased risk of breast cancer in women. Longnercker, *A Meta-Analysis of Alcohol Consumption in Relation to Risk of Breast Cancer*, 260 J. A.M.A. 652 (1988).

2. This Comment assumes without discussion that the victim will be able to establish that the wrongdoer was under a tort duty to the victim (whether in strict liability, negligence, or nuisance), that the wrongdoer breached that duty, and that the breach resulted in the victim's exposure to a toxic agent.

3. See, e.g., *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188 (6th Cir. 1988) (claim by residents living near a waste dump for increased risks of cancer and liver and kidney disease stemming from exposure to toxic agents that had leached into their well water); *Burns v. Jaquays Mining Corp.*, 156 Ariz. 375, 752 P.2d 28 (Ct. App. 1988) (suit by trailer park residents for increased risks of asbestos-related diseases arising out of exposure to asbestos waste improperly dumped at an adjacent landfill); *Minnesota ex rel. Woyke v. Tonka Corp.*, 420 N.W.2d 624 (Minn. Ct. App. 1988) (claim by a factory worker for increased risk of cancer due to his exposure to trichloroethylene (TCE), which had been improperly disposed of on his land); *Mauro v. Owens-Corning Fiberglas Corp.*, 225 N.J. Super. 196, 542 A.2d 16 (App. Div.) (action by an asbestos worker for an increased risk of contracting cancer as a result of repeated exposure to the manufacturer's asbestos-containing products), *cert. granted*, 113 N.J. 341, 550 A.2d 455 (1988); *Lavelle v. Owens-Corning Fiberglas Corp.*, 30 Ohio Misc. 2d 11, 507 N.E.2d 476 (C.P. Cayahoga County 1987) (action by an asbestos worker suffering from asbestosis for an increased risk of contracting malignant mesothelioma or other asbestos-induced cancer); *Sorenson v. Raymark Indus. Inc.*, 51 Wash. App. 954, 756 P.2d 740 (Ct. App. 1988) (action by shipyard worker for an increased risk of contracting lung cancer and mesothelioma stemming from exposure to asbestos).

4. See, e.g., *Schweitzer v. Consolidated Rail Corp.*, 758 F.2d 936 (3d Cir.) (Railroad workers' actions had not accrued before the consummation date of the railroad company's bankruptcy reorganization because subclinical injury resulting from exposure to asbestos is insufficient to constitute the identifiable, actual loss or damage to the workers' interests required to sustain a cause of action.), *cert. denied*, 474 U.S. 864 (1985); *Laswell v. Brown*, 683 F.2d 261 (8th Cir. 1982) (dismissing claim by children of an individual who died of cancer after being exposed to low-level, ionizing radiation because allegations of genetically transmitted cellular damage and exposure to an unusually high risk of disease cannot support a lawsuit for present injuries), *cert. denied sub nom. Laswell v. Weinberger*, 459 U.S. 1210 (1983); *Morrissy v. Eli Lilly & Co.*, 76 Ill. App. 3d 753, 756, 759-61, 394 N.E.2d 1369, 1372, 1374-76 (App. Ct. 1979) (The daughters of women who had taken Diethylstilbestrol (DES) during pregnancy were unable to maintain a class action because allegations of exposure to DES *in utero* and the existence of latent disease are an insufficient basis upon which to recognize a present injury.)

5. The cause of action for increased risk of future disease must be distinguished from causes of action for fear of future disease and for medical surveillance to detect future disease. The action for fear of future disease requires the victim to show that he reasonably is in fear of contracting the disease in the future, as a result of any increased risk of suffering the disease engendered by the toxic exposure. See, e.g., *Hagerty v. L & L Marine Servs., Inc.*, 788 F.2d 315, 317-19, *modified en banc*, 797 F.2d 256 (5th Cir. 1986). See generally Annotation, *Future Disease or Condition, or Anxiety Relating Thereto, as Element of Recovery*, 50 A.L.R. 4th 13

ally, a claim for enhanced risk of future disease will succeed only if the victim can prove he has suffered a present physical injury and the future disease is reasonably certain or reasonably probable to occur.⁶ In light of the current inchoate understanding of the etiology of can-

(1986). The action for medical surveillance to detect future disease, although not clearly defined, seems to require the victim to show that, as a result of any increased risk of disease caused by the toxic exposure, a physician reasonably could prescribe periodic medical surveillance to ensure early detection and treatment of the disease. *See, e.g.*, *Burns v. Jaquays Mining Corp.*, 156 Ariz. 375, 380-81, 752 P.2d 31, 33-34 (Ct. App. 1988); *Ayers v. Township of Jackson*, 106 N.J. 557, 599-607, 525 A.2d 287, 308-13 (1987). In contrast, the action for increased risk of future disease, in the majority of jurisdictions where it is recognized, requires the victim to demonstrate that the increased risk of disease is such that the disease is reasonably certain or reasonably probable to occur. *See infra* notes 90-91 and accompanying text.

6. *See, e.g.*, *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188 (6th Cir. 1988) (interpreting Tennessee law) (potential future disease not compensable unless reasonably certain to occur); *Deleski v. Raymark Indus. Inc.*, 819 F.2d 377, 380 (3d Cir. 1987) (both Pennsylvania and New Jersey law require present physical manifestation of illness before enhanced risk of disease is compensable); *Adams v. Johns-Manville Sales Corp.*, 783 F.2d 589 (5th Cir. 1986) (interpreting Louisiana law) (excluding evidence of potential cancer absent any showing that the risk of cancer had increased); *Jackson v. Johns-Manville Sales Corp.*, 781 F.2d 394 (5th Cir.) (interpreting Mississippi law) (allowing recovery for a greater than fifty-percent chance of future cancer because plaintiff had a present injury), *cert. denied*, 478 U.S. 1022 (1986); *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129 (5th Cir. 1985) (interpreting Texas law) (permitting recovery for future cancer because plaintiff had a present injury); *Brafford v. Susquehanna Corp.*, 586 F. Supp. 14 (D. Colo. 1984) (interpreting Colorado law) (factual allegations of cellular and subcellular damage satisfied the present injury requirement for an increased risk of cancer claim); *Burns v. Jaquays Mining Corp.*, 156 Ariz. 375, 752 P.2d 31 (Ct. App. 1988) (present, physical symptomatic injury necessary for recovery); *Morrissey v. Eli Lilly & Co.*, 76 Ill. App. 3d 753, 394 N.E.2d 1369 (App. Ct. 1979) (potential future damages not compensable unless reasonably certain to occur); *Pierce v. Johns-Manville Sales Corp.*, 296 Md. 656, 464 A.2d 1020 (1983) (damages may be recovered for a reasonable probability of acquiring cancer); *Minnesota ex rel. Woyke v. Tonka Corp.*, 420 N.W.2d 624 (Minn. Ct. App. 1988) (requiring present physical injury as a prerequisite to recovery for a prospective cancer); *Lorenc v. Chemirad Corp.*, 37 N.J. 56, 179 A.2d 401 (1962) (allowing recovery for a probability of cancer arising out of a chemical burn).

Some states have yet to address the issue of whether a victim exposed to a toxic agent can bring a claim for increased risk of future disease. *See, e.g.*, *Brusher v. Alternate Energy Resources, Inc.*, No. 86-RCCV-792 (Ga. Super. Ct.) (motion to dismiss pending), *noted in* 3 *Toxics L. Rep. (BNA)* 169 (July 6, 1988). One isolated case apparently takes the extreme position that a victim cannot bring a claim for increased risk of future disease, even though he has a present physical injury and a greater than fifty-percent chance of contracting the disease. *Eagle-Picher Indus., Inc. v. Cox*, 481 So. 2d 517 (Fla. 3d DCA 1985), *review denied*, 492 So. 2d 1331 (Fla. 1986).

cer⁷ and other insidious diseases,⁸ the cause of action for increased risk, as defined today, is nothing but a phantom remedy.

American courts are struggling to accommodate common law tort doctrines to the peculiar characteristics of toxic substance litigation. There is considerable debate among those involved in the day-to-day operation of the existing tort liability and litigation system about whether the present system is capable of dealing with personal injuries resulting from industrial processes and products.⁹ An evaluation of present approaches to the problem of increased risk of future disease reveals that this accommodation is failing.¹⁰ In large part, the

7. Dr. Joe W. Grisham, professor of pathology at the University of North Carolina School of Medicine, explained that, although the etiology of cancer is still unknown, theories of the viral and chemical origins of cancer are beginning to converge. Symposium, *Scientific Trends and Policy Formation in Human Toxic Risk Assessment* (Sept. 19, 1988) (at Stanford University), noted in 3 *Toxics L. Rep.* (BNA) 597-98 (Oct. 5, 1988). Researchers widely recognize three stages of cancer: initiation, promotion, and progression. *Id.* Moreover, there is growing evidence of a genetic component in the development of the disease, whether it stems from a viral or a chemical cause. *Id.* See also OSHA, Identification, Classification and Regulation of Potential Occupational Carcinogens, 29 C.F.R. § 1990.111 (1987) ("[T]he conclusive identification of 'carcinogens' is a complex matter 'on the frontiers of science'").

The recent case of *Ayers v. Township of Jackson*, 106 N.J. 557, 525 A.2d 287 (1987), highlighted the lack of understanding of the causative mechanisms of cancer. In *Ayers*, residents brought an action against their city pursuant to the New Jersey Tort Claims Act, claiming damages for increased risk of cancer arising out of the contamination of their well water by toxic agents from the city's landfill. *Id.* at 565-66, 525 A.2d at 291. The residents' expert toxicologist analogized the effect of exposure to carcinogens to a switch that, once turned on, affects genetic material and may or may not lead to cancer: "We don't understand scientifically yet the real biological steps throughout the whole chain, how exposure today to some agent initiates or starts a process which in 20, 30 years from now ultimately manifests itself or is seen as a cancer in an individual." *Id.* at 589 n.8, 525 A.2d at 303 n.8. See generally McElveen & Eddy, *Cancer and Toxic Substances: The Problem of Causation and the Use of Epidemiology*, PERS. INJ. DESKBOOK 198, 201-07 (1985) (discussing prevalent theories of cancer etiology) [hereinafter McElveen].

8. Insidious diseases are carcinogenic, mutagenic, or teratogenic conditions. W. LOWRANCE, OF ACCEPTABLE RISK: SCIENCE AND THE DETERMINATION OF SAFETY 26-27 (1976). A carcinogen is any cancer-producing substance. STEDMAN'S MEDICAL DICTIONARY 223 (24th ed. 1982) [hereinafter STEDMAN'S]. A mutagen is any agent that causes the production of a mutation. *Id.* at 912. A teratogen is any drug or agent that causes abnormal development. *Id.* at 1418. The word insidious denotes a disease that progresses with few or no symptoms to indicate its gravity. *Id.* at 714.

9. At the 1987 proceedings of The American Law Institute, Judge Gerald T. Wetherington emphasized that considerable disagreement has been generated concerning whether "the existing tort liability and litigation system for [handling enterprise personal injuries] is unduly costly and contentious; distributes compensation in an erratic and inconsistent fashion; and has contributed to the unavailability of affordable liability insurance and to the withdrawal of socially valuable products and services from the market." 64 A.L.I. PROC. 70 (1987) (quoting the PROGRESS REPORT ON COMPENSATION AND LIABILITY FOR PRODUCT AND PROCESS INJURIES 1 (1987)).

10. Commentators who have evaluated how well common law tort doctrines have been

problem has been how to adapt traditional tort rules to toxic exposure cases—cases involving fact scenarios that were wholly unforeseen when these rules were originally formulated.¹¹ The courts' most frequent adaptation of these traditional rules has been to allow a toxic exposure victim to split his cause of action and to postpone legal action on his future disease claim until the risk of future disease manifests itself as an actual disease.¹²

adapted to toxic substance litigation overwhelmingly conclude that the courts have failed. *Ayers*, 106 N.J. at 581, 525 A.2d at 299; see also Ginsberg & Weiss, *Common Law Liability for Toxic Torts: A Phantom Remedy*, 9 HOFSTRA L. REV. 859, 920-28 (1981) [hereinafter Ginsberg & Weiss]. A number of government bodies and numerous commentators have recommended that statutory compensation schemes be established to redress injuries sustained by chemical exposure victims. STAFF OF SENATE COMM. ON ENVTL. & PUB. WORKS, 97TH CONG., 2D SESS., INJURIES AND DAMAGES FROM HAZARDOUS WASTES—ANALYSIS AND IMPROVEMENT OF LEGAL REMEDIES 178-257 (Comm. Print 1982) (Superfund Section 301(e) Study Group) (recommending a two-tier system of remedies: a federal no-fault administrative compensation scheme for exposure victims buttressed by modified state tort remedies); Ginsberg & Weiss, *supra*, at 928-40; Trauberman, *Statutory Reform of Toxic Torts: Relieving Legal, Scientific and Economic Burdens on the Chemical Exposure Victim*, 7 HARV. ENVTL. L. REV. 177, 237-49 (1983) [hereinafter Trauberman]; Note, *The Inapplicability of Traditional Tort Analysis to Environmental Risks: The Example of Toxic Waste Pollution Victim Compensation*, 35 STAN. L. REV. 575, 612-16 (1983) [hereinafter *Pollution Victim Compensation*]; see also Rosenberg, *The Causal Connection in Mass Exposure Cases: A Public Law Vision of the Tort System*, 97 HARV. L. REV. 851, 905-24 (1984) (proposing that courts adopt "public law" measures such as class actions, damage scheduling, and insurance fund judgments to ameliorate the tort system's ability to process mass exposure cases) [hereinafter Rosenberg].

11. The inapplicability of traditional rules to toxic exposure cases is illustrated by *Martinez-Ferrer v. Richardson-Merrell, Inc.*, 105 Cal. App. 3d 316, 164 Cal. Rptr. 591 (Ct. App. 1980). In *Martinez-Ferrer*, the victim suffered retinal swelling after ingesting the anti-cholesterol drug MER/29 in 1960. *Id.* at 319, 164 Cal. Rptr. at 592. Sixteen years later, in 1976, the victim developed cataracts. *Id.* His doctor concluded that the cataracts had been caused by the earlier ingestion of MER/29. *Id.* The victim immediately filed suit against the manufacturer of MER/29 claiming damages for the cataract injury. *Id.* at 320, 164 Cal. Rptr. at 593. The trial court held the action statute-barred on the ground that the single cause of action rule mandated that the victim bring but one action against the manufacturer for all past, present, and prospective harm. *Id.* The trial court concluded that this cause of action accrued in 1960, when the ingestion of MER/29 resulted in retinal swelling, and became statute-barred one year later. *Id.* This approach required the victim, in 1960, to foresee his chances of developing cataracts in 1976. The California Court of Appeal reversed, declaring: "The simple fact is that rules developed against the relatively unsophisticated backdrops of barroom brawls, intersection collisions and slips and falls lose some of their relevance in these days of miracle drugs with their wondrous, unintended, unanticipated and frequently long-delayed side effects." *Id.* at 324, 164 Cal. Rptr. at 595.

12. See, e.g., *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 119-20 (D.C. Cir. 1982) (interpreting District of Columbia law); *Burns v. Jaquays Mining Corp.*, 156 Ariz. 375, 752 P.2d 28, 31 (Ct. App. 1988); *Ayers v. Township of Jackson*, 106 N.J. 557, 584, 525 A.2d 289, 300 (1987). In *Ayers*, the New Jersey Supreme Court succinctly described the adaptation of the single cause of action rule:

[W]e concur with the principle that . . . neither the statute of limitations nor the single controversy rule should bar timely causes of action in toxic-tort cases

Such tinkering with traditional tort rules is not a viable alternative to the outright acceptance of an immediate cause of action for a medically proven increased risk of future disease. Contrary to the assertion of some courts,¹³ the tort goals of deterrence and fair compensation, evidentiary considerations regarding proof of causation, and public policy concerns for judicial economy are not advanced by the current judicial approaches to claims of increased risk of future disease.

This Comment addresses the pressing need to provide victims of toxic exposure present, adequate remedies that, at the same time, further the basic goals of tort law. Section II describes current judicial approaches to increased risk of future disease claims. Section III then demonstrates how prevailing judicial attitudes effectively prevent recovery for increased risk by toxic exposure victims. In addition, Section IV explains how the courts, operating within the present tort liability and litigation system, can recognize significantly increased risk of future disease as a claim upon which relief can be granted. This claim would be subject to a judicially imposed remedy of insurance coverage for the risk of future disease to which the victim has been exposed. Finally, Section V concludes that in the light of the inchoate understanding of the disease processes engendered by toxic exposures, the insurance coverage remedy represents a better way to handle increased risk of disease claims.

II. CURRENT JUDICIAL ATTITUDES TOWARD INCREASED RISK OF FUTURE DISEASE CLAIMS

A. *Three Problematic Traditional Rules*

Three traditional rules have created particular difficulty for courts that have addressed claims for increased risk of future disease: the rule against splitting a cause of action, the rule of statutory limitation of tort actions, and the all-or-nothing rule of damages. Courts have often disposed of these claims by referring to one or more of

instituted after discovery of a disease or injury related to tortious conduct, although there has been prior litigation between the parties of different claims based on the same tortious conduct.

Id.

13. See, e.g., *Wilson*, 684 F.2d at 118-20 (tort goal of fair compensation and evidentiary concerns regarding causation advanced by current judicial approaches to increased risk claims); *Anderson v. W.R. Grace & Co.*, 628 F. Supp. 1219, 1232 (D. Mass. 1986) (interpreting Massachusetts law) (tort goal of fair compensation advanced by current judicial approaches to increased risk claims); *Eagle-Picher Indus. Inc. v. Cox*, 481 So. 2d 517, 521-26 (Fla. 3d DCA 1985) (tort goals of finality and judicial economy advanced by current judicial approaches to increased risk claims), *review denied*, 492 So. 2d 1331 (Fla. 1986).

these rules without careful consideration of whether application of the rule is appropriate to this type of claim.

The rule against splitting a cause of action¹⁴ mandates that a victim may bring only one action for the recovery of all damages resulting from a single wrongful act, irrespective of whether such damages are past, present, or prospective.¹⁵ Failure to include all related claims against the wrongdoer in one action precludes the maintenance of a second action based on unlitigated but related claims.¹⁶

The statutory limitation rule requires a victim to bring a tort action to enforce his rights to compensation within a certain time, or lose his right to enforce them.¹⁷ The extent to which statutes of limitation pose procedural obstacles to toxic tort litigation varies widely, depending upon the jurisdiction.¹⁸ If the limitation period is calculated from the moment of exposure, toxic exposure victims often discover their injury—and consequently their right to sue someone for damages—after the limitation period has run because of the insidious nature¹⁹ of diseases engendered by toxic agents.²⁰ Most jurisdictions

14. The rule is also known as the single controversy rule or the rule of merger. *See, e.g., Martinez-Ferrer*, 105 Cal. App. 3d at 324 n.7, 164 Cal. Rptr. at 595 n.7; *Ayers*, 106 N.J. at 583, 525 A.2d at 300.

15. The purpose of the rule against claim-splitting is to ensure that a victim will not have more than one opportunity to litigate the same matter. *See Brafford v. Susquehanna Corp.*, 586 F. Supp. 14, 18 (D. Colo. 1984) (interpreting Colorado law) (The single cause of action rule is designed to ensure "plaintiff will not get a second bite of the apple.").

16. The Restatement (Second) of Torts states: "One injured by the tort of another is entitled to recover damages from the other for all harm, past, present and prospective, legally caused by the tort." RESTATEMENT (SECOND) OF TORTS § 910 (1977). Comment d states:

If an injured person fails to include in a suit all the elements of harm for which he could have obtained damages and obtains a judgment based only upon some of them, he is ordinarily not entitled to maintain a later action for the remaining elements of harm, since his right is merged in the judgment.

RESTATEMENT (SECOND) OF TORTS § 910 comment d (1977).

The Restatement (Second) of Judgments lists six exceptions to the rule against claim-splitting. RESTATEMENT (SECOND) OF JUDGMENTS § 26 (1976). Subsections 26(b) and 26(f) are most relevant to toxic tort litigation. *Id.* §§ 26(b), 26(f). Under subsection 26(b), a second action may be maintained if the plaintiff's right to do so has been expressly reserved in the first action. *Id.* § 26(b). Under subsection 26(f), the plaintiff may bring a second action if he can show, by clear and convincing evidence, that the policies favoring preclusion of a second action are overcome for an extraordinary reason. *Id.* § 26(f).

17. The purpose of a statute of limitation is to encourage plaintiffs to act diligently upon their rights and to protect defendants from claims based on events that have receded into the past, or that have been fraudulently concocted. *See Larson v. Johns-Manville Corp.*, 427 Mich. 301, 310-11, 399 N.W.2d 1, 5 (1986).

18. *See Ginsberg & Weiss, supra* note 10, at 921 n.259; *see also* Note, *Developments in the Law—Toxic Waste Litigation*, 99 HARV. L. REV. 1458, 1606-07 (1986) (discussing the application of various state statutes of limitation to toxic-tort actions).

19. *See supra* note 8.

20. *See, e.g., Steinhardt v. Johns-Manville Corp.*, 54 N.Y.2d 1008, 1010-11, 430 N.E.2d

have taken steps to remedy this unfairness by adopting one of several variations of a "discovery" rule that tolls the limitation period until a victim discovers the injury or should reasonably have discovered it.²¹ "Discovery" rules, in turn, have created peculiarly difficult problems for victims who have attempted to establish causation between a present injury and a tortious act that occurred many years earlier.

Under the all-or-nothing rule of damages,²² if the victim proves his past, present, or prospective harm to the appropriate standard of proof,²³ that harm will be treated, for the purpose of valuation, as a certainty. On the other hand, if the harm cannot be proved to the appropriate standard of proof, it will be treated as nonexistent. Hence, depending upon whether one can satisfy the standard of proof, one recovers all or nothing.²⁴

1297, 1298-99 (1981) (Asbestos workers' actions to recover damages for asbestosis filed more than four years after their last exposure to asbestos dust were time-barred because the four-year limitation period began to run at the time asbestos particles invaded the workers' lungs.).

21. *Ayers v. Township of Jackson*, 106 N.J. 557, 582, 525 A.2d 289, 299 (1987). In 1986, Congress preempted state statutes of limitation with a discovery rule whenever a victim is exposed to "any hazardous substance, or pollutant or contaminant, released into the environment from a facility." Comprehensive Environmental Response, Compensation, and Liability Act, § 309(a) (codified at 42 U.S.C.A. § 9658 (West Supp. 1988)). Within this narrow factual context, the controlling commencement date for the running of state statutes of limitation becomes the date the victim "knew (or reasonably should have known) that the personal injury . . . [was] caused or contributed to by the hazardous substance or pollutant or contaminant concerned." *Id.* at § 309(b)(4)(A) (codified at 42 U.S.C.A. § 9658(b)(4)(A)).

22. See C.T. MCCORMICK, HANDBOOK ON THE LAW OF DAMAGES 119 (1935); McCormick, *The Standard of Certainty in the Measure of Damages*, 43 YALE L.J. 1108, 1128 (1934).

23. For a discussion of the standard of proof to which evidence of an increased risk of future disease must conform, see *infra* notes 83-157 and accompanying text.

24. The potential unfairness of applying the all-or-nothing approach to claims for future harm generally and to claims regarding insidious diseases in particular is well-documented. See Cooper, *Assessing Possibilities in Damage Awards—The Loss of a Chance or the Chance of a Loss*, 37 SASKATCHEWAN L. REV. 193, 215-25 (1973) [hereinafter Cooper] (examining the unfairness of the American all-or-nothing approach to damages and advocating the adoption of the English simple-probability approach); King, *Causation, Valuation, and Chance in Personal Injury Torts Involving Preexisting Conditions and Future Consequences*, 90 YALE L.J. 1353, 1376-87 (1981) (criticizing the all-or-nothing approach and proposing that losing a chance to achieve a favorable outcome, such as avoiding death because of a physician's misdiagnosis, or losing a chance to avoid an adverse consequence, such as avoiding future blindness, should be compensable and that the amount of recovery should be valued by reference to the percentage probability of the chance occurring); Rosenberg, *supra* note 10, at 862-66 (examining the economic inefficiency of all-or-nothing awards in toxic substance litigation and suggesting that the solution lies in awarding a partial or proportional recovery—namely, total damages multiplied by the probability of causation).

To date, American courts have rejected the proportional recovery approach in the context of claims for increased risk of future disease. See, e.g., *Herber v. Johns-Manville Corp.*, 785 F.2d 79 (3d Cir. 1986) (interpreting New Jersey law) (an asbestos worker subject to an increased risk of cancer argued unsuccessfully that he should be allowed to recover damages

B. *Application of the Rules to Increased Risk Claims*

The various ways in which courts have handled claims for increased risk of future disease is best illustrated by a hypothetical.²⁵ The victim has worked for a number of years with products containing asbestos. Medical evidence indicates that his exposure to asbestos has resulted in a present injury—thickening of the lung tissue. The victim does not suffer presently from any cancerous condition. Epidemiological studies, however, indicate that he is in a category of asbestos workers who have a forty-three percent risk of developing lung cancer due to their exposure to asbestos. The issue is as follows: At what stage in the evolution of the victim's toxic injury should tort law intercede by requiring the wrongdoer to compensate the victim?

At the outset, it must be stated that most courts allow recovery when the toxic exposure victim can prove, by a preponderance of the evidence: that he has suffered present physical injury; or that he has suffered reasonable fear as a result of the increased risk of future disease; or that he must undergo periodic medical surveillance to detect the onset of the possible future disease.²⁶ Applied to the hypothetical, the asbestos worker would be permitted to recover damages for the

equal to the amount he would have received had he contracted asbestos-related cancer, reduced proportionately by the probability that he will not suffer the disease).

25. The case of *Pollock v. Johns-Manville Sales Corp.*, 686 F. Supp. 489 (D.N.J. 1988), provides the basis for the hypothetical used in the text. In *Pollock*, the asbestos manufacturers moved to exclude from trial any medical testimony on the asbestos worker's claim for increased risk of cancer. *Id.* at 489. In opposition to the motion, the asbestos worker contended that he was prepared to adduce medical testimony to establish "that his risk of cancer was: (1) caused by a diagnosed medical injury [thickening of lung tissue], and (2) definable medically and scientifically as having a 43 percent statistical probability of occurring in the future." *Id.* at 490. The district court excluded the medical testimony, ruling that a quantified risk of cancer of only forty-three percent did not meet the standard of proof—showing the risk to be more probable than not. *Id.* at 492. Noting that thickening of lung tissue is a separate and distinct disease process from cancer, and the extraordinary nature of asbestos exposure litigation, the district court specifically recognized the asbestos worker's "right to sue in the future should the increased risk created by the exposure to asbestos come to fruition." *Id.* at 492 & n.4.

26. See, e.g., *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188 (6th Cir. 1988) (interpreting Tennessee law) (landowners exposed to toxic agents in their well water entitled to recover damages for kidney and liver damage, central nervous system injuries, emotional distress arising from their 25-30% increased risk of cancer, and medical monitoring costs for the early detection of any cancer); *Hagerty v. L & L Marine Servs., Inc.*, 788 F.2d 315 (interpreting Louisiana law) (seaman drenched with toxic dripolene entitled to damages for his fear of future cancer and for the reasonable cost of medical checkups for cancer), *modified en banc*, 797 F.2d 256 (5th Cir. 1986); *Ayers v. Township of Jackson*, 106 N.J. 557, 525 A.2d 289 (1987) (residents whose water supply was contaminated by chlorinated hydrocarbons leaching from the town's landfill entitled to recover damages for emotional distress resulting from their knowledge of having an unquantifiable increased risk of future diseases and for medical surveillance for the early detection of such future diseases.)

thickening of his lung tissue. Whether he could recover for fear of cancer would depend on whether he had manifested reasonable fear based on his forty-three percent enhanced risk of lung cancer. Similarly, whether he could recover medical surveillance costs would depend on whether a physician reasonably could prescribe medical monitoring for the early detection of cancer based on the forty-three percent enhanced risk.

1. STRICT APPLICATION OF THE SINGLE CAUSE OF ACTION RULE

When faced with the scenario described in the hypothetical, courts have adopted one of three solutions to the problem of increased risk claims.²⁷ The first solution is to apply strictly the rule against splitting a cause of action.²⁸ This rule mandates that, once the tortious conduct has resulted in the invasion of one of the victim's legally protected interests and has produced a physical effect, then the victim's cause of action accrues, and he must bring an action within the applicable statute of limitation period for all past, present, and prospective harm legally caused by the tortious conduct.²⁹ If the victim fails to make a claim for all the elements of harm for which he could have obtained damages, and the court awards damages to him for only some of those elements, then ordinarily he will be barred from maintaining a later action for the remaining elements of harm.³⁰

Governed by this rule, the asbestos worker in the hypothetical is presented with an impossible dilemma.³¹ His cause of action accrues when the exposure to asbestos fibers manifests itself as thickening of

27. See D. DOBBS, R. KEETON, D. OWEN & W. KEETON, PROSSER & KEETON ON THE LAW OF TORTS § 30, at 26 (5th ed. Supp. 1988) [hereinafter PROSSER & KEETON].

28. See, e.g., *Dartez v. Fibreboard Corp.*, 765 F.2d 456 (5th Cir. 1985) (interpreting Texas law). In *Dartez*, an insulation worker, suffering no present physical effect from exposure to asbestos, brought an action for fear of contracting cancer and increased risk of cancer. *Id.* at 460, 466. The insulator adduced evidence that from approximately 35% to 60% of insulators diagnosed with asbestosis die from lung cancer and that his risk of cancer was only approaching 50%. *Id.* at 466-67. The United States Court of Appeals for the Fifth Circuit held that the single cause of action rule required the insulator to bring one action for all potential damages arising out of the tortious conduct, but ruled that he could not recover for increased risk of cancer because he had failed to establish a reasonable medical probability of future asbestos-related cancer. *Id.*

29. See *supra* notes 14-16 and accompanying text.

30. See *supra* notes 14-16 and accompanying text.

31. The plaintiff insulation worker in *Dartez* faced the dilemma of either trying to prove his claim for increased risk of cancer at the time he had to claim for present physical injuries and fear of cancer arising from his exposure to asbestos fibers or having the claim barred by the single cause of action rule. The insulator's cause of action accrued when the inhalation of asbestos fibers resulted in a fear of contracting cancer. 765 F.2d at 468. Yet the insulator was unable to introduce sufficient evidence to establish the reasonable medical probability of future asbestos-related cancer and consequently his increased risk went uncompensated. *Id.* at 466-

the lungs. If he sues immediately, he will lose his claim for future disease because a forty-three percent risk will not satisfy the appropriate standard of proof.³² If, however, he waits for the insidious disease to become manifest, the statute of limitation will be running against him and therefore eventually may bar his right of action.

2. RELAXATION OF THE SINGLE CAUSE OF ACTION RULE

A majority of courts have adopted a second solution to the problem of increased risk claims.³³ These courts have held that the rule against splitting a cause of action is simply inapplicable when the same toxic exposure results in a present injury and a risk of future injury, both of separate and distinct etiologies.³⁴ Consequently, the

67. Were Dartez subsequently to contract an asbestos-related cancer, the single cause of action rule would preclude any action against those responsible.

There are only three gambits a victim suffering from a 50% or lesser risk of future disease may use to recover in a jurisdiction that adheres strictly to the single cause of action rule. He may couch his claim in terms of a fear of future cancer, or a need for medical surveillance. See *supra* note 5. Alternatively, he may phrase his claim in terms of a present injury—such as pleural thickening—with a potential for further complications—for example, lung cancer. See *infra* notes 37-43 and accompanying text.

32. For a discussion of the appropriate standard of proof to which prospective damages must be established see *infra* notes 83-157 and accompanying text.

33. See, e.g., *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 118-20 (D.C. Cir. 1982) (interpreting District of Columbia law); *Anderson v. W.R. Grace & Co.*, 628 F. Supp. 1219, 1231-32 (D. Mass. 1986) (interpreting Massachusetts law); *Martinez-Ferrer v. Richardson-Merrell, Inc.*, 105 Cal. App. 3d 316, 324-27 & n.7, 164 Cal. Rptr. 591, 595-97 & n.7 (Ct. App. 1980); *Eagle-Picher Indus., Inc. v. Cox*, 481 So. 2d 517, 521-26 (Fla. 3d DCA 1985), *review denied*, 492 So. 2d 1331 (Fla. 1986); *Larson v. Johns-Manville Sales Corp.*, 427 Mich. 301, 317-19, 399 N.W.2d 1, 8-9 (1986); *Mauro v. Owens-Corning Fiberglas Corp.*, 225 N.J. Super. 196, 203, 542 A.2d 16, 20 (App. Div.), *cert. granted*, 113 N.J. 341, 550 A.2d 455 (1988).

The policy reasons purportedly justifying two separate tort actions for toxic exposure cases resulting in enhanced risks of insidious disease are that evidence regarding key issues in an insidious disease case tends to develop rather than disappear as time passes, that the victim should receive adequate compensation but that the injurer should pay no more than what is deemed adequate, and that victims should not be encouraged to file speculative anticipatory lawsuits. *Wilson*, 684 F.2d at 118-20.

34. Despite the courts' verbal gymnastics, permitting an immediate action for present injury and a future action should the insidious disease ever occur should be recognized for what it is—a split cause of action. It is instructive to compare the case of *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129 (5th Cir. 1985) (interpreting Texas law) with *Devlin v. Johns-Manville Corp.*, 202 N.J. Super. 556, 495 A.2d 495 (Super. Ct. Law Div. 1985). In *Gideon*, an insulation warehouseman claimed damages for asbestosis and for a greater than fifty-percent probability of sustaining malignant mesothelioma in the future, due to exposure to asbestos fibers. 761 F.2d at 1138. In upholding *Gideon's* recovery, the United States Court of Appeals for the Fifth Circuit declared that, once some injury occurs, in this case asbestosis, a victim has one cause of action for all past, present, or prospective damage caused by the single, legal wrong. *Id.* at 1136. The Fifth Circuit emphasized that "[t]he cause of action 'inheres in the causative aspects of a breach of a legal duty, the wrongful act itself, and not in the various forms of harm which result therefrom.'" *Id.* at 1137 (quoting Annotation, *Simultaneous*

toxic exposure victim has two independent tort actions—one for the present injury and one that does not accrue until the latent disease occurs. Although this solution attempts to minimize speculation as to unpredictable future events, it does so at great cost to the tort goals³⁵ of deterrence and fair compensation.³⁶ Applying the claim-splitting approach to the above hypothetical results in the asbestos worker having an immediate right of action regarding the thickening of his lungs, but having an inchoate right of action regarding the lung cancer, which will mature once the cancer manifests itself.

3. LIBERALIZATION OF THE STANDARDS OF PROOF

The third solution to the problem of increased risk claims involves the liberalization of standards of proof whenever the victim is suffering from a present injury that has the potential for further complications. If the victim can demonstrate such a present injury, he may recover damages for any substantial chance of future harm.³⁷

Injury to Person and Property As Giving Rise to Single Cause of Action—Modern Cases, 24 A.L.R.4TH 646, 650 (1983)).

In *Devlin*, truck drivers brought suit based on their asbestosis, their unquantified risk of dying from cancer, and their fear of contracting cancer. 202 N.J. Super. at 556-57, 495 A.2d at 495-96. The Superior Court of New Jersey held that, because asbestosis and asbestos-related cancer are separate and distinct disease processes, an action for cancer would only accrue upon its manifestation. *Id.* at 565, 495 A.2d at 500. The New Jersey court's distinction seems to rest upon the difference between the "various forms of harm which result [from the wrongful act itself]." *Gideon*, 761 F.2d at 1137 (quoting 24 A.L.R.4TH 646, 650). The rule in *Gideon*, however, implies that such a distinction constitutes unlawful claim-splitting. In contrast, the *Devlin* court opined: "[T]he facts before this court do not truly implicate the entire controversy doctrine." 202 N.J. Super. at 565, 495 A.2d at 502.

35. The major purposes of the law of torts are as follows:

- (1) to provide a peaceful means for adjusting the rights of parties who might otherwise 'take the law into their own hands';
- (2) to deter wrongful conduct;
- (3) to encourage socially responsible behavior; and,
- (4) to restore injured parties to their original condition, insofar as the law can do this, by compensating them for their injury.

W. PROSSER, J. WADE & V. SCHWARTZ, *CASES AND MATERIALS ON TORTS* 1 (8th ed. 1988). For a different perspective on the purpose of tort law, see RESEARCH STAFF OF THE ACADEMIC TASK FORCE FOR REVIEW OF THE INSURANCE AND TORT SYSTEMS, *TORT REFORM ALTERNATIVES* 1, 4 (1987) (discussion draft—prepared for the Academic Task Force to assist them in making recommendations to the Florida Legislature—urging that the tort system is best understood as a conflict resolution system, meant to define the civil limits of harmful behavior).

36. For a discussion of the reasons why the tort goals of deterrence and fair compensation are not served by the split cause of action, see *supra* notes 184-96 and accompanying text.

37. See, e.g., *Starlings v. Ski Roundtop Corp.*, 493 F. Supp. 507, 510 (M.D. Pa. 1980) (interpreting Pennsylvania law) (plaintiff recovered damages for a traumatic knee injury and an increased risk of arthritis, even though plaintiff's doctors described the increased risk of arthritis as an unquantified possibility); *Feist v. Sears, Roebuck & Co.*, 267 Or. 402, 412-13, 517 P.2d 675, 677, 680 (1973) (holding that physicians' testimony that there was a reasonable

Underpinning this relaxed standard of proof regarding the extent of the injury³⁸ is the policy that it is unfair to deny a victim some recompense for increased risks when all the damages resulting from an injury must be claimed in one cause of action.³⁹

In order for the hypothetical asbestos worker⁴⁰ to bring his action within this third solution, he would have to prove, to a reasonable probability, that his exposure to asbestos fibers caused present immunologic damage. A medical expert would have to testify as to the existence and causation of such an injury to a reasonable degree of medical certainty.⁴¹ It then could be argued that assessing the increased risk of lung cancer is simply part of evaluating the extent of the existing injury. Whether a court would accept such an analysis would depend on the degree of medical understanding of how asbestos fibers render the lungs susceptible to cancer⁴² and the willingness of the court to countenance a broad definition of present injury.⁴³

medical probability that a child who was struck on the head by a falling cash register had an increased susceptibility to meningitis was not speculative and provided a sufficient basis for a jury finding of disability); *Schwegel v. Goldberg*, 209 Pa. Super. 280, 287-88, 228 A.2d 405, 409 (Super. Ct. 1967) (admitting testimony that the possibility of a head-injury victim developing epileptic seizures was enhanced by the head-injury).

38. Before the relaxed standard of proof for the extent of the injury can be applied, the victim must prove, on a balance of probabilities, that he suffered a presently ascertainable injury as a result of the wrongdoer's tortious conduct. See *Feist*, 267 Or. at 407, 517 P.2d at 677; *Schwegel*, 209 Pa. Super. at 284, 228 A.2d at 409. The court is allowed to consider mere possibilities only when assessing the extent of an existing disability. *Feist*, 267 Or. at 409-10, 517 P.2d at 678-79; *Schwegel*, 209 Pa. Super. at 287-88, 228 A.2d at 409.

39. See *supra* note 37. In *Feist*, the Supreme Court of Oregon declared it would be unfair to hold the evidence of possible meningitis inadmissible, since an action for all damages arising from the blow to the head had to be brought within the statutory limitations period. 267 Or. at 410, 517 P.2d at 678-79.

40. See *supra* note 25 and accompanying text.

41. For an explanation of the proper meaning of an opinion expressed to a reasonable degree of medical certainty, see *infra* notes 124-25 and accompanying text.

42. Exactly how asbestos fibers affect the body so as to create a cancer is not known. See *Lavelle v. Owens-Corning Fiberglas Corp.*, 30 Ohio Misc. 2d 11, 12 & n.4, 507 N.E.2d 476, 477 & n.4 (C.P. Cayahoga County 1987); see generally B. CASTLEMAN, *ASBESTOS: MEDICAL AND LEGAL ASPECTS* 39-122 (2d ed. 1986) (an excellent source of information about the current understanding of the relationship between asbestos and cancer). Despite the expenditure of billions of dollars on research, neither the causes of cancer in humans nor the mechanisms by which cancer develops are known. Scientists do know, however, that individuals exposed to certain substances appear to develop cancer more frequently than those not exposed. McElveen, *supra* note 7, at 199, 206-07. The present state of knowledge regarding cancer causation does not facilitate the sort of inquiry necessary to categorize a toxic exposure injury as a present injury containing the potential for further complications.

43. To date, the extent of the injury rule has been applied only to gross physical injuries. See Note, *Increased Risk of Disease from Hazardous Waste: A Proposal For Judicial Relief*, 60 WASH. L. REV. 635, 640 (1985) [hereinafter Note, *Judicial Relief*]; see, e.g., *Starlings v. Ski Roundtop Corp.*, 493 F. Supp. 507, 510 (M.D. Pa. 1980) (interpreting Pennsylvania law) (traumatic knee injury resulting in enhanced risk of arthritis); *McCall v. United States*, 206 F.

None of the three approaches adopted by American courts to deal with increased risk of future disease claims have provided an effective remedy for victims of toxic exposure. Traditional tort rules have not worked well in the context of toxic substance litigation because they were formulated in an age when nobody could foresee the type and variety of insidious diseases to which society would be exposed in the twentieth century. All three present approaches have failed to solve the problems created by the inherently speculative nature of the increased risk claim, while still advancing the dual tort goals of fair compensation and deterrence.

III. THE INADEQUACIES OF CURRENT JUDICIAL ATTITUDES TOWARD INCREASED RISK OF FUTURE DISEASE CLAIMS

Neither those courts allowing a present action for the increased risk of future disease nor those courts allowing the action to be postponed until the insidious disease becomes manifest have addressed the option of allowing an action for an increased risk of future disease and, when the action is successful, granting equitable relief narrowly tailored to the nature of the claim.⁴⁴ Yet many of the difficulties surrounding increased risk claims result from the relief presently avail-

Supp. 421, 426 (E.D. Va. 1962) (interpreting Virginia law) (head-injury resulting in increased risk of epilepsy); *Feist v. Sears, Roebuck & Co.*, 267 Or. 402, 410, 517 P.2d 675, 679 (1973) (skull fracture resulting in increased susceptibility to meningitis); *Schwegel v. Goldberg*, 209 Pa. Super. 280, 283, 228 A.2d 405, 408 (Super. Ct. 1967) (skull fracture resulting in increased susceptibility to meningitis). Attempts to transplant the rule to nontraumatic injuries have not met with success. *See, e.g., Sterling v. Velsicol Chem. Corp.*, 647 F. Supp. 303, 322 (W.D. Tenn. 1986), *rev'd*, 855 F.2d 1188, 1204-05 (6th Cir. 1988) (interpreting Tennessee law) (reversing district court's holding that a 25-30% enhanced susceptibility to disease established to a reasonable degree of medical certainty was a present condition on the ground that the victims failed to prove to a reasonable degree of medical certainty that the disease would more likely than not occur).

44. For a discussion of the nature of an appropriate equitable remedy, see *infra* notes 204-14 and accompanying text. Every court addressing the issue of increased risk of disease has discussed it in the context of the damages remedy. *See, e.g., Sterling*, 855 F.2d at 1204 ("While it is unnecessary that the medical evidence conclusively establish with absolute certainty that the future disease or condition will occur, mere conjecture or even possibility does not justify the court awarding damages for a future disability which may never materialize."); *Hagerty v. L & L Marine Servs., Inc.*, 788 F.2d 315, 320 (5th Cir.) (interpreting Louisiana law) ("Even when there is evidence that the increased risk of cancer exceeds fifty percent, the rule does not work well. A plaintiff, if suffering any injury, is forced to seek cancer damages although the extent of those damages is yet highly speculative."), *modified en banc*, 797 F.2d 256 (1986); *Ayers v. Township of Jackson*, 106 N.J. 557, 597, 525 A.2d 287, 307 (1987) ("A holding that recognizes a cause of action for unquantified enhanced risk claims . . . imposes on judges and juries the burden of assessing damages for the risk of potential disease, without clear guidelines to determine what level of compensation may be appropriate.").

able for such claims: all-or-nothing damages.⁴⁵

A. *All-or-Nothing Damages and the Single Cause of Action Rule*

In jurisdictions that strictly apply the single cause of action rule,⁴⁶ a toxic exposure victim is permitted to bring an action for an increased risk of future disease. In order to recover on this action, the victim must prove that the toxic exposure has caused a present physical injury and that the future disease will more likely than not occur as a result of that toxic exposure.⁴⁷ Once the occurrence of the future disease is established to the appropriate standard of proof, the all-or-nothing damages rule ensures that the increased risk claim is valued as if the future disease were a certainty.⁴⁸

The propensity of the single cause of action rule and the all-or-nothing damages rule to overcompensate or undercompensate increased risk claimants has been well-documented.⁴⁹ The case of

45. For a discussion of the meaning of the all-or-nothing damages rule, see *supra* notes 22-24 and accompanying text.

46. See, e.g., *Dartez v. Fibreboard Corp.*, 765 F.2d 456, 466-67 (5th Cir. 1985) (interpreting Texas law).

47. See, e.g., *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1136-37 (5th Cir. 1985) (interpreting Texas law). In *Gideon*, the plaintiff, an insulation warehouseman who handled asbestos products daily, brought an action against seventeen asbestos manufacturers claiming damages for a present injury of asbestosis and for a significantly increased risk of contracting mesothelioma or some other asbestos-related cancer. *Id.* at 1134. The United States Court of Appeals for the Fifth Circuit applied the rule that, once some injury results from a single legal wrong, the victim's cause of action accrues, and he must seek damages for *all* his injuries in one suit. *Id.* at 1136-37. In such a suit, a claim for future damages must be proved by a preponderance of the evidence to be more likely to occur than not. *Id.* at 1137-38. The court held that the plaintiff's cause of action accrued when asbestos fibers invaded his lungs and resulted in pleural thickening, plaques, calcification, and asbestosis. *Id.* at 1137. In addition, the court held that expert testimony, within reasonable medical probability, that the plaintiff would die of an asbestos-related cancer and that he had a greater than fifty-percent risk was sufficient to support a jury verdict for the plaintiff on the increased risk claim. *Id.* at 1137-38.

48. See *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 119 (D.C. Cir. 1982) (interpreting District of Columbia law); King, *supra* note 24, at 1363.

49. See, e.g., *Hagerty v. L & L Marine Servs., Inc.*, 788 F.2d 315, 320 (5th Cir.) (interpreting Louisiana law) (Even if the victim can adduce evidence of a greater than fifty-percent increased risk of cancer, he is still forced to seek cancer damages at a time when the extent of those damages is highly speculative—the disease may never occur, it may be of limited extent, or the suffering and expenses may be enormous.), *modified en banc*, 797 F.2d 256 (1986); *Wilson*, 684 F.2d at 120 & n.45 (D.C. Cir. 1982) (interpreting District of Columbia law) (The need to secure fair compensation for serious harm and thus the need to avoid windfall recoveries and undercompensation weighs in favor of splitting the cause of action to permit a later action for any asbestos-related cancer.); *Eagle-Picher Indus., Inc. v. Cox*, 481 So. 2d 517, 524 (Fla. 3d DCA 1985) (The speculation involved in predicting future damages may lead to several inequitable results: the plaintiff who does not contract cancer may receive a windfall, the unsuccessful plaintiff who subsequently develops cancer may have no relief, or the successful plaintiff who later contracts cancer may have inadequate damages because, in

Jackson v. Johns-Manville Sales Corp.,⁵⁰ for example, illustrates this trait very well. In *Jackson*, the plaintiff, a shipyard worker who worked around asbestos dust for almost twenty years, developed breathing problems, which were diagnosed as asbestosis.⁵¹ As a result, he filed suit and claimed damages, inter alia, for a "susceptibility to increased risks of infections and malignancies."⁵² At trial, three expert witnesses testified that, based on statistical risks adduced from epidemiological studies⁵³ and on the plaintiff's medical records, the plaintiff had a greater than fifty-percent chance of contracting an asbestos-related cancer in the future.⁵⁴ In an en banc opinion, the United States Court of Appeals for the Fifth Circuit, interpreting Mississippi law, held that the plaintiff was entitled to recover for the future cancer because the testimony established that he probably would contract cancer sometime in the future.⁵⁵ The Fifth Circuit strictly applied the rule against splitting a cause of action and determined that a single cause of action arose when the inhalation of asbestos fibers produced at least one physical effect, in this case asbestosis.⁵⁶

The inequity of this opinion is immediately apparent.⁵⁷ The

calculating the recovery, the jury took into account the chance that the plaintiff would not contract cancer.), *review denied*, 492 So. 2d 1331 (Fla. 1986).

50. 727 F.2d 506 (5th Cir.) (interpreting Mississippi law), *modified en banc*, 750 F.2d 1314 (5th Cir. 1984), *questions certified*, 757 F.2d 614 (5th Cir.), *cert. declined*, 469 So. 2d 99 (Miss. 1985), *aff'd en banc*, 781 F.2d 394 (5th Cir.), *cert. denied*, 478 U.S. 1022 (1986).

51. *Id.* at 509.

52. *Id.* at 510. The plaintiff also claimed damages for loss of energy and stamina, impaired working ability, mental frustration, medical monitoring costs, and reduced life expectancy. *Id.*

53. Wong, *Using Epidemiology to Determine Causation in Disease*, 2 NAT. RESOURCES J. 20, 20 (1984). Wong defines epidemiology as "the study of distribution and determinants of diseases. In other words, epidemiologists, based on properly designed studies, identify groups with high rates of a disease (distribution) and determine what factors cause the higher rates (determinants)." *Id.* The weight given to an epidemiological finding of a causal association between exposure to a toxic agent and certain effects in human beings depends on a number of factors: strength and significance of association, consistency of association, specificity, temporality, dose-response relationship, and biological plausibility and coherence with existing knowledge. *Id.* at 21-22, 49 (citing Hill, *The Environment and Disease: Association with Causation?* 58 PROC. ROYAL SOC'Y MED. 295 (1965)); see also Cornfeld & Minton, *How to Defend Against an Adverse Epidemiological Study*, 3 TOXICS L. REP. (BNA) 1092 (Feb. 8, 1989) (discussing ten principles for analyzing and interpreting epidemiological studies); Rodricks, *The Problem of Causation in Toxic Tort Litigation*, 1 TOXICS L. REP. (BNA) 923 (Jan. 28, 1987) (discussing the type of evidence used to prove causation in toxic tort litigation).

54. *Jackson*, 727 F.2d at 516.

55. *Jackson v. Johns-Manville Sales Corp.*, 781 F.2d 394, 411-12 (5th Cir. 1986) (en banc).

56. *Id.* at 412.

57. For a robust criticism of the result in *Jackson*, see Hagerty v. L & L Marine Servs., Inc., 788 F.2d 315, 320-21 (5th Cir.) (interpreting Louisiana law) (applying the rule against splitting a cause of action but at the same time subjecting it to trenchant criticism), *modified en banc*, 797 F.2d 256 (1986).

plaintiff was fully compensated for a future injury he may never suffer. In addition, all similarly situated shipyard workers with like exposure to that of the plaintiff will be able to rely upon the same epidemiological studies to establish a greater than fifty-percent likelihood of contracting an asbestos-related cancer, therefore establishing a right to full compensation for cancer. Looked at another way, if one assumes that the number of shipyard workers who fall into the risk group identified by the epidemiological studies is 100, and the risk of asbestos-related cancer can be quantified thereunder as fifty-one percent,⁵⁸ then all 100 shipyard workers will be entitled to recover full cancer damages, even though, if the statistics prove accurate, only fifty-one actually will contract cancer.⁵⁹ The result is a glaring example of overdeterrence,⁶⁰ resulting in unwarranted interference with the

58. Scientific studies of asbestos have resulted in atypically good estimates of the health risks posed by asbestos to humans. See Elliott, *The Future of Toxic Torts: Of Chemophobia, Risk as a Compensable Injury and Hybrid Compensation Systems*, 25 HOUS. L. REV. 781, 783-84 n.10 (1988) [hereinafter Elliott]. Yet epidemiological studies of asbestos industry workers rarely produce findings of a greater than fifty-percent risk. See generally WORLD HEALTH ORGANIZATION, INT'L AGENCY FOR RESEARCH ON CANCER, OVERALL EVALUATIONS OF CARCINOGENICITY, IARC MONOGRAPHS ON THE EVALUATION OF CARCINOGENIC RISKS TO HUMANS 106-09 (Supp. 7 1987) (reviewing data on the carcinogenicity of asbestos to humans) [hereinafter EVALUATION OF CARCINOGENIC RISKS TO HUMANS].

A clear association has been found between Diethylstilbestrol (DES), a drug used extensively to prevent miscarriages in pregnant women, and adenocarcinoma, a rare disease with a minimal incidence in the general population. See B. SEAMAN, *WOMEN AND THE CRISIS IN SEX HORMONES* 29-30 (1977). Statistical estimates of the incidence of adenocarcinoma among the daughters of women who ingested DES while pregnant, however, range only from 1 in 1,000 to 4 in 1,000. *Id.* at 29. Even if a "DES daughter" overcomes the considerable barrier of demonstrating a present physical effect of DES-exposure, her claim will founder on the unyielding rock of proof of a greater than fifty-percent chance that the cancer will occur. See, e.g., *McAdams v. Eli Lilly & Co.*, 638 F. Supp. 1173 (N.D. Ill. 1986) (interpreting Illinois law).

59. See generally Jose, *Causation in Toxic Torts: Why Rulings in Many Cases are and Will be Unfair*, 1 *Toxics L. Rep.* (BNA) 92 (July 2, 1986) (discussing several alternative standards of proof and the unfairness that will always result when proof is based upon epidemiological studies).

60. In its "Spring 1988 Progress Report," *Compensation and Liability for Product and Process Injuries*, the Council to the Members of The American Law Institute identified three problems that undermine the effectiveness of the "second tier" of the tort system—that is, the new areas of tort litigation created by enterprise liability, medical malpractice, and environmental harms—in achieving the goals of compensation and appropriate deterrence. A.L.I., *Compensation and Liability for Product and Process Injuries: Spring 1988 Progress Report* 15-16 (April 15, 1988) (discussion draft) [hereinafter *Spring 1988 Progress Report*]. The three problems are high administrative costs, incentive malfunctions, and loss insurance malfunctions. *Id.* Overdeterrence constitutes the main incentive malfunction of the system, in that the imprecise tool of case-by-case litigation can result in overdeterrence of socially productive activity, namely, the potential wrongdoer choosing not to invest in a particular product or process because of the danger of vast liability against which it can take no prophylactic measures. *Id.* at 4, 16. High administrative costs refer to the high cost of the tort system—largely lawyers' fees—compared with other remedial mechanisms. *Id.* at 15. The

economic health of businesses that generate income and jobs.

Yet another, more serious inequity arises out of the strict application of the single cause of action rule in *Jackson*. The opinion takes no account of the victim's ability to prove the probable⁶¹ future consequences of exposure to a toxic agent. Although on the facts there was sufficient evidence in the record to support the jury's finding that Jackson would contract an asbestos-related cancer in the future,⁶² in the context of most other toxic exposures, the probability standard establishes an insuperable barrier to recovery for future diseases.⁶³ Consequently, strict application of the single cause of action rule encourages plaintiffs' attorneys to retain experts who are willing to present an extreme interpretation of available scientific evidence in order to ensure that a claim will reach the jury.⁶⁴ Another potential consequence is that juries will not comply with the harsh standard of proof and therefore will render a verdict for the victim based on their own sense of justice.⁶⁵

An additional flaw in the *Jackson* opinion⁶⁶ is that the jury has minimal information upon which to make an assessment of the full

problem of loss-insurance malfunctions embraces the system's poor performance in adequately compensating victims. *Id.* at 15-16.

61. For a discussion of the meaning of the standard of probability to which future consequences must be proved, see *supra* notes 83-157.

62. *Jackson v. Johns-Manville Sales Corp.*, 781 F.2d 394, 411-13 (5th Cir.), *cert. denied*, 478 U.S. 1022 (1986).

63. Of reported cases involving a claim for increased risk of future disease stemming from exposure to a toxic agent, only two, both involving occupational exposure to asbestos, had appellate courts determine that the evidence presented satisfied the standard of proof for future consequences. *Jackson v. Johns-Manville Sales Corp.*, 727 F.2d 506 (5th Cir.) (interpreting Mississippi law), *modified en banc*, 750 F.2d 1314 (1984), *questions certified*, 757 F.2d 614 (5th Cir.), *cert. declined*, 469 So. 2d 99 (Miss. 1985), *aff'd en banc*, 781 F.2d 394, 411-13 (5th Cir.) (A shipyard worker with asbestosis recovered damages for his increased risk of an asbestos-related cancer when, based on epidemiological studies and his medical records, three expert witnesses were able to testify that he had a greater than fifty-percent chance of acquiring such a cancer in the future.), *cert. denied*, 478 U.S. 1022 (1986); *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1136-37 (5th Cir. 1985) (interpreting Texas law) (expert testimony that, in reasonable medical probability, plaintiff had a greater than fifty-percent risk of dying of an asbestos-related cancer was held sufficient to support the jury verdict).

64. See Elliott, *supra* note 58, at 786-87.

65. *Id.* at 787. Professor Elliott argues that the traditional rule holding that it is unfair to require a defendant to compensate a plaintiff for the plaintiff's losses unless the plaintiff proves that the defendant more likely than not caused those losses, "no longer captures our society's prevailing sense of justice in cases where innocent people have been involuntarily exposed to substances that are potentially dangerous to their health." *Id.*

66. 727 F.2d 506 (5th Cir.) (interpreting Mississippi law), *modified en banc*, 750 F.2d 1314 (5th Cir. 1984), *questions certified*, 757 F.2d 614 (5th Cir.), *cert. declined*, 469 So. 2d 99 (Miss. 1985), *aff'd en banc*, 781 F.2d 394 (5th Cir.), *cert. denied*, 478 U.S. 1022 (1986).

value of the victim's future cancer.⁶⁷ A greater than fifty-percent chance of an asbestos-related cancer occurring provides no information about the particular cancer that is likely to develop.⁶⁸ Nor is there any information as to when the disease will strike, what course it will take, what future treatment may be available, and how much it will cost. Yet such information is essential for a proper assessment of compensatory damages for such losses as medical treatment costs, pain and suffering, and diminished earning capacity.⁶⁹ Allowing the jury to evaluate such highly speculative matters undermines the tort goal of making the victim whole⁷⁰ and further destroys public confidence in the ability of the legal system to ensure justice.

By far the most serious consequence of the single cause of action rule, as applied in *Jackson*, is that victims of toxic exposure will never receive compensation for, and wrongdoers will never be deterred from exposing people to, the long-term effects of toxic agents. This result may be illustrated by the recent case of *Sterling v. Velsicol Chemical Corp.*,⁷¹ in which residents living in the vicinity of a landfill brought a class action suit to recover for personal injuries and property damage arising out of the migration of chlorinated hydrocarbons from the landfill owned by Velsicol.⁷² The five representative plaintiffs alleged presently ascertainable injuries such as liver and kidney damage, eye injuries, and numerous central nervous system injuries.⁷³ In addition, they brought claims demanding compensation for their fear and increased risk of contracting cancer and other diseases in the future.⁷⁴ The United States Court of Appeals for the Sixth Circuit, applying Tennessee law, reversed the trial court's award of damages for an

67. See *supra* note 49 (cases emphasizing the conjectural nature of the evidence in increased risk claims).

68. Asbestos exposure has been associated with bronchial carcinoma, pleural and peritoneal malignant mesotheliomas, and cancers of the larynx and gastrointestinal system (esophagus, stomach, colon, and rectum). G. PETERS & B. PETERS, SOURCEBOOK ON ASBESTOS DISEASES: MEDICAL, LEGAL, AND ENGINEERING ASPECTS B6-B9 (1980).

69. The speculative nature of the inquiry into the valuation of an increased risk claim must be distinguished from the ever-present problem in personal injury actions of monetarizing the victim's loss. All damage assessments in personal injury actions involve a component for what will probably happen in the future. See D. DOBBS, HANDBOOK ON THE LAW OF REMEDIES 286 (1973). The difference between the common or garden-variety personal injury case and the claim for increased risk is that, in the former case, damages are awarded on the basis of events that have occurred and from which experts can extrapolate future consequences. In contrast, the injury evaluated in the latter case has not occurred and may never occur.

70. For a list of the primary goals of modern tort law, see *supra* note 35.

71. 855 F.2d 1188 (6th Cir. 1988).

72. *Id.* at 1192-94.

73. *Id.* at 1201-03.

74. *Id.* at 1204-05.

increased susceptibility to cancer and other diseases ranging from twenty-five to thirty percent.⁷⁵ The Sixth Circuit held that the available evidence of future injury fell short of the greater-than-fifty-percent-chance standard established in *Jackson* and thus was uncompensable.⁷⁶

The significance of *Sterling* is that the proportion of local residents who subsequently succumb to cancer resulting from their involuntary exposure to Velsicol's chemicals will never be compensated. Like Mississippi law, interpreted in *Jackson*,⁷⁷ Tennessee law generally applies the single cause of action rule strictly.⁷⁸ The victim recovers no compensation for those elements of future loss that he cannot demonstrate to the appropriate standard of proof at the time the statute of limitation requires him to seek relief for presently ascertainable injuries.⁷⁹

Applying this rule to the facts of *Sterling* results in no specific compensation for any resident who later succumbs to a chlorinated hydrocarbon-related cancer. At the time the resident recovers damages for present injuries such as liver and kidney disease, he is unable to prove the future toxin-induced cancer has a greater than fifty-percent chance of occurring. Defenses of statute of limitation and *res judicata* would frustrate any attempt to pursue a second action for this later manifested injury. Thus, in the context of toxic exposure

75. *Id.* at 1205.

76. *Id.*

77. 727 F.2d 506 (5th Cir.) (interpreting Mississippi law), *modified en banc*, 750 F.2d 1314 (5th Cir. 1984), *questions certified*, 757 F.2d 614 (5th Cir.), *cert. declined*, 469 So. 2d 99 (Miss. 1985), *aff'd en banc*, 781 F.2d 394 (5th Cir.), *cert. denied*, 478 U.S. 1022 (1986).

78. *See, e.g.*, *National Cordova Corp. v. Memphis*, 214 Tenn. 371, 380, 380 S.W.2d 793, 797 (1964) ("A single tort can be the foundation for but one claim for damages. . . . All damages which can by any possibility result from a single tort form an indivisible cause of action.") (quoting *Johnston v. Southern Ry. Co.*, 155 Tenn. 639, 643, 299 S.W. 785, 786 (1927)).

79. *Potts v. Celotex Corp.*, 703 F. Supp. 672, 675-76 (E.D. Tenn. 1988). In *Potts*, a personal injury action was filed on behalf of an asbestos worker who had died of mesothelioma within one year of the mesothelioma diagnosis. *Id.* at 672-74. The worker had been advised that he had asbestosis thirteen years earlier. *Id.* at 672. The worker, however, chose not to sue for his asbestosis at that time. *Id.* The defendant asbestos companies obtained summary judgment based on a strict application of the single cause of action rule. *Id.* at 675-76. In granting the defendants' motion for summary judgment, the district court held that Tennessee law did not permit the one-year statute of limitation "to begin to run anew for each successive injury caused by the same wrongful act." *Id.* at 674.

The effect of this opinion is to require victims to file an action for future consequences at the time of their first exposure-related injury and to try to find a physician who will testify that, to a reasonable degree of medical probability, the victim will suffer the future consequences. Stated in the words of the court, "this 'single injury' rule may effectively preclude recovery for serious asbestos-related injuries that develop many years after an initial hurt . . ." *Id.* at 675-76.

cases, strict application of the single cause of action rule results in intolerable noncompensation of victims and consequent underdeterrence of wrongdoers.

Faced with the inherently speculative and conjectural nature of valuing risks in the context of the traditional all-or-nothing approach to damages, courts have attempted to minimize speculation by tinkering with the standard of proof,⁸⁰ the requirement of present injury,⁸¹ and the rule against splitting a cause of action.⁸² Such tinkering has

80. See *Rabb v. Orkin Exterminating Co.*, 677 F. Supp. 424, 426-27 (D.S.C. 1987) (interpreting South Carolina law) (United States district court denied motion for a new trial by homeowners exposed to termiticide because the homeowners failed to establish that they most probably would contract any disease related to Chlordane or Heptachlor.); *Stites v. Sundstrand Heat Transfer, Inc.*, 660 F. Supp. 1516, 1523-26 (W.D. Mich. 1987) (interpreting Michigan law) (District court granted manufacturing plant owner's summary judgment motion because the local residents who were exposed to trichloroethylene ("TCE") were unable to demonstrate the existence of facts supporting the reasonable certainty of the eventual occurrence of the future cancer.); *Larson v. Johns-Manville Corp.*, 427 Mich. 301, 317, 399 N.W.2d 1, 8 (1986) (Wrongful death actions to recover damages for asbestos-related cancers brought by the personal representatives of the estates of insulation workers were permissible when filed within three years of the date the workers discovered they had cancer, because at the time the workers first developed asbestosis, they could not have shown a reasonably certain future occurrence of asbestos-related cancers.); *Lavelle v. Owens-Corning Fiberglas Corp.*, 30 Ohio Misc. 2d 11, 13-14, 507 N.E.2d 476, 478-80 (C.P. Cayahoga County 1987) (granting asbestos manufacturer's motion *in limine* prohibiting an asbestosis-afflicted plaintiff from introducing at trial any evidence of his increased risk of cancer because evidence of the possibility that asbestosis might develop into cancer did not rise to the standard of reasonable certainty). *But see Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188, 1201 (6th Cir. 1988). In *Sterling*, the court stated:

Whereas numerous jurisdictions have rejected medical experts' conclusions based upon a 'probability,' a 'likelihood,' and an opinion that something is 'more likely than not' as insufficient medical proof, the Tennessee courts have adopted a far less stringent standard of proof and have required only that the plaintiffs prove a causal connection between their injuries and the defendant's tortious conduct by a preponderance of the evidence.

Id.

81. See, e.g., *Laswell v. Brown*, 683 F.2d 261, 269 (8th Cir. 1982) (Children of a serviceman, who had been exposed to low-level ionizing radiation during nuclear weapons testing, failed to state a claim on which relief could be granted when they merely alleged that they had been exposed to an "unusually high risk of disease in genetically passed cellular damage."); *cert. denied sub nom. Laswell v. Weinberger*, 459 U.S. 1210 (1983); *Burns v. Jaquays Mining Corp.*, 156 Ariz. 375, 376-78, 752 P.2d 28, 29-31 (Ct. App. 1988) (Court granted owner of an asbestos-producing mill summary judgment on a claim by local residents for increased risk of cancer and other diseases because the only "injury" alleged to have been suffered by the residents was exposure to asbestos fibers.); *Morrissy v. Eli Lilly & Co.*, 76 Ill. App. 3d 753, 756, 759-61, 394 N.E.2d 1369, 1372, 1374-76 (App. Ct. 1979) (Daughters of women who had ingested DES failed to state a claim on which relief could be granted for increased risk of suffering future diseases because the possibility of developing cancer or other injurious conditions as a consequence of exposure to DES *in utero* does not constitute a present injury.)

82. See, e.g., *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 120-21 (D.C. Cir. 1982) (interpreting District of Columbia law); *Eagle-Picher Indus., Inc. v. Cox*, 481 So. 2d 517, 521-

resulted in considerable confusion and a morass of conflict between different jurisdictions.

B. *Attempts to Minimize the Conjectural Nature of All-or-Nothing Damages*

1. STANDARD OF PROOF

The imposition of a higher standard of proof upon the victim is one apparent attempt to curb the speculation involved in increased risk of future disease claims.⁸³ The standard of proof is the degree of belief concerning a fact that the party with the burden of proof must establish in the mind of the factfinder or the court.⁸⁴ The standard of proof is relevant both to the issue of whether a party has satisfied the burden of production⁸⁵ and the issue of whether a party has satisfied the burden of persuasion.⁸⁶ In the usual situation in which the party carries both the burden of production and persuasion, the production burden is met by "the introduction of evidence which, viewed in the aspect most favorable to the burdened party, is sufficient to enable the trier of fact reasonably to find the existence of the particular element of the claim for relief to be more probably true than not true."⁸⁷ In the usual civil case, the persuasion burden is satisfied if the factfinder believes that the existence of the disputed fact is more probably true

26 (Fla. 3d DCA 1985), *review denied*, 492 So. 2d 1331 (Fla. 1986); *Ayers v. Township of Jackson*, 106 N.J. 557, 583-84, 525 A.2d 287, 300 (1987).

83. *See, e.g., Rabb*, 677 F. Supp. at 426 ("[I]n South Carolina [a recovery for prospective consequences] may include only such future damages as 'reasonably certain will of necessity' result in the future from the injury. . . . The 'reasonably certain' rule has been described as one 'which manifestly and logically will reasonably come to pass, and not a mere possibility or probability.'"); *Stites*, 660 F. Supp. at 1523-24 ("[A] reasonable certainty is more than a reasonable probability, 'describes the highest degree of probability,' and 'has practically the same meaning as 'in all likelihood.'"); *Lavelle*, 30 Ohio Misc. 2d at 14, 507 N.E.2d at 479 ("[T]he injury complained of, and for which damages are sought . . . must be shown with certainty, and not left to speculation or conjecture. . . . A plaintiff can never prove causation of a disease which [has] not yet manifested itself.").

84. *See* BLACK'S LAW DICTIONARY 1260, 178 (5th ed. 1979).

85. *See, e.g., Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1158, 1160 (4th Cir. 1986) (interpreting Maryland law) (The district court properly excluded any evidence of the pipefitter's risk of asbestos-related cancer because the proffered testimony failed to establish that the future cancer was reasonably probable or reasonably certain.).

86. *See, e.g., Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1137-38 (5th Cir. 1985) (interpreting Texas law) (Expert testimony that, in reasonable medical probability, an insulation warehouseman had a greater than fifty-percent chance of contracting and dying from an asbestos-related cancer was held sufficient to support the jury's award of damages in an increased risk claim.).

87. M. GRAHAM, EVIDENCE: TEXT, RULES, ILLUSTRATIONS & PROBLEMS 622-23 (1988).

than not true.⁸⁸ In the context of increased risk of future disease claims, however, a number of courts seem to impose a hybrid standard of proof upon specific elements of the action.⁸⁹

Presently, most courts describe the appropriate standard of proof for increased risk of future disease claims in terms of "reasonable certainty" or "reasonable probability": damages may be recovered for future consequences only if those consequences are "reasonably certain" or "reasonably probable."⁹⁰ This standard is best understood as requiring the victim to introduce evidence to demonstrate that the future event will more likely than not occur—that is, there is a greater than fifty percent chance of occurrence.⁹¹

The clarity of the reasonable certainty standard, however, has been confounded by a confusing clutter of labels, such as "in all likeli-

88. *Id.* at 623.

89. *See supra* note 82.

90. *See, e.g.*, *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1158, 1160 (4th Cir. 1986) (interpreting Maryland law) (reasonable probability); *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 119 (D.C. Cir. 1982) (interpreting District of Columbia law) (reasonably certain); *Larson v. Johns-Manville Sales Corp.*, 427 Mich. 301, 317, 399 N.W.2d 1, 8 (1986) (reasonable certainty); *Mauro v. Owens-Corning Fiberglas Corp.*, 225 N.J. Super. 196, 204, 542 A.2d 16, 20 (App. Div.) (reasonably probable), *cert. granted*, 113 N.J. 341, 550 A.2d 455 (1988); *Askey v. Occidental Chem. Corp.*, 102 A.D.2d 130, 136, 477 N.Y.S.2d 242, 247 (App. Div. 1984) (reasonable certainty and reasonable probability).

91. Perhaps the clearest statement of the standard of proof required in an increased risk claim was given in *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111 (D.C. Cir. 1982). In *Wilson*, the United States Court of Appeals for the District of Columbia stated:

The traditional American rule . . . is that recovery of damages based on future consequences may be had only if such consequences are 'reasonably certain.' . . . To meet the 'reasonably certain' standard, courts have generally required plaintiffs to prove that it is more likely than not (a greater than 50% chance) that the projected consequence will occur. If such proof is made, the alleged future effect may be treated as certain to happen and the injured party may be awarded full compensation for it; if the proof does not establish a greater than 50% chance, the injured party's award must be limited to damages for harm already manifest.

Id. at 119 (footnotes omitted).

Wilson, however, is a case in which the court refused to apply the rule against splitting a cause of action. *Id.* at 112. Six years before the suit was filed, doctors diagnosed the plaintiff as having asbestosis resulting from his exposure to asbestos at work. *Id.* at 113. *Wilson's* widow filed suit only when her husband died from malignant mesothelioma five years later. *Id.* at 112-13. The court reversed summary judgment for the defendant asbestos manufacturers, holding that the plaintiff's earlier asbestosis did not bar his widow from splitting the cause of action and simply seeking damages for the later cancer. *Id.* at 120-21.

hood,"⁹² "reasonably probable,"⁹³ "medically probable,"⁹⁴ "probable,"⁹⁵ "more probable than not,"⁹⁶ "a probability,"⁹⁷ "more likely than not,"⁹⁸ "greater than fifty percent,"⁹⁹ "reasonable medical cer-

92. See, e.g., *Stites v. Sundstrand Heat Transfer, Inc.*, 660 F. Supp. 1516, 1524 (W.D. Mich. 1987) (interpreting Michigan law) (Defendant manufacturer obtained summary judgment when landowners exposed to TCE failed to introduce any evidence upon which a reasonable jury could find that they would in all likelihood contract TCE-related cancer in the future.).

93. See, e.g., *Valori v. Johns-Manville Sales Corp.*, No. 82-2686, slip op. at 6-7 (D.N.J. Dec. 11, 1985) (district court denied asbestos product manufacturer's motion to exclude from trial any evidence of asbestos worker's increased risk of contracting cancer because proof that the worker was a member of a class of workers, forty-three percent of whom would contract cancer, satisfied the reasonable probability standard); *Mauro v. Owens-Corning Fiberglas Corp.*, 225 N.J. Super. 196, 199-205, 542 A.2d 16, 17-20 (App. Div.) (Asbestos worker's claim for enhanced risk of cancer was correctly dismissed on the basis that the testimony of the plaintiff's expert that there existed a high probability of increased risk and an unquantifiable increased risk failed to demonstrate that the cancer was a reasonably probable prospective consequence.), *cert. granted*, 113 N.J. 341, 550 A.2d 455 (1988).

94. See, e.g., *Adams v. Johns-Manville Sales Corp.*, 783 F.2d 589, 592 (5th Cir. 1986) (interpreting Louisiana law) (testimony of increased risk of asbestos-associated cancer held properly excluded, absent proof of a medical probability that plaintiff would develop cancer); *Pollock v. Johns-Manville Sales Corp.*, 686 F. Supp. 489, 489-92 (D.N.J. 1988) (interpreting New Jersey law) (defendant manufacturer's motion to exclude the issue of increased risk of cancer from trial granted on the ground that an asbestos worker's forty-three percent statistical probability of contracting cancer in the future did not amount to proof of a medical probability of occurrence).

95. See, e.g., *Lorenc v. Chemirad Corp.*, 37 N.J. 56, 73-77, 179 A.2d 401, 410-11 (1962) (doctor's award of damages for the risk of malignancy arising out of chemical burns upheld because medical testimony of probable malignancy provided reasonable support for the jury's verdict).

96. See, e.g., *Adams v. Johns-Manville Sales Corp.*, 727 F.2d 533, 538-39 (5th Cir. 1984) (interpreting Louisiana law) (Trial court did not commit error when it excluded evidence of an insulation worker's increased risk of cancer resulting from asbestos exposure because the insulation worker failed to introduce any evidence that his future medical expenses and future loss of earning capacity would be more probable than not.), *reh'g denied*, 783 F.2d 589 (5th Cir. 1986).

97. See, e.g., *McAdams v. Eli Lilly & Co.*, 638 F. Supp. 1173, 1174, 1174 n.78 (N.D. Ill. 1986) (interpreting Illinois law) (daughter of a widow who ingested DES was not permitted to present evidence at trial that women exposed to DES *in utero* are more likely to develop cancer because the evidence did not establish a probability that she would contract cancer; however, such evidence was admissible for the limited purpose of establishing a reasonable *fear* of cancer accompanying her present physical injury).

98. See, e.g., *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 119-20 (D.C. Cir. 1982) (interpreting District of Columbia law). In *Wilson*, the court permitted an asbestos worker to split his cause of action, enabling him to sue asbestos manufacturers for losses arising out of an asbestos-related cancer, despite the fact that he had earlier contracted asbestosis. *Id.* The court reasoned that it would have been unfair to have required the insulation worker to have sued for an increased risk of cancer at the time asbestosis manifested itself because he would not have been able to produce sufficient evidence to satisfy the more likely than not requirement under the "reasonably certain" standard. *Id.*

99. See, e.g., *Jackson v. Johns-Manville Sales Corp.*, 727 F.2d 506, 516 (5th Cir.) (interpreting Mississippi law) (in a claim by a shipyard worker for damages for an increased risk of asbestos-related cancer, the Fifth Circuit held that the occurrence of the future cancer

tainty,"¹⁰⁰ or any combination of the above.¹⁰¹ These labels are used in an apparent attempt to shed light upon the degree of proof required of the burdened party. The net effect of this profusion of language is to leave one wondering whether the courts are discussing the same standard or standards of subtly different degrees.

Compounding the uncertainty surrounding the meaning of the reasonably certain or reasonably probable standard, a number of courts seem to have created an equally uncertain heightened standard of proof for the recovery of prospective losses.¹⁰² These courts interpret reasonable certainty of future disease to mean that the victim must produce evidence that the disease will occur "in all likelihood" or with "the highest degree of probability."¹⁰³ Just what this means, in evidentiary terms, is anybody's guess.

The problematic nature of this heightened standard of proof is illustrated in *Stites v. Sundstrand Heat Transfer, Inc.*¹⁰⁴ In *Stites*, landowners ingested trichlorethylene (TCE) when the chemical migrated into their drinking water from the site of a manufacturing

had to be shown to be " 'probable' (a greater than 50 percent chance)", *modified en banc*, 750 F.2d 1314 (5th Cir. 1984), *questions certified*, 757 F.2d 614 (5th Cir.), *cert. declined*, 496 So. 2d 99 (Miss. 1985), *aff'd en banc*, 781 F.2d 394 (5th Cir.), *cert. denied*, 478 U.S. 1022 (1986).

100. *See, e.g.*, *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188, 1204-05 (6th Cir. 1988) (interpreting Tennessee law) (the district court erred in holding that expert testimony of an increased susceptibility to cancer and other diseases of 25-30% satisfied the reasonable medical certainty standard).

101. *See, e.g.*, *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1158, 1160 (4th Cir. 1986) (interpreting Maryland law). In *Lohrmann*, the United States Court of Appeals for the Fourth Circuit held that the district court properly excluded evidence of a risk of asbestos-related cancer on the issue of damages because the evidence did not indicate that the pipefitter's risk of cancer was "reasonably probable or reasonably certain." *Id.* at 1160. The Fourth Circuit further stated: " 'Probability exists when there is more evidence in favor of a proposition than against it (a greater than 50% chance that a future consequence will occur). Mere possibility exists when the evidence is anything less.' " *Id.* (quoting *Pierce v. Johns-Manville Sales Corp.*, 296 Md. 656, 666, 464 A.2d 1020, 1026 (1983)).

102. *See supra* note 80.

103. *See Stites v. Sundstrand Heat Transfer, Inc.*, 660 F. Supp. 1516, 1524 (W.D. Mich. 1987). For further discussion of this case, see *infra* notes 103-14 and accompanying text. *See also* *Larson v. Johns-Manville Corp.*, 427 Mich. 301, 317, 399 N.W.2d 1, 8 (1986) (Court allowed wrongful death actions although the victims had earlier discovered that they had asbestosis because had they tried to prove a cancer risk claim back when they discovered their asbestosis, they could not have met the standard that " 'only such future damages can be recovered as the evidence makes reasonably certain will necessarily result from the injury sustained' " (quoting *King v. Neller*, 228 Mich. 15, 22, 199 N.W. 674 (1924).); *Lavelle v. Owens-Corning Fiberglas Corp.*, 30 Ohio Misc. 2d 11, 13-14, 507 N.E.2d 476, 478-79 (C.P. Cayahoga County 1987) (evidence of asbestosis-afflicted worker's increased risk of contracting cancer held inadmissible because the injury and the damages resulting therefrom must be proved with certainty, and evidence that pain, suffering, or a condition *may* result from an existing injury is incompetent).

104. 660 F. Supp. 1516 (W.D. Mich. 1987).

plant.¹⁰⁵ The landowners brought an action for their increased risk of contracting cancer.¹⁰⁶ In response, the manufacturer moved for summary judgment and submitted detailed affidavits stating that TCE could not be categorized as a human carcinogen and, alternatively, that to a reasonable degree of medical certainty, the residents were exposed to an increased risk of only 0.186 percent.¹⁰⁷ In opposition, the landowners introduced expert affidavits stating that TCE had damaged the residents' immune systems and that, consequently, they had a "greatly increased susceptibility to a number of future illnesses, particularly cancer."¹⁰⁸ The United States District Court for the Western District of Michigan granted the manufacturer's motion for summary judgment, declaring: "in Michigan, in order to recover damages on the basis of future consequences, it is necessary for a plaintiff to demonstrate with 'reasonable certainty' that the future consequences will occur."¹⁰⁹ The court defined "reasonable certainty" as follows: "[A] reasonable certainty is more than a reasonable probability, 'describes the highest degree of probability,' and 'has practically the same meaning as 'in all likelihood.'"¹¹⁰

The *Stites* court's exposition of the standard of proof is distinctly unhelpful. What proof, above a reasonable probability but below a certainty, will satisfy this hybrid standard? The phrase "in all likelihood" seems to suggest a higher standard than "more likely than not."¹¹¹ Given that very few increased risk claimants have been able

105. *Id.* at 1517.

106. *Id.*

107. *Id.* at 1519-20. The defendant had scientific experts submit detailed affidavits. *Id.* The affidavits explained how "one [could not] conclude to a reasonable degree of medical and scientific certainty that TCE is a human carcinogen." *Id.* at 1519. They calculated that, even assuming that TCE is a human carcinogen, one could not conclude, to a reasonable degree of medical and scientific certainty, that TCE, at the maximum estimated exposure level of twelve parts per million, presents a risk of cancer that could be classified as anything other than extremely speculative and insignificant. *Id.* at 1519-20. Envisioning a worst-case scenario, defense experts calculated that it was highly unlikely that any of the plaintiffs would get cancer as a result of exposure to TCE—the maximum risk was 186 per 100,000 (0.186%). *Id.* at 1519. In addition, the affidavits detailed how one could not conclude, to a reasonable degree of medical and scientific certainty, that TCE causes immune system injury. *Id.* at 1520. For the meaning of "to a reasonable degree of medical certainty," see *infra* notes 124-25 and accompanying text.

108. *Stites*, 660 F. Supp. at 1521. The landowners' affidavits contained epidemiological data supporting the proposition that TCE is a weak carcinogen, the Environmental Protection Agency finding that TCE is a probable human carcinogen, and evidence that the amount of TCE in the water supply exceeded regulatory standards. *Id.*

109. *Id.* at 1523.

110. *Id.* at 1524 (quoting *King v. Neller*, 228 Mich. 15, 22, 199 N.W. 674, 676 (1924)).

111. If a case similar to *Stites* were to go to trial and survive a motion for a directed verdict, the judge probably would have to instruct the jury that, to find in the victim's favor, they must find more probably true than not true the existence of elements such as breach of a legal

to surmount the "more likely than not" hurdle,¹¹² the heightened standard acts as a de facto guarantee that, in the context of present scientific knowledge, no increased risk of disease claim will succeed. Additionally, this heightened standard does not control speculation, or from the wrongdoer's perspective, overdeterrence and overcompensation.¹¹³ Assuming that the "in all likelihood" standard can be interpreted as requiring a greater than seventy-five percent probability, and assuming that any victim will assert his claim on the basis of epidemiological studies,¹¹⁴ then, in theory, twenty-five percent of all those victims who meet the seventy-five percent standard will receive a windfall because they will not contract the disease. The impact of this windfall is to overdeter the wrongdoer.¹¹⁵

In another apparent attempt to grapple with the speculative nature of increased risk claims, some courts have expressed the standard of proof in terms of reasonable medical certainty¹¹⁶ or reasonable medical probability.¹¹⁷ In *Mauro v. Owens-Corning Fiberglas*

obligation, toxic exposure, and present physical injury. The judge, however, probably would instruct the jury that, to find for the victim on the element of future cancer, they must find its existence true in all likelihood. Thus it would seem that the court has imposed a "clear and convincing" standard of proof for one element of damages in the increased risk claim. See E. CLEARY, *MCCORMICK ON EVIDENCE* 959-60 (3d ed. 1984) (suggesting that the "clear and convincing" standard of proof utilized in a limited number of civil cases means the jury must be persuaded that the existence of the disputed fact is highly probable).

112. See *supra* note 63.

113. As to the damage caused to the tort system by overdeterrence and overcompensation, see *supra* note 60.

114. The assumption that an increased risk of future disease claimant will rely on epidemiological evidence reflects, in large part, what happens in reality due to our inchoate understanding of the etiology of cancer. See McElveen, *supra* note 7, at 217-38 (discussing judicial attitudes about the use of epidemiology to establish causation and the inherent limitation of epidemiology, in that it cannot isolate the specific cause of a single individual's injury); Rodricks, *supra* note 53 (discussing the type of evidence necessary to prove that exposure to a toxic agent caused the victim's injury).

115. See Jose, *supra* note 59, at 92-93.

116. See, e.g., *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188, 1204 (6th Cir. 1988) (interpreting Tennessee law) (In an increased risk of disease claim, "the predicted future disease must be medically reasonably certain to follow from the existing present injury.").

117. See, e.g., *Pollock v. Johns-Manville Sales Corp.*, 686 F. Supp. 489, 490 (D.N.J. 1988) (interpreting New Jersey law) ("in order to recover damages for a prospective injury such as the increased risk of developing cancer, plaintiff must establish proof of 'reasonable medical probability'"); *Mauro v. Owens-Corning Fiberglas Corp.*, 225 N.J. Super. 196, 201, 205, 542 A.2d 16, 18, 20-21 (App. Div.) (A court may appropriately grant a defense motion for a directed verdict on an increased risk claim if plaintiff's experts are "unable to quantify plaintiff's enhanced risk of cancer and to predict, within a degree of reasonable probability, that plaintiff will develop cancer."), *cert. granted*, 113 N.J. 341, 550 A.2d 455 (1988); *Devlin v. Johns-Manville Corp.*, 202 N.J. Super. 556, 559-60, 495 A.2d 495, 497 (Law Div. 1985) (The standard of proof required to recover for prospective asbestos-related injury is proof to a reasonable medical probability.).

Corp.,¹¹⁸ the plaintiff, a plumber and steam fitter who had performed various jobs involving the asbestos-containing products manufactured by the defendants, brought an action to recover damages for his present medical condition, his emotional distress, his enhanced risk of cancer and his expenses in having to undergo future medical surveillance.¹¹⁹ At the close of plaintiff's case, the trial court directed a verdict in the defendants' favor on the plaintiff's enhanced risk claim.¹²⁰ On appeal, the Appellate Division of the Superior Court of New Jersey upheld the directed verdict, declaring that the standard of proof required to recover for prospective injury is proof to a reasonable medical probability.¹²¹ The court determined that the plaintiff's medical experts' inability to quantify the enhanced risk of cancer or to give an opinion that, to a reasonable degree of medical probability, the plaintiff would develop cancer, was fatal to his enhanced risk claim.¹²²

The *Mauro* approach, however, has the potential for causing confusion since the standard of expert testimony "within a degree of reasonable probability"¹²³ has a function separate from that of the standard of proof. Properly understood, when expert testimony is given to a "reasonable degree of medical or scientific certainty" or to a "reasonable degree of medical or scientific probability," what is meant is that the opinion is in conformity with a substantially accepted explanatory theory.¹²⁴ The "certainty" referred to is not certainty that a future condition will or will not exist.¹²⁵ On the other hand, the standard of proof refers to the degree of certainty to which evidence of a disputed fact must rise in order for the court or

118. 225 N.J. Super. 196, 542 A.2d 16 (App. Div.), *cert. granted*, 113 N.J. 341, 550 A.2d 455 (1988).

119. *Id.* at 199-201, 542 A.2d at 17-18.

120. *Id.* at 201, 542 A.2d at 18.

121. *Id.* at 204-05, 542 A.2d at 20.

122. *Id.* at 200-05, 542 A.2d at 18-21.

123. *Id.*

124. M. GRAHAM, *supra* note 86, at 261-62. The expert's opinion does not have to conform to the only accepted explanatory theory; the probabilities expressed by the expert as his opinion must simply be derived from a substantially accepted explanatory theory. *Id.* This "standard of conformity" is most frequently analyzed within the framework of the rule of evidence permitting expert testimony on matters of scientific, technical, or other specialized knowledge. See, e.g., FED. R. EVID. 702; see also Firestone, *With Reasonable Medical Certainty (Probability)*, 12 LEGAL ASPECTS MED. PRAC. 1, 1-4 (1984) (discussing how "reasonable medical certainty" is a threshold for admissibility, distinguishing speculation from competent opinion evidence, and suggesting physicians need to be informed that, if they cannot form an opinion with sufficient certainty so as to make a medical judgment—as they do in their everyday professional life—then they can provide nothing upon which a factfinder can make a legal judgment).

125. Howard, *Future Consequences of Injury: Satisfying the Rule Against Conjecture*, 76 ILL. B.J. 666, 667 (1988).

factfinder to treat it as true.¹²⁶ Despite the confusing use of similar terminology for each standard, "reasonable medical certainty" as an evidentiary threshold for expert opinion is quite distinct from "reasonable certainty" as a standard for proving the existence of a fact.¹²⁷ Some courts' habit of collapsing the two standards into one¹²⁸ only serves to undermine the important function played by each.

Such conceptual confusion bedeviled the opinion of the United States Court of Appeals for the Sixth Circuit in *Sterling v. Velsicol Chemical Corp.*¹²⁹ In a bench trial, the United States District Court for the Western District of Tennessee found Velsicol liable for personal injuries arising after toxic agents, contained in the waste products of the production of chlorinated hydrocarbon pesticides dumped at a landfill, contaminated local well water.¹³⁰ The Sixth Circuit affirmed the district court's award of compensatory damages, except to the extent that the district court awarded damages for a twenty-five to thirty-percent increased susceptibility to cancer and other diseases,¹³¹ and for immune system impairment and learning disorders.¹³² On the issue of increased susceptibility to diseases, the Sixth Circuit reversed the damages award on the ground that the district court's factual finding of a twenty-five to thirty-percent risk, as a matter of law, could not satisfy the standard of proof that an anticipated harm be a "reasonable medical certainty."¹³³ Regarding the award for immune system impairment and learning disorders, the court reversed the district court's judgment for the area residents because their experts' testimony that the pesticide manufacturer's waste chemicals harmed the residents' immune systems and provoked a learning disorder in one individual failed to conform to a generally accepted explanatory scientific theory.¹³⁴

126. See text accompanying notes 84-88.

127. See generally Hullverson, Reasonable Degree of Medical Certainty: A Tort et a Travers, 31 ST. LOUIS U.L.J. 577 (1987) (discussing how "reasonable medical certainty" defies definition or analytical pigeon-holing and advocating a clean break with past semantical confusion).

128. See *supra* notes 116-17.

129. 855 F.2d 1188 (6th Cir. 1988).

130. *Id.* at 1192, 1194. The court also awarded property damages and punitive damages. *Id.* at 1194. Velsicol was held liable on theories of strict liability, common law negligence, trespass and nuisance. *Id.*

131. *Id.* at 1205.

132. *Id.* at 1207-09.

133. *Id.* at 1205. The Sixth Circuit implied that it would have upheld the decision below had the plaintiffs introduced expert testimony that the particular plaintiffs had a "probability—i.e., more than a fifty percent chance—of developing cancer and kidney or liver disease." *Id.*

134. *Id.* at 1209. The court explained that the theory of clinical ecology underpinning the

The Sixth Circuit's analysis of the claims for increased risk and immune system impairment illustrates the confusion engendered by the use of the "reasonable medical certainty" standard. Under the heading "proximate causation,"¹³⁵ the court set out the applicable rule of law in Tennessee: "To the extent that the plaintiffs seek damages for their bodily injuries, they must *prove* to a 'reasonable medical certainty,' though they need not use that specific terminology, that their ingestion of the contaminated water caused each of their particular injuries."¹³⁶ The court explained that the "reasonable medical certainty" standard embraces the witness' qualifications, the degree to which his theories are accepted in the scientific community, and the degree of certainty of his opinions.¹³⁷ Regarding the last factor, the court stated that Tennessee law requires a preponderance of the evidence standard of proof: "[P]roof by a reasonable medical certainty requires [the victim] only to establish that [his] particular injuries more likely than not were caused by ingesting the contaminated water" ¹³⁸ The Tennessee courts had addressed these rules on numerous occasions.¹³⁹

When the court applied the "reasonable medical certainty" standard to the increased risk claim, the reference to "certainty" in the standard's label forced the court to stress that the "certainty" standard does not require that the evidence "conclusively establish with absolute certainty that the future disease . . . will occur."¹⁴⁰ The court, however, could have avoided this muddle by resorting to plain language. Properly understood, when an expert expresses an opinion in terms of "reasonable medical certainty," he is simply asserting that the opinion conforms to a substantially accepted explanatory theory.¹⁴¹ When the court addressed the issue of whether a factual finding of a twenty-five to thirty percent increased risk of disease could

testimony of the victims' experts specifically had been rejected as unscientific by the American Academy of Allergy and Immunology and the California Medical Association. *Id.* at 1208. Moreover, the victims' experts could not identify any studies of the effect of carbon tetrachloride or chloroform on the immune system. *Id.* at 1208-09.

135. *Id.* at 1198.

136. *Id.* at 1200 (emphasis added) (citing *Thompson v. Underwood*, 407 F.2d 994 (6th Cir. 1969); *Maryland Casualty Co. v. Young*, 211 Tenn. 1, 362 S.W.2d 241 (1962)).

137. 855 F.2d at 1200.

138. *Id.* at 1201. A medical expert's opinion of causality between toxic exposure and injury expressed as "a probability," "a likelihood," or "more likely than not" may satisfy the burdens of production and proof, whereas an opinion voiced as "possible," "may have," "might have," or "could have" would not. *Id.*

139. *Id.* at 1200.

140. *Id.* at 1204.

141. *See supra* notes 120-21 and accompanying text.

support an award of prospective damages, however, the court did not discuss the acceptance within the scientific community of the theory underpinning the expert testimony about disease risk.¹⁴² Instead, the court was concerned with the speculative nature of a disease with a twenty-five to thirty percent chance of occurrence.¹⁴³ The court could have disposed of the increased risk claim by simply holding that, viewing the increased risk evidence in the light most favorable to the plaintiffs, it was *not* sufficient to enable the factfinder reasonably to find more probably true than not true the existence of the future consequence.¹⁴⁴

When the court discussed the claim for immune system impairment, it made no mention of the "reasonable medical certainty" standard.¹⁴⁵ Yet the Sixth Circuit reversed the award for immune system impairment precisely because it was based on expert testimony that relied on a theory that has not become generally accepted within the scientific community.¹⁴⁶ The court applied a four-part test, under the authority of Federal Rule of Evidence 702,¹⁴⁷ to testimony by two clinical ecologists that the pesticide manufacturer's waste chemicals harmed the area residents' immune systems.¹⁴⁸ The third element of the test, namely that the testimony is in conformity with a generally accepted explanatory theory,¹⁴⁹ serves precisely the function of the "reasonable medical certainty" standard.¹⁵⁰ As the court's robust analysis of the testimony regarding immune system impairment indicates,¹⁵¹ there is absolutely no need to clutter the analysis with such

142. *Sterling*, 855 F.2d at 1204-05.

143. *Id.* at 1205.

144. *See supra* note 84 and accompanying text.

145. *Sterling*, 855 F.2d at 1207-09.

146. *Id.* at 1209. Earlier in the opinion, the court had specifically stated that the "reasonable medical certainty standard" . . . implicates . . . the acceptance in the scientific community of [the expert's] theories." *Id.* at 1200.

147. Federal Rule of Evidence 702 provides:

If scientific, technical or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

Expert testimony is admissible under Rule 702 if the party desiring to introduce the testimony proves that the expert is "(1) a qualified expert (2) testifying on a proper subject (3) which is in conformity to a generally accepted explanatory theory (4) the probative value of which outweighs its prejudicial effect." *Sterling*, 855 F.2d at 1208 (citing *United States v. Kozminski*, 821 F.2d 1186, 1194 (6th Cir.), *aff'd*, 108 S. Ct. 2751 (1988); *United States v. Brown*, 557 F.2d 541 (6th Cir. 1977); *United States v. Green*, 548 F.2d 1261 (6th Cir. 1977)).

148. *Sterling*, 855 F.2d at 1207-08.

149. *Id.*

150. *See supra* notes 124-25 and accompanying text.

151. *Sterling*, 855 F.2d at 1207-09.

misleading terms as "reasonable medical certainty."¹⁵²

As the law stands today, however, the standard of "reasonable medical certainty" as an evidentiary threshold for expert opinion, and "reasonable certainty" as a standard for proving the existence of a fact, are interrelated in the area of increased risk of future disease claims. This interrelationship was exemplified in *Gideon v. Johns-Manville Sales Corp.*¹⁵³ In *Gideon*, an asbestos insulation worker claimed damages for his enhanced risk of suffering cancer in the future.¹⁵⁴ The United States Court of Appeals for the Fifth Circuit ruled that the appropriate standard of proof for recovery for prospective damages is that the future event be more likely to occur than not.¹⁵⁵ The court also stated that since the future consequence in issue was a potential medical disease, the future could only be prophesied by "a qualified physician's opinion testimony based on reasonable medical probability."¹⁵⁶ The court then stated that testimony as to possibilities would not satisfy the standard of persuasion.¹⁵⁷ Consequently, if a victim pursues a claim for increased risk of disease, he will require expert medical testimony in his favor anchored upon the bedrock of reasonable medical probability.

In actions for increased risk of disease, courts have lacked consistency in their exposition of the standard of proof to which the future consequences of a present injury must be proved. This failure stems from the lack of careful analysis of the policy considerations underlying increased risk claims. The same flaw vitiates the courts' analysis of the present injury component of the cause of action for increased risk of disease.

2. THE PRESENT INJURY REQUIREMENT

As an alternative to imposing a heightened standard of proof, some courts attempt to control the conjectural nature of increased risk claims by requiring the victim to demonstrate a narrowly defined present injury.¹⁵⁸ In order to ensure that the victim's claim of future injury is not purely speculative, the victim must demonstrate the existence of a present injury¹⁵⁹ because the "threat of future harm, not

152. See generally Hullverson, *supra* note 127.

153. 761 F.2d 1129 (5th Cir. 1985) (interpreting Texas law). For further discussion of this case, see *supra* notes 34 & 47.

154. *Id.* at 1133.

155. *Id.* at 1137-38.

156. *Id.* at 1137.

157. *Id.*

158. See *supra* note 4.

159. See, e.g., *Brafford v. Susquehanna Corp.*, 586 F. Supp. 14, 17-18 (D. Colo. 1984)

yet realized, is not enough."¹⁶⁰ The present harm serves as an anchor for the future consequences.¹⁶¹ Thus a broken kneecap provides the necessary basis in fact to allow recovery for an increased risk of degenerative arthritis.¹⁶²

Traditionally, the present injury requirement has been satisfied by proof that the victim is suffering from a physical injury that is symptom-producing.¹⁶³ Toxic exposure victims subject to increased risk of insidious diseases have attempted to satisfy this requirement, and its underlying purpose, by characterizing their increased risk as a present, subclinical¹⁶⁴ injury, which over time may develop into the full-blown disease. Most courts, however, have chosen to ignore developments in modern science that enable the isolation of the indicia of insidious diseases.¹⁶⁵ These courts have rejected such a characterization of increased risk, insisting instead upon a symptomatic, physical injury.¹⁶⁶ Such a rigid definition of present injury avoids

(interpreting Colorado law) (Individuals who lived adjacent to a uranium milling facility were permitted to proceed with a claim for increased risk of cancer because allegations of subcellular chromosomal damage caused by radiation exposure, at the very least, raised a question of fact as to whether these individuals had sustained definite, present physical injury).

160. PROSSER & KEETON, *supra* note 27, at 165.

161. See Kanner, *Emerging Conceptions of Latent Personal Injuries in Toxic Tort Litigation*, 18 RUTGERS L.J. 343, 350-62 (1987) (arguing that the present injury requirement for increased risk claims should be interpreted broadly to be consistent with advances in science).

162. *Starlings v. Ski Roundtop Corp.*, 493 F. Supp. 507, 509-10 (M.D. Pa. 1980) (interpreting Pennsylvania law).

163. Kanner describes the basic paradigm of an injury, as conceived by the courts, as "an ordinary adverse impact that is either discrete and localized in a presently identifiable manner, or which is symptom producing." Kanner, *supra* note 161, at 353.

164. As used in this Comment, "subclinical" refers to laboratory findings of anatomical changes during the period in the evolution of a disease prior to the manifestation of symptoms and is to be distinguished from "clinical," which denotes the symptoms and course of a disease. STEDMAN'S, *supra* note 8, at 288, 1355.

165. Kanner states that "[m]odern medical science enables us to see 'risk' as present chromosomal damage or immunological damage." Kanner, *supra* note 161, at 350.

166. See, e.g., *Schweitzer v. Consolidated Rail Corp.*, 758 F.2d 936, 942 (3d Cir.) (subclinical injury resulting from exposure to asbestos is insufficient to constitute the identifiable, actual loss or damage to a victim's interests required to sustain a cause of action), *cert. denied*, 474 U.S. 864 (1985); *Laswell v. Brown*, 683 F.2d 261, 269 (8th Cir. 1982) (claim by children of an individual, who died of cancer after being exposed to low-level ionizing radiation, for genetically transmitted cellular damage and exposure to an unusually high risk of disease cannot support a lawsuit for present injuries), *cert. denied sub nom. Laswell v. Weinberger*, 459 U.S. 1210 (1983); *Burns v. Jaquays Mining Corp.*, 156 Ariz. 375, 377-78, 752 P.2d 28, 30-31 (Ct. App. 1988) (The mere presence of asbestos fibers in the lungs, causing changes in the lung tissue, is not sufficient to constitute the actual loss or damage required to support a claim, by residents living adjacent to an asbestos mill, for increased risk of asbestosis and cancer.); *Morrissy v. Eli Lilly & Co.*, 76 Ill. App. 3d 753, 761, 394 N.E.2d 1369, 1376 (App. Ct. 1979) (allegations of exposure to DES *in utero* and the existence of latent disease are an insufficient basis upon which to recognize a present injury). *But see, e.g., Barth v. Firestone Tire and Rubber Co.*, 673 F. Supp. 1466, 1467-70 (N.D. Cal. 1987) (interpreting California

speculation; however, it unfairly leaves many toxic exposure victims, who have in no way contributed to their exposure, completely without remedy.

3. SPLIT CAUSE OF ACTION

Allowing a victim to split his cause of action is presently touted by most courts as the best solution for the problems arising out of lawsuits based on toxic exposure resulting in an increased risk of insidious disease.¹⁶⁷ Whenever the court decides to split the cause of action, the victim is not permitted to pursue an increased risk claim if and when the toxic exposure results in any harm. Rather, the victim is forced to wait until an exposure-related insidious disease manifests itself. Only when the disease strikes is the victim allowed to sue.¹⁶⁸ Grounds often advanced for such an approach include avoidance of speculation, fairness to the parties, evidentiary considerations regarding causation, and judicial economy.¹⁶⁹ Careful consideration of

law) (allegations of immune system damage and the presence of latent diseases in a complaint seeking the creation of a medical monitoring fund to provide information, preventative medical advice, and prompt medical care to tire workers exposed to industrial toxins constituted a legally cognizable injury); *McAdams v. Eli Lilly & Co.*, 638 F. Supp. 1173, 1174-75 (N.D. Ill. 1986) (interpreting Illinois law) (implicit in the court's ruling on the increased risk and fear of cancer claims is the recognition that DES-induced abnormalities and deformities of the reproductive system characterized as premalignant disease constitute present injury); *Brafford v. Susquehanna Corp.*, 586 F. Supp. 14, 17-18 (D. Colo. 1984) (interpreting Colorado law) (allegations of subcellular chromosomal damage caused by radiation exposure, at the very least, raised a question of fact as to whether the requirement of definite, present physical injury was satisfied).

167. See, e.g., *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 120-21 (D.C. Cir. 1982) (interpreting District of Columbia law) (The District of Columbia Circuit held that it would be unfair to require the decedent to have brought an action for future cancer at the time he contracted asbestosis many years before he contracted cancer because of the substantial difficulties of proof.); *Eagle-Picher Indus., Inc. v. Cox*, 481 So. 2d 517, 519-26 (Fla. 3d DCA 1985) (The court held that an asbestos worker presently suffering from asbestosis could not recover damages for an enhanced risk of contracting cancer in the future, but allowed him to bring an action in the future should he actually contract an asbestos-related cancer.), *review denied*, 492 So. 2d 1331 (Fla. 1986); *Ayers v. Township of Jackson*, 106 N.J. 557, 584, 598-99, 525 A.2d 287, 300, 308 (1987) (The Supreme Court of New Jersey declined to recognize a cause of action for an unquantified enhanced risk of disease, preferring instead to recognize an action in the future once the disease manifests itself.).

168. See, e.g., *Anderson v. W.R. Grace & Co.*, 628 F. Supp. 1219, 1231-32 (D. Mass. 1986) (interpreting Massachusetts law) (Residents' action for their increased risk of cancer and leukemia resulting from consumption of contaminated groundwater would be delayed until the illnesses manifest themselves, if such injuries resulted from disease processes different from the diseases that the residents presently suffered.); *Eagle-Picher*, 481 So. 2d at 519-26 (an asbestos worker's claim for a greater than fifty-percent risk of suffering future cancer was dismissed subject to the right to relitigate should he actually contract the cancer later).

169. See, e.g., *Wilson*, 684 F.2d at 118-20 (discussing each of these grounds); *Anderson*, 628 F. Supp. at 1232 (discussing avoidance of speculation and fairness to the parties); *Eagle-Picher*, 481 So. 2d at 521-26 (discussing each of these grounds); *Mauro v. Owens-Corning Fiberglas*

these grounds, however, reveals that they are not so clearly favorable to claim-splitting.

*Ayers v. Township of Jackson*¹⁷⁰ contains the most open discussion of the policies favoring a split cause of action.¹⁷¹ In *Ayers*, toxic pollutants leached into the local aquifer from a city landfill and contaminated adjacent property owners' well water.¹⁷² The property owners brought a nuisance action and recovered damages for emotional distress, deterioration of their quality of life, and medical surveillance.¹⁷³ The property owners, however, appealed the trial court's dismissal of their claim for damages for their increased risk of disease.¹⁷⁴ The expert for the property owners testified that they had an increased risk of cancer due to exposure to toxic agents in their drinking water.¹⁷⁵ The expert could not quantify the extent of the enhanced risk of cancer due to the lack of scientific information concerning the effect of the interaction of the various chemicals to which the property owners were exposed.¹⁷⁶ The Appellate Division of the New Jersey Superior Court affirmed the trial court's dismissal of the increased risk claim¹⁷⁷ and the property owners petitioned the Supreme Court of New Jersey for certification to review this decision.¹⁷⁸

Having granted the petition for certification, the Supreme Court of New Jersey viewed its task as one of balancing the policy considerations of recognizing a cause of action for unquantified increased risk claims and recognizing a separate cause of action in the future, arising if and when the disease manifested itself.¹⁷⁹ The court felt that, if it recognized an action for an unquantified increased risk of disease, it would expose the tort system to a flood of claims based on threats of injuries that might never occur,¹⁸⁰ the courts would have to assess damages for potential risks without any clear guidelines¹⁸¹ escalating

Corp., 225 N.J. Super. 196, 202-03, 542 A.2d 16, 19 (App. Div.) (discussing each of these grounds), *cert. granted*, 113 N.J. 341, 550 A.2d 455 (1988).

170. 106 N.J. 557, 525 A.2d 287 (1987).

171. *Id.* at 583-84, 597-98, 525 A.2d at 300, 307-08.

172. *Id.* at 565, 525 A.2d at 291.

173. *Id.* at 565-66, 525 A.2d at 291.

174. *Id.*

175. *Id.* at 568, 525 A.2d at 292. The toxic agents to which the residents were exposed were numerous. *Id.*

176. *Id.* at 588-89, 525 A.2d at 303.

177. *Id.* at 566, 525 A.2d at 291.

178. *Id.* at 567, 525 A.2d at 292.

179. *Id.* at 597-98, 525 A.2d at 307-08.

180. *Id.* at 597, 525 A.2d at 307.

181. *Id.*

insurance rates would undoubtedly increase,¹⁸² and such claims would be difficult to manage and resolve.¹⁸³

On the other hand, the court recognized that a separate cause of action, arising if and when the disease of which the property owners were at risk actually occurred, was far from the perfect alternative.¹⁸⁴ Those people who subsequently contracted the disease might have substantial difficulty in proving a causal relationship between toxic exposure and their disease.¹⁸⁵ Thus dismissal of the increased risk claims would effectively preclude any recovery for injuries caused by toxic exposure because it would be difficult to prove the injuries manifested in the future were not the product of intervening events.¹⁸⁶ Ultimately, the balance swung in favor of a split cause of action because, under the New Jersey Tort Claims Act,¹⁸⁷ upon which the action was predicated,¹⁸⁸ the court was required to exercise constraint in accepting novel causes of action against public entities.¹⁸⁹

Although splitting the cause of action avoids speculation about a victim's future injuries, it does so at a high cost. Once the insidious disease appears many years after the toxic exposure, the victim may be unable to find a solvent tortfeasor worth pursuing.¹⁹⁰ Assuming

182. *Id.*

183. *Id.* at 597, 525 A.2d at 307.

184. *Id.* at 598, 525 A.2d at 308.

185. *Id.*

186. *Id.* For further discussion of the causation problem, see *infra* note 191 and accompanying text.

187. N.J. STAT. ANN. §§ 59:1-1 to 12-3 (West 1982).

188. *Ayers*, 106 N.J. at 565, 525 A.2d at 291.

189. *Id.* at 598, 525 A.2d at 308. Lower New Jersey courts and federal courts sitting in New Jersey subsequently have split over the issue concerning whether the policy considerations canvassed in *Ayers* apply to the context of private litigants and to claims for quantified increased risks of disease that fall below a fifty-percent likelihood, so as to bar recovery prior to contraction of the insidious disease. Compare *Herber v. Johns-Manville Corp.*, 785 F.2d 79, 81-82 (3d Cir. 1986) (increased risk of future disease claim dismissed because plaintiff's expert did not have epidemiological data showing a class risk exceeding fifty-percent and was not prepared to opine that plaintiff, more likely than not, would contract cancer) and *Pollock v. Johns-Manville Sales Corp.*, 686 F. Supp. 489, 489, 492 (D.N.J. 1988) (present injury of pleural thickening and epidemiological studies demonstrating plaintiff had a forty-three percent risk of contracting lung cancer failed to satisfy the reasonable probability standard of proof and therefore was not a legally cognizable claim) with *Valori v. Johns-Manville Sales Corp.*, Civ. A. No. 82-2686, slip op. at 3-8 (D.N.J. Dec. 11, 1985) (combining present injury of asbestosis and scarred and thickened lungs and pleura with statistical evidence of a forty-three percent risk of dying from lung cancer satisfied the reasonable probability standard of proof) and *Wolozen v. Johns-Manville Sales Corp.*, No. 80-1413, slip op. at 9 (D.N.J. Mar. 21, 1988) (a quantified risk of future cancer of less than fifty percent satisfied the requirements for a valid increased risk claim).

190. See generally Note, *The Genesis of a New Trend: Chapter 11, Avoiding or Managing Future Liability in Mass Tort Actions?*, 15 CAP. U.L. REV. 243 (1986) (describing a trend whereby financially healthy companies facing speculative but potentially massive damages

the victim finds a defendant still in business, he will still be faced with the tremendous burden of proving that his insidious disease was caused by the toxic agent to which he was exposed many years earlier.¹⁹¹ Moreover, a delayed action has no deterrent effect upon the wrongdoer, since the individuals responsible for a toxic exposure are unlikely to be held accountable. Thus an important goal of the tort system is undermined.¹⁹² Furthermore, the victim and society invariably will have incurred tremendous administrative costs in securing legal relief for the immediate consequences of the toxic exposure.¹⁹³

awards for past tortious conduct manipulate Chapter 11 of the Bankruptcy Act of 1978 to avert liability in mass tort actions).

191. In toxic exposure cases, the task of proving causation is aggravated by the extended latency periods of the insidious diseases that the toxic agents may cause. A latency period of ten, twenty or more years is not unusual. *Ayers v. Township of Jackson*, 106 N.J. 557, 585, 525 A.2d 289, 301 (1987). Such periods of time cause enormous practical problems when a victim attempts to gather evidence to prove his case. A further problem results from the fact that there is a certain incidence of the same insidious diseases in parts of the general population who have experienced no toxic exposure. *Id.* Years after a victim's exposure, it is difficult for him to counter the argument that his injuries were the result of intervening causes. *Id.*; see, e.g., *Allen v. United States*, 588 F. Supp. 247 (D. Utah 1984) (radio-active fallout produced by the negligent conduct of open-air nuclear tests was held to have been a substantial factor in causing various cancers in some area residents, but not in others), *rev'd on other grounds*, 816 F.2d 1417 (10th Cir. 1987). One of the central issues in *Allen* was the certainty of the causal relationship between the victims' exposure to nuclear fallout and their later cancers:

The great length of time involved [with insidious diseases] . . . allows the possible involvement of 'intervening causes,' sources of injury wholly apart from the defendant's activities, which obscure the factual connection between the plaintiff's injury and the defendant's purportedly wrongful conduct. The mere passage of time is sufficient to raise doubts about 'cause' in the minds of a legal system accustomed to far more immediate chains of events.

Id. at 406.

The causation problem is graphically illustrated by the litigation surrounding DES. See Biebel, *DES Litigation and the Problem of Causation*, 51 INS. COUNS. J. 223, 226 (1984) ("The DES litigants' special legal problems stem largely from the passage of time between the mothers' ingestion of DES and the discovery of DES-associated abnormalities in their offspring."); see, e.g., *Shields v. Eli Lilly & Co.*, 697 F. Supp. 12, 12-13, 15 (D.D.C. 1988) (interpreting District of Columbia law) (manufacturer of DES granted summary judgment because, despite medical testimony that the plaintiff's injuries would not have appeared without exposure to DES "to a statistical certainty of 97% to 99.7%," the plaintiff could produce no evidence that DES had been prescribed to her mother).

192. The tort goals of deterrence and encouragement of socially responsible behavior work best by encouraging employers to exercise more vigilant control over their servants, be it stockholders over company managers or management over employees. See PROSSER & KEETON, *supra* note 27, at 13. Delaying a right of action until manifestation of an insidious disease allows company management to take a calculated risk that the company will not be held accountable for their corner-cutting practices, if at all, until well after it would harm company profit margins and management careers. Tort law constitutes a residual system of deterrence "by threatening imposition of liability on careless or unduly risky conduct that has not been prevented by market incentives or regulatory controls." *Spring 1988 Progress Report*, *supra* note 60, at 2-3.

193. Approximately sixty to seventy-five percent of the money expended by society to

Such consequences include an acute injury, a reasonable fear of contracting cancer, and a medically recognized need for medical surveillance of the victim's condition.¹⁹⁴ Requiring the victim to bring another action at some point in the future exposes him to yet more administrative costs and the consequent reduction in his actual compensation.¹⁹⁵ Finally, splitting a cause of action does nothing to promote finality between the victim and the wrongdoer; the efficiency of the tort system as a dispute resolution mechanism is thus further undermined.¹⁹⁶

resolve disputes concerning environmental harms and to compensate victims is absorbed as administrative costs. *Spring 1988 Progress Report, supra* note 60, at 3, 13. These costs are largely payments to lawyers. *Id.* at 3, 15.

194. One policy reason that is supposed to favor splitting a cause of action is judicial economy. This reason was first articulated in *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111 (D.C. Cir. 1982) (interpreting District of Columbia law), which involved a claim by the widow of an asbestos worker who died of malignant mesothelioma. *Id.* at 113. Years earlier, the worker had been diagnosed as having asbestosis, and the asbestos manufacturers unsuccessfully argued that the worker's claim for mesothelioma became barred at the same time as his claim for asbestosis. *Id.* at 113-14, 120-21. The United States Court of Appeals for the District of Columbia analyzed the judicial economy considerations as follows:

Upon diagnosis of an initial illness, such as asbestosis, the injured party may not need or desire judicial relief. Other sources, such as workers' compensation or private insurance, may provide adequate recompense for the initial ailment. If no further disease ensues, the injured party would have no cause to litigate. However, if such a person is told that another, more serious disease may manifest itself later on, and that a remedy in court will be barred unless an anticipatory action is filed currently, there will be a powerful incentive to go to court, for the consequence of a wait-and-see approach to the commencement of litigation may be too severe to risk.

Id. at 120.

The initial premise of this analysis does not take into account the judicial formulation of such "anticipatory" actions as those for damages for reasonable fear of future disease and medical surveillance costs; therefore, it is flawed. *But see Anderson v. W.R. Grace & Co.*, 628 F. Supp. 1219, 1232 n.7 (D. Mass. 1986) (interpreting Massachusetts law) (although judicial economy would *not* be advanced by splitting a cause of action, requiring the victim to combine all possible claims in one action would create a precedent requiring other victims to rush to court when they might not otherwise do so).

195. It is widely recognized that high administrative costs undermine the tort system's efficacy as a compensation mechanism. *See Spring 1988 Progress Report, supra* note 60, at 3.

196. Society has an interest in resolving disputes between individuals fairly and promptly. *See PROSSER & KEETON, supra* note 27, at 15-16. Courts that allow a split cause of action acknowledge that splitting does nothing to advance finality between the litigants. *See, e.g., Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 119 & n.41 (D.C. Cir. 1982) (interpreting District of Columbia law) (the wrongdoer has an interest in protecting himself against stale claims and in planning for the future without the uncertainty inherent in potential liability, otherwise he may not make the most productive and socially beneficial use of his resources); *Eagle-Picher Indus., Inc. v. Cox*, 481 So. 2d 517, 521 (Fla. 3d DCA 1985) (permitting the victim to bring a separate action for cancer, if and when it occurs, does not promote finality), *review denied*, 492 So. 2d 1331 (Fla. 1986).

IV. REMEDYING INCREASED RISK CLAIMS BY INSURING THE RISKS TO WHICH TOXIC EXPOSURE VICTIMS ARE SUBJECT

In order to control speculation, to avoid the difficulties of monetarizing future physical injury, to maximize the deterrent effect of tort law, to secure greater judicial efficiency, and to ensure definitive resolution of disputes, courts should recognize claims for significantly increased risk of future disease as claims upon which relief can be granted. The relief, however, should be in the form of a court order awarding the victim insurance coverage of the increased risks of disease to which he has proved he is subject and directing the wrongdoer to pay the premium.¹⁹⁷

A. *Increased Risk of Future Disease Claim Defined*

Under the proposed increased risk cause of action, a victim of toxic exposure should be able to obtain relief whenever he can prove that he has a present injury that is capable of developing into a specific disease or diseases in the future, and that the specific future disease is reasonably probable to occur.¹⁹⁸ In this context, present injury must be defined broadly—consistent with the development of medical science—to encompass the indicia of insidious diseases that can be verified by laboratory tests.¹⁹⁹ Reasonable probability of occurrence must be defined to mean that, based on thoughtful analysis of the medical and scientific evidence, there is a probability²⁰⁰ that the dis-

197. Rosenberg was the first commentator to discuss the possibility of remedying mass exposure cases with insurance funds, either in the form of a fund created and administered by the wrongdoer or in the form of insurance purchased from private insurance companies. Rosenberg, *supra* note 10, at 919-24. The private insurance remedy was subsequently discussed in Note, *Judicial Relief*, *supra* note 43, at 648-52. Numerous courts and commentators have called for legislated mechanisms of public insurance for toxic exposure victims. See *Ayers v. Township of Jackson*, 106 N.J. 557, 598, 525 A.2d 287, 308 (1987); *Ginsberg & Weiss*, *supra* note 10, at 928-40; *Trauberman*, *supra* note 10, at 237-49; *Pollution Victim Compensation*, *supra* note 10, at 612-16.

198. This definition takes into account the fact that we are all exposed to risks in everything that we do. Thus, although there is a statistical risk that a guest in a car who cannot wear a seat belt because the driver has not maintained it properly will be at increased risk of injury, the guest has no claim against the driver because he can show no present injury. See *Kanner*, *supra* note 161, at 356 (banning seat belts while increasing risk of injury for automobile passengers does not necessarily create a demonstrable injury). Similarly, although there is a statistical risk that a person exposed to benzene will develop cancer, a man who pumps gas into his car will have no action for increased risk because he will be unable to produce admissible evidence of subclinical injury.

199. See generally *Kanner*, *supra* note 161, at 353-56 (arguing that the concept of present injury should be defined broadly to reflect advances in medical science).

200. Probability, as used here, means "the relative frequency with which an event occurs in a specified class of elements." H. DENENBERG, R. EILERS, J. MELONE & A. ZELTEN, *RISK*

ease will occur.²⁰¹ Both the requirements of present injury and reasonable probability of occurrence would have to be established by expert testimony that conforms to a substantially accepted explanatory theory.²⁰²

B. *Judicial Adoption of the Insurance Remedy*

Courts cannot respond to advances in science and technology simply by rigidly adhering to traditional doctrine. Courts must fashion remedies to meet rapidly changing needs. In the sphere of claims for increased risk, courts are very concerned about the inherently speculative and conjectural nature of an inquiry into an intangible future loss that may never occur.²⁰³ In the area of toxic exposures, the victim who is told that he has a quantified increased risk of contracting a particular disease could convert such an intangible loss into a tangible loss by taking out insurance on the identified risk.²⁰⁴ The

AND INSURANCE 31 (2d ed. 1974). Probability would not cut off arbitrarily at a frequency constituting "a greater than 50% chance," the definition of reasonable probability or certainty adopted by most courts. See *supra* notes 90-91 and accompanying text. Use of this definition would result in the reversal of the outcome in a case such as *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188 (6th Cir. 1988). The *Sterling* court held that a twenty-five to thirty percent increased risk of disease failed to amount to proof of a "reasonable medical certainty" that the disease would occur in the future. *Id.* at 1205. Under the proposed definition of reasonable probability, a court could award insurance coverage to a victim subject to a twenty-five to thirty percent increased risk of future disease because no arbitrary fifty percent cut-off point would exist. Similarly, the outcome in *Wolozen v. Johns-Manville Sales Corp.*, No. 80-1413, slip op. at 9 (D.N.J. Mar. 21, 1988), which held that a quantified, less than fifty percent risk of future cancer was sufficient to maintain an increased risk claim, would stand. The *Wolozen* court equated the legal probability standard with the mathematical probability standard proposed for the insurance remedy. *Id.*; see also *Pollack v. Johns-Manville Sales Corp.*, 686 F. Supp. 489, 490-91 (D.N.J. 1988).

201. At some point, an increased risk becomes so negligible that no relief should be granted. For a discussion of the vexing problem of drawing the line between what is a compensable risk and what is an uncompensable risk, see *infra* notes 227-34 and accompanying text.

202. If an expert is able to opine, in conformity with a substantially accepted explanatory theory, that subclinical injuries to a victim indicate the presence of an insidious disease, then courts should accept such subclinical injuries as legally cognizable present injuries. See, e.g., *Brafford v. Susquehanna Corp.*, 586 F. Supp. 14, 17, 18 (D. Colo. 1984) (interpreting Colorado law) (the victims produced experts of national renown who opined that the victims had a present injury of chromosomal damage resulting from exposure to radiation). Once the victim establishes such present injury, he must then adduce expert testimony, conforming to a substantially accepted explanatory theory, that he is subject to a medically quantifiable increased risk of contracting a specific disease in the future, in order to be entitled to the insurance coverage remedy.

203. See *supra* notes 33, 44 & 69.

204. See *Cooper*, *supra* note 24, at 224. Rather than apply to an insurance company for specific insurance of his disease risks, the toxic exposure victim, perhaps more realistically, could purchase readily available lines of insurance, such as health care and disability policies, and then claim a proportion of the premiums from the wrongdoer.

insurance policy would provide the victim various benefits in the event the possible future disease became a reality. The victim's tangible loss would be the insurance premium payments. The victim could then bring an action to recover the cost of the premiums from the wrongdoer. In order to justify his action in taking out the insurance coverage, the victim might argue that the cost of the premiums was a reasonable expense in attempting to minimize damages.²⁰⁵ By construing the victim's purchase of insurance as a reasonable attempt to avoid any further harm resulting from the wrongdoer's tortious conduct, the court could order the wrongdoer to pay damages amounting to the cost of the premiums.

The closest analogy to such an approach is the courts' favorable treatment of claims for medical surveillance costs.²⁰⁶ Although courts are adverse to compensating remote risks of serious harm, they are nonetheless willing to compensate victims for the cost of periodic medical checkups designed to detect and to prevent the remote risk of serious harm.²⁰⁷ Medical surveillance costs are considered a reasonable attempt to minimize damages as the early detection of diseases is considered by the medical profession to be the best chance a person has of curing a disease or preventing the disease's most severe consequences.²⁰⁸ Once the intangible risk of future disease is converted into the tangible cost of reimbursement for medical monitoring expenses, judicial fears of gross speculation and conjecture disappear.²⁰⁹

205. Under the avoidable consequences rule, a victim "injured by the tort of another is not entitled to recover damages for any harm that he could have avoided by the use of reasonable effort or expenditure after the commission of the tort." *RESTATEMENT (SECOND) OF TORTS* § 918(1) (1977). Under this rule, it could be argued that any failure on the victim's part to minimize his future losses would bar his recovery with respect to those future losses. There are two difficulties with this approach. The avoidable consequences rule requires both an injury and an avoidable harm. In the case of increased risk, injury would have to be interpreted broadly to include subclinical changes in the body reflected in laboratory tests. Even with a broadened interpretation of injury, however, the plain meaning of avoidable harm would not seem to encompass a possible future disease. The purchase of an insurance policy that would provide financial benefits upon the occurrence of the disease would not help to avoid the disease itself. In response, the victim might argue that the insurance policy constitutes security against the risk of astronomical future medical costs and provides for the cost of medical monitoring for the early detection and therefore the possible cure of the future disease. Such a policy, it could be argued, partially alleviates the victim's fear of future disease, thus further minimizing future damage.

206. *See supra* note 5.

207. *See, e.g., Ayers v. Township of Jackson*, 106 N.J. 557, 599-607, 525 A.2d 287, 308-13 (1987) (claim for an increased risk of cancer based upon an unquantified risk of future harm was rejected, but an award of \$8,204,500.00 for medical monitoring costs, grounded on the same unquantified increased risk, was upheld by the Supreme Court of New Jersey).

208. *See id.* at 603-04, 525 A.2d at 311.

209. *See Cooper, supra* note 24, at 224-25.

An alternative approach to the problem of providing judicial relief to the increased risk claimant would be for the court to exercise its equitable powers to award the victim the right to obtain insurance coverage of the risks of future disease to which he has been exposed and to order the wrongdoer to pay the insurance premium for the coverage. As against the wrongdoer, the relief would be coercive; the wrongdoer would be commanded to make the periodic premium payments and would be subjected to punishment in the event of noncompliance.²¹⁰ The hopeless inadequacy of damage awards, the fundamental fairness of the insurance remedy, the unique nature of the increased risk injury, and the balance of equities justify a court's use of its coercive powers in this area.

An equitable remedy is an appropriate means of dealing with the deficiencies of traditional rules at law.²¹¹ When an award of damages is an inadequate remedy, equity provides an alternative form of relief.²¹² The legal remedies available for increased risk claims have

210. Decrees in equity are in personam orders and coercive in nature. See D. DOBBS, *supra* note 69, at 24-25.

211. In the opinion of one author, "substantive rules of equity were made in response either to unduly rigid legal rules, or to their entire inadequacy, and in each case the substantive rules were purportedly based on higher moral principle." *Id.* at 25.

212. *Id.* at 57. One equitable maxim appropriate here is that "equity does not suffer a wrong to go without remedy." *Id.* at 44 n.24. Traditionally, however, equity refused to act if there was a more or less workable legal remedy—"if the legal right was more or less fair, or if practical alternatives were not shown." *Id.* at 33.

Courts are willing to use their equitable powers in the context of toxic exposure cases. In *Habitants Against Landfill Toxicants v. City of York*, 15 *Env'tl. L. Rep. (Env'tl. L. Inst.)* 20,937 (May 20, 1985), the Pennsylvania Court of Common Pleas held that property owners with wells located in proximity to a city landfill that had leaked hazardous chemicals had sufficiently pleaded a cause of action in equity for the establishment of a constructive medical trust fund to provide funds for the cost of medical monitoring and detection of future medical problems. *Id.* at 20,937-38. The court determined that the property owners had satisfied their burden of alleging the defendant landfill operators' and owners' duty in tort and breach thereof by alleging:

[that] each defendant was involved in the ownership and operation of the landfill, that toxic and hazardous waste was dumped at the site, that during the time defendants were in control certain chemicals were allowed to leak into surrounding properties, and this has created a hazardous health situation to all plaintiffs.

Id. at 20,938. In addition, the court found that the future availability to plaintiffs of an action at law to recover medical expenses was an inadequate and incomplete remedy:

[The state environmental agency] has advised [plaintiffs] not to use their water supply for human consumption because it has been contaminated by hazardous substances emanating from the landfill. Furthermore, the actions of [state and federal environmental agencies] show that the landfill has created a dangerous and hazardous situation, the effects of which may be severe and latent injuries to the plaintiffs.

Id.; see also *Barth v. Firestone Tire and Rubber Co.*, 673 F. Supp. 1466, 1476-78 (N.D. Cal.

been shown to be unworkable and unfair.²¹³ Increased risk claims therefore are ideal for equitable relief. More importantly, however, the proposed insurance remedy is a practical alternative.²¹⁴

C. Insurance Coverage

In the context of a successful increased risk of disease claim, "insurance" would mean an agreement whereby an insurer would agree to indemnify the victim if certain defined risks came to fruition; in return for the provision of an offsetting benefit, the victim would be transferring a potential loss to the insurer.²¹⁵ The arrangement would be structured to provide funds to offset the loss, so that in the event the insurer has to pay, the insured is indemnified by a monetary amount that restores him—as much as money ever can—to his position prior to the injury.²¹⁶

Any insurance remedy would have to provide benefits equivalent to the types of damages available in a successful personal injury lawsuit.²¹⁷ Provision would have to be made for the recovery of economic and noneconomic losses, including medical expenses, reduction of earning capacity, loss of wages, and pain and suffering.²¹⁸ Because

1987) (interpreting California law). In *Barth*, a tire worker was held to have stated a valid claim when he requested equitable relief in the form of a medical fund to pay for a program to gather and distribute information on the diagnosis and treatment of diseases that may result from exposure to toxins used in tire manufacturing and to pay for the early diagnosis of such diseases. *Id.* The tire worker satisfied the court that he had no adequate remedy at law, that he would suffer irreparable harm if the requested relief was not granted, and that he had exhausted all effective legal remedies. *Id.*

213. See *supra* notes 44-196 and accompanying text.

214. The notion of practicality relates to the potential for enforcement problems to arise out of a proposed decree. D. DOBBS, *supra* note 69, at 62. With the insurance remedy, enforcement problems would be minimal. The insurer would draft the policy in accordance with the findings of the court, subject to the court's ultimate approval. A contractually agreed upon arbitration mechanism would resolve disputes as to coverage. Finally, the court could use its contempt powers if for any reason the wrongdoer ceased to pay the premiums.

215. See R. KEETON & A. WIDISS, *INSURANCE LAW, A GUIDE TO FUNDAMENTAL PRINCIPLES, LEGAL DOCTRINES, AND COMMERCIAL PRACTICES* 134-35 (student ed. 1988). It has proved very difficult to expound a generally applicable definition of insurance. *Id.* at 3-5. Professors Keeton and Widiss define insurance as follows: "An insurance contract generally involves an agreement by which one party (usually identified as an insurer) is committed to do something which is of value for another party (usually identified as an insured or beneficiary) upon the occurrence of some specified contingency." *Id.* at 2.

216. See *id.* at 134-35.

217. Three basic kinds of losses are recovered in a successful personal injury action: time losses, expenses incurred by reason of the injury, and pain and suffering. See D. DOBBS, *supra* note 69, at 540. As personal injury damages awards are given in the form of lump sums, the award typically includes an amount for both past losses within these categories and for such losses in the future. *Id.*

218. The insurance remedy would differ from a typical personal injury award in that

pain and suffering has no market value,²¹⁹ the policy could provide for schedules of pain and suffering for different types of diseases.²²⁰

An appropriate insurance policy remedy would narrowly define the specific risks covered.²²¹ These covered risks would be limited to those diseases—proven by the victim to the satisfaction of the jury—that place the victim at a significantly increased risk as a consequence of his exposure to the wrongdoer's toxic agents.²²² Only these possible diseases would be covered risks. The policy explicitly would exclude from coverage any of the listed diseases that are shown to have resulted from a cause distinct from the exposure to the toxic agents.²²³

The insurance policy would also provide for the reimbursement of medical monitoring expenses. Once the jury determined that the need for medical monitoring had been proved, the court order could specify the frequency, timing, and nature of the diagnostic tests that the insurance policy would have to cover.²²⁴ This would then be

benefits would not be paid in one lump sum. The insured would receive reimbursement of his losses as and when they arise. In the case of losses such as reduced earning capacity and pain and suffering, the policy would have to address when to assess these losses. The policy could appropriately provide for a lump sum award for reduced earning capacity and pain and suffering.

219. See D. DOBBS, *supra* note 69, at 545.

220. One writer has included damage scheduling for pain and suffering within a proposal for "Designated Compensable Event" coverage. Pollack, *Medical Maloccurrence Insurance (MMI): A First-Party, No-Fault Insurance Proposal For Resolving The Medical Malpractice Controversy*, 23 TORT & INS. L.J. 552, 577 (1988). The advantage of scheduling pain and suffering damages is that it takes into account the absence of a market for pain and suffering, thus providing the insurer a degree of certainty regarding its likely liability within this area. The predictability of likely losses plays an important function in the fixing of the policy premium. See *infra* notes 235-38 and accompanying text. Additionally, scheduling minimizes the administrative costs of assessing an appropriate level of compensation. The main difficulty is that scheduling necessarily assumes that the same disease will produce the same amount of pain and suffering in different victims. Of course, no two injuries are the same.

221. Insurance policies are generally categorized as either all-risk or specified-risk. R. KEETON & A. WIDISS, *supra* note 215, at 462. The proposed insurance remedy would not create a general health insurance policy—an all-risk coverage—but would provide coverage only for the specific risks described in the policy.

222. See Rosenberg, *supra* note 10, at 920.

223. The disadvantage of a specified risk policy is that the definitions and restrictions are likely to be a fertile area for dispute. One has only to consider the plight of uninsured motorist coverage to realize the inherent risks. Like the proposed insurance remedy, uninsured motorist coverage is a hybrid, first-party coverage of all the insured's potential losses if a defined event occurs. Uninsured motorist coverage is predicated upon the driver at fault being uninsured. The definition and restriction of uninsured motorist coverage has generated a substantial volume of litigation. See R. KEETON & A. WIDISS, *supra* note 215, at 474. For a discussion of the causation problems arising in the context of the proposed insurance remedy, see *infra* notes 261-67 and accompanying text.

224. An alternative type of medical monitoring coverage would provide reimbursement for all medical expenses that the victim's physician certifies as reasonably necessary for the early

incorporated into the insurance policy, and the insurer would fix an appropriate premium.

In addition, the insurance policy would include a provision for the arbitration of disputes between the insured and the insurer over whether a particular injury is a covered injury or the amount of benefits provided. Ideally, the arbitration panel should consist of medical experts, since the most important question before it would be whether the particular injury from which the victim is suffering falls within the definition of the specifically covered disease.

Finally, the insurance policy would have to address whether or not the insurer would be given a right of subrogation to the rights the victim has against the wrongdoer. The better position is that the insurer should have no such right. The context is different from the normal situation in which a right of subrogation exists.²²⁵ Under the insurance remedy, the wrongdoer is paying for the victim's insurance coverage of future risks. In return, the victim is forfeiting any rights he has to bring a future claim arising out of the toxic exposure. Consequently, any rights to which the insurer otherwise would have been subrogated would be extinguished.

D. *Difficulties Arising out of the Insurance Remedy*

There are three significant problems with the adoption of the insurance remedy. The first problem involves the difficulty of defining what risks arising out of a toxic exposure should be compensable. The second problem is that the cost of insuring against risks arising out of toxic exposures may be prohibitively expensive. Finally, there is the problem of establishing causation between the toxic exposure and any disease that subsequently manifests itself. Each of these problems overlap and contribute to the difficulty of the others.

1. IDENTIFYING THE INCREASED RISK

An essential feature of the proposed increased risk claim is that the victim must prove that his exposure to toxic agents has increased his risk of suffering a specific future disease beyond the background

detection of the diseases specifically covered by the insurance policy. One risk of this type of coverage is that the mere existence of insurance could give rise to a demand for services, which would work to the advantage of over-cautious victims and unscrupulous physicians. The approach suggested in this Comment provides the insurer greater certainty as to the amount of its potential future payments and therefore improves the insurer's ability to determine an accurate premium. On the other hand, the restriction on the frequency, timing, and nature of the diagnostic procedures makes no allowance for the particular circumstances of each victim and therefore may be criticized as unfair.

225. See R. KEETON & A. WIDISS, *supra* note 215, at 219-33.

risk—the risk of that specific disease occurring in the general population. This begs the question: how much of an increased risk must the victim demonstrate?

There is no easy answer to this question.²²⁶ The solution to the problem must take into account three important public policies. First, the remedy must mirror community values in an age in which there exists a lack of knowledge about the health impact of modern products and processes.²²⁷ Second, the court should not compensate a plaintiff for a future risk that is supported by so little definitive proof that any damage award would be based on pure speculation.²²⁸ Finally, the judicial system must be shielded from a flood of spurious claims.²²⁹ Undoubtedly, because of the present inchoate understand-

226. Trial courts that have awarded damages for unquantifiable increased risks of disease (usually only to be reversed on appeal) are silent about what constitutes the minimum compensable increased risk. *See, e.g., Sterling v. Velsicol Chem. Corp.*, 647 F. Supp. 303, 321-22, 473-74 (W.D. Tenn. 1986) (trial court held that an increased susceptibility to disease of at least twenty-five to thirty percent was a compensable element of damages, but paid no attention to how far that decision opened the door to potential compensation for much lower risk levels or what the measure of damages would be for such risk levels), *reversed*, 855 F.2d 1188 (6th Cir. 1988). *But see, e.g., Siegel & Salvesen, Sterling v. Velsicol: The Case for a New Increased Risk Rule*, 17 *Envtl. L. Rep. (Envtl. L. Inst.)* 10,155, 10,161 (May 1987) (in discussing the district court opinion in *Sterling*, the authors recommend a cause of action for increased risk of disease subject to proportional recovery, but with a cutoff point, set at what is reasonable in the light of each case, below which the level of increased risk would not be compensable).

227. *See Elliott, supra* note 58, at 785-90. Rather than focusing on an appropriate increased risk standard, Elliott discusses how toxic-tort litigation is primarily concerned with the redefinition of public morality for an era in which society must face up to its incomplete understanding of the relationships between private inventions and public health. *Id.* at 781-82.

228. The scourge of rampant speculation and conjecture has been the motivating force behind all of the judicial restrictions placed upon the action for increased risk. Even those courts most sympathetic to victims exposed to increased risks of disease recognize the need to place a cap on the opportunities for speculation. In *Valori v. Johns-Manville Sales Corp.*, Civ. A. No. 82-2686, slip op. at 3-8 (D.N.J. Dec. 11, 1985), the district court denied the asbestos manufacturers' motion to exclude evidence of a shipyard worker's increased risk of sustaining an asbestos-related cancer, although the worker's proof merely showed that he was a member of an occupational group exposed to a certain level of asbestos of whom forty-three percent would suffer lung cancer. *Id.* The court stated that the precise quantification of the risk of lung cancer satisfied the purpose underpinning the reasonable probability standard: "to maintain . . . the jury's central role in assessing future damages, while culling out only those case [sic] in which the plaintiff is able to produce so little definitive proof to support his claims of future harm that any damage award would necessarily be based on vague speculation." *Id.* at 7.

229. *See, e.g., Schweitzer v. Consolidated Rail Corp.*, 758 F.2d 936, 942 (3d Cir.) (If the mere existence of a subclinical injury triggered a cause of action for personal injuries under the Federal Employers' Liability Act, the federal courts would be inundated with anticipatory claims by healthy railroad workers.), *cert. denied*, 474 U.S. 864 (1985); *Wilson v. Johns-Manville Sales Corp.*, 684 F.2d 111, 120 (D.C. Cir. 1982) (If an individual is diagnosed with a minor toxic exposure injury for which he does not require a judicial remedy, but is also told that he is at risk of sustaining a more serious injury and he may be statute-barred from filing an

ing of toxic chemicals and insidious diseases, wherever the courts draw the line between compensable and noncompensable, exposure-related risks, someone will suffer an injustice.²³⁰

Given the nature of an insurance remedy, the line should be drawn at the point where expert medical testimony, given in conformity with a substantially accepted explanatory theory, cannot quantify as a reasonable probability the increased risk to which the victim has been exposed.²³¹ In those cases in which the state of scientific art is such that the toxic exposure victim cannot quantify his increased risk, the court should apply the next-best remedy, namely the right to pursue an action in the future should the risked disease occur and scientific knowledge and methodology improve. This compromise takes into account the unlimited potential for unfairness and overdeterrence, which would arise if the court granted an insurance remedy, or for that matter a proportional damages remedy, to an individual subject to an increased but wholly unquantifiable risk of future disease.²³²

The success of the proposed remedy depends on the extent to which society can develop reliable scientific estimations of health risks. One exceptional context is asbestos. Over the years since the carcinogenic nature of asbestos was first identified, a remarkable quantity of medical information has been generated concerning the risks of disease connected with varying degrees of exposure to friable

action if and when that injury manifests itself, he will have a powerful incentive to file an anticipatory action.); see also Siegel & Salvesen, *supra* note 226, at 10,161 (emphasizing the need to find a mechanism to weed out spurious increased risk suits once one abandons the requirement that the victim prove that his future disease has a greater than fifty-percent chance of occurring).

230. See *supra* note 229. In the absence of a cutoff point, the allowance of all increased risk claims effectively would create a hypochondriac's charter under which the wrongdoer virtually becomes the victim's health insurer.

231. Use of this test would reverse *DePass v. United States*, 721 F.2d 203 (7th Cir. 1983) (interpreting Illinois law). In *DePass*, the United States Court of Appeals for the Seventh Circuit upheld the district court's denial of damages for increased risk of cardiovascular disease and loss of life expectancy to an individual who had suffered a traumatic amputation of his leg. *Id.* at 203-06. Substantially uncontradicted, the plaintiff's expert cardiovascular epidemiologist testified that, based on a National Institutes of Health study, the plaintiff had a forty-four to fifty-eight percent higher than normal risk of dying from heart disease and a consequent thirty percent reduction in life expectancy. *Id.* at 208-09 (Posner, J., dissenting). Under the proposed remedy, insurance coverage for cardiovascular disease would remedy the plaintiff's increased risk. Providing a remedy for the risk of heart disease would address the problem of systematic underdeterrence raised by Judge Posner in his criticism of the *DePass* majority opinion. *Id.* at 208, 210 (Posner, J., dissenting).

232. Insurance works best with predictable probabilities and not unpredictable probabilities. See *infra* notes 235-38 and accompanying text. Although an insurer could draft a policy covering an unquantifiable risk of disease, the large financial cushion the insurer would have to build into the premiums would have an overly adverse effect on the wrongdoer's business.

asbestos. Asbestos has been associated with a number of so-called signature diseases—rare diseases that can be reliably related to exposure to a particular chemical simply because they have virtually no other known causes.

Other chemicals are more problematic in that they have not been studied in sufficient detail or for a sufficient period of time to enable scientists to assess just what kind of diseases and, a fortiori, what quantum of risk these chemicals pose. Even when there exists scientific information about the health effects of particular toxic agents, the emphasis the proposed remedy places upon quantification of the risk may present an incentive for plaintiffs' attorneys to employ experts who will distort the available evidence in order to present evidence of a quantified increased risk of disease to the court.

In the context of claims for fear of future disease and for medical surveillance costs,²³³ the courts use the flexible concept of reasonableness to distinguish the legitimate claims from the others.²³⁴ Regardless of which test is used, careful application of the present injury and reasonable probability requirements should control any increase in the amount of litigation caused by recognition of the proposed remedy.

2. PRICING THE PREMIUM

Professor Kenneth Abraham wrote: "[I]nsurance deals best with risk, or predictable probabilities, and not with uncertainty, or unpredictable probability of loss."²³⁵ Although it is true that almost any risk is insurable,²³⁶ an effective insurance remedy mandates a price that ensures full compensation to the victim, is fair to the wrongdoer and effects optimal deterrence of the wrongdoer's conduct. These goals are difficult to achieve because of the unpredictability of the risk created by the incomplete scientific understanding of the toxic exposure-future disease equation.

233. See *supra* note 5.

234. See *id.* Nonetheless, there have still been some absurd results. See, e.g., *Clark v. United States*, 660 F. Supp. 1164 (W.D. Wash. 1987) (interpreting Washington law) (victims of exposure to TCE recovered damages for their emotional distress, although there was no actual risk of cancer greater than one excess death in one million, over a seventy-year lifetime of consumption), *aff'd without opinion*, 856 F.2d 1433, 1434 (9th Cir. 1988).

235. Abraham, *Environmental Liability and the Limits of Insurance*, 88 COLUM. L. REV. 942, 946 (1988) [hereinafter Abraham, *Limits of Insurance*]; see also K. ABRAHAM, *DISTRIBUTING RISK: INSURANCE, LEGAL THEORY, AND PUBLIC POLICY* 59 (1986) ("Insurers are risk spreaders not risk speculators.") [hereinafter K. ABRAHAM, *DISTRIBUTING RISK*].

236. See R. KEETON & A. WIDISS, *supra* note 215, at 128.

An insurance company calculates a premium by evaluating the cost of a number of factors with respect to the type of risk to be insured. In the context of toxic exposure-related insidious diseases, the most significant factor the insurer must estimate is the total cost of meeting the losses that might result from the occurrence of the insured diseases, which the insurer has grouped into a pool of risks. This total cost is then reduced by the value of those cases in which the insurer calculates that the insured diseases will not come to fruition.²³⁷ Additional factors include the size of a reserve fund in the event the total risk—in this case the predicted occurrence of insidious diseases within the pool—is underestimated, the insurer's administrative costs of establishing and processing insurance coverage of insidious disease risks, the expenses of doing business, such as marketing this line of insurance, and the insurer's profit margin.²³⁸ The most difficult task facing an insurer providing lines of coverage to victims of toxic exposures is predicting the total cost of the benefits it will likely have to pay out.

The difficulty of predicting the incidence of future disease in a given group of people who have been exposed to toxic agents has already reared its head in the broader context of environmental liability insurance. There is a limited coincidence of problems shared by these two types of coverage. Environmental liability insurance addresses a collection of risks that are of greater variety than the risks addressed by the proposed insurance remedy. Insurance of environmental liability involves the risk that the operation of a venture using hazardous materials will damage natural resources, result in property damage, or cause personal injury or disease.²³⁹ At present, the environmental liability insurance market is in crisis; coverage is either unavailable or only available in return for astronomical premiums.²⁴⁰

One cause of the crisis in environmental liability coverage is the existence of insurance that was not priced in careful correlation to a potential insured's expected losses. The existence of poorly priced insurance enables a potential wrongdoer to externalize risks of liability through the purchase of insurance and consequently results in the reduction of the potential wrongdoer's loss-prevention incentives.²⁴¹

237. *Id.* at 11-12.

238. *Id.* at 12.

239. See Abraham, *Limits of Insurance*, *supra* note 235, at 942 n.1.

240. *Id.* at 943-44. Severe and fundamental problems bedevil the insurance market for environmental liability coverage at a time when the market for other types of liability insurance has stabilized. *Id.*

241. K. ABRAHAM, *DISTRIBUTING RISK*, *supra* note 235, at 17. Potential liability for environmentally caused diseases whose etiology and effects are incompletely understood

Only when science is in a position to predict what forms of exposure to what kinds of chemicals will cause what kinds of disease, will insurers be able accurately to price insurance against toxic tort liability and therefore achieve something approaching optimal deterrence. Such deterrence requires that the potential wrongdoer internalize the cost of premiums that are more attuned to the environmental risks of a particular venture.

The availability of an insurance remedy for toxic exposures ultimately may depend on whether the ability exists to predict potential costs, thus enabling insurers to set premiums at a level that will not expose them to potentially vast liability. Some problems in predicting potential liability in the area of toxic exposure insurance appear in the context of environmental liability coverage. First, the number and severity of injuries, which will be associated with new chemicals, cannot be predicted until experience accumulates.²⁴² Second, the primitive nature of scientific knowledge concerning the hazardous properties of toxic agents adds varying degrees of speculation to risk assessment.²⁴³ Third, the very primitive understanding of the synergism of chemicals that have been mixed together during storage in waste dumps enhances the degree of speculation about the risk.²⁴⁴

probably leads to defendants purchasing more insurance, which because of the paucity of accurate data about expected losses and the prohibitive administrative expenses of applying available data, does not achieve optimal deterrence of the defendants' behavior. *Id.*

242. *See id.* at 46-47 (discussing how the lack of scientific knowledge about the ability of new chemicals to injure people aggravates the insurance actuary's task of predicting the potential cost of furnishing insurance for possible environmental liabilities). Due to the ability of toxic agents to result in insidious diseases that do not manifest themselves until many years later, a useful level of experience regarding the effects of a chemical may not accumulate for many years. *Id.* at 47. Victims, on the other hand, will sue for the acute consequences of toxic exposure shortly after that exposure. One of the posited advantages of the proposed insurance remedy is that the insured will be able to resolve *all* of his claims arising out of the toxic exposure in one action. In the context of exposures to new chemicals, however, this is an illusory advantage because sufficient information as to the increased risk of disease posed by such chemicals is unlikely to be available at the time the victim sues to recover damages for his acute injuries and his fear of cancer. *See Humphreys, An Application of Risk: Pesticides in Toxic Tort Litigation*, 3 *Toxics L. Rep.* (BNA) 696, 700 (Nov. 18, 1987). Indeed, even delaying such a claim until manifestation of the injury most likely will not fill the information gap concerning the effects of the chemicals. Such circumstances present a compelling basis for the creation of statutory no-fault victim compensation schemes. Up to now, however, legislatures have ignored calls for such schemes. *See supra* note 197.

243. K. ABRAHAM, *DISTRIBUTING RISK*, *supra* note 235, at 47.

244. *Id.* Lack of knowledge about the synergistic effects of chemicals that become mixed together was one of the problems faced by the plaintiffs' medical experts in *Ayers v. Township of Jackson*, 106 N.J. 557, 588-89, 525 A.2d 287, 303 (1987). In *Ayers*, a variety of toxic chemicals had been dumped at a city landfill. *Id.* at 565, 525 A.2d at 291. Local residents were exposed to these chemicals when they leached through the ground and into the well water supply. *Id.* The Supreme Court of New Jersey upheld the dismissal of the residents'

Finally, the effect of economic inflation—during the latency of the covered disease—upon the future cost of the benefits that the insurer will eventually have to pay for, is largely unknown.²⁴⁵ The essence of the problem is that the insurer suffers from the same quantitative information gap about the hazards of toxic chemicals as the potential victim, the potential wrongdoer, the courts, the medical experts, and the government.²⁴⁶

Although the proposed insurance remedy shares some of the pricing problems found in the sphere of environmental liability insurance, there are significant differences that, while increasing the unpredictability of assessing potential environmental liabilities, do not have a parallel effect upon the risks the proposed remedy will address.

claim for increased risk of cancer and other diseases on the ground that a significantly enhanced but unquantified risk of future disease was too speculative to give rise to a cause of action under the New Jersey Tort Claims Act. *Id.* at 598-99, 525 A.2d at 308. Plaintiffs' medical experts opined that the significantly enhanced risk of disease was unquantifiable because of limited knowledge about the synergistic effects of the chemicals to which the residents had been exposed. *Id.* at 588-89, 525 A.2d at 303.

The synergism of chemicals also causes difficult problems when the victim is exposed to chemicals from two different sources, and those chemicals act synergistically to produce a greater injury than each chemical would have caused on its own. For example, cases involving a smoker who claims damages for future injuries arising out of exposure to asbestos fibers are frequently litigated. *See, e.g.,* *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1138-39 (5th Cir. 1985) (holding testimony about smoking admissible because it "related directly to the extent of damage caused by the inhalation of asbestos fibers.").

245. K. ABRAHAM, *DISTRIBUTING RISK*, *supra* note 235, at 47. Because insidious diseases can undergo extended periods of latency, an insurer underwriting toxic exposure cases will have to build a margin of error into the price of the insurance policy to take into account the potential changes in economic conditions over the years. An additional consequence of such extended latency periods is that the insurer will not know for a long time whether the company's predictions of potential future claims are economically sound. *Id.* at 47. Given the long period of time that may elapse before any claims are brought, it may be too late to avoid suffering a large loss by adjusting premiums and actuarial data. One counterbalancing advantage, from the insurer's perspective, of potentially lengthy latency periods is that the delay between payment of premiums and the provision of any insurance benefits allows the insurer greater time to maximize the income by investing the amounts received as premium payments.

The dilemma of adequately funding a benefit that may not be paid until far into the future is equally problematic in the sphere of long-term care risk insurance. *See* Bell, *Financing the Long-term Care Risk*, XLII J. AM. SOC'Y C.L.U. & C.H.F.C. 72 (1988). The prevalence of functional impairment among the elderly is a relatively new phenomenon and health care insurers lack actuarially sound data for evaluating the long-term care risk. *Id.* at 73. The challenge to insurance markets presented by potential diseases arising out of toxic exposure is similar to the challenge presented by long-term care risks: "to provide actuarially sound [insurance] at affordable prices covering a risk that has both a high probability of occurring and a high potential severity in terms of cost." *Id.*

246. In the area of environmental liability, insurance companies are in no better position than anyone else to evaluate risks and thus to price premiums because of the acute lack of quantitative information about the dangers of toxic chemicals. *See* K. ABRAHAM, *DISTRIBUTING RISK*, *supra* note 235, at 48.

Consequently, the insurability of the specific risks arising out of toxic exposure will be that much greater than the insurability of the risks of environmental liability arising out of the operation of a given venture. One of the greatest unknowns in environmental liability insurance is the tremendous unpredictability of changes in the legal doctrines supporting greater liability or recovery.²⁴⁷ Because the proposed insurance remedy will only be triggered when the liability of the wrongdoer has been established, the dynamics of the proposed remedy will not depend on the relative stability of a limited number of mercurial legal doctrines. As such, it is a much more predictable and thus insurable risk.

Another unknown in the realm of environmental liability insurance not shared by the proposed insurance remedy is the unpredictability arising out of the fact that "toxic tort disasters tend to be catastrophic in scope and sporadic in occurrence."²⁴⁸ The problem of risk assessment in the area of the proposed insurance remedy presents a much narrower predictability problem: the court already will have made a determination of the wrongdoer's liability to a defined group of victims and of the disease-risks to which they have been exposed. The court, moreover, will spell out the categories of benefits any insurance will have to cover. At a minimum, the potential insurer will be able to calculate the maximum potential losses that might arise from the coverage because, unlike environmental liability coverage, the identity of the maximum number of individuals entitled to policy benefits is known in advance.

The final area of unpredictability of environmental liability insurance relates to the determination, based on the most up-to-date scientific information, of when, how, and to what extent any of the insured risks will come to fruition. Calculating the frequency of risk realization will be less uncertain in the context of the proposed remedy than

247. *Id.* at 46-49. Such "legal inflation"—changes in doctrine supporting greater liability and recovery—is very damaging to the process of calculating the costs of insurance. *Id.* One effect of the unpredictability of environmental liability has been the demise of "occurrence policies" and the increased use of "claims-made" policies. *Id.* at 49-51, 58-59. See generally R. KEETON & A. WIDISS, *supra* note 215, at 598-99 (discussing the reasons for and the consequences of the shift to claims-made policies in the areas of professional liability and comprehensive general liability policies). Insurers have shifted away from policies predicated upon the occurrence of an event within a specified time period, with no limitation with regard to when losses are sustained. K. ABRAHAM, *DISTRIBUTING RISK*, *supra* note 235, at 50. Instead, insurers offer coverage limited to actual claims made during the policy period. *Id.* The advantage of the claims-made policy is that the insurer only needs to predict the extent of its insured's exposure to claims that will be made during the defined policy period, thus avoiding the prediction of long-term claim exposure. *Id.*

248. K. ABRAHAM, *DISTRIBUTING RISK*, *supra* note 235, at 47.

in the context of environmental liability insurance because the insurer, in the former context, will have available considerable information concerning the degree and type of exposure, the identities of the toxic agents involved, and the personal circumstances and characteristics of the insureds.²⁴⁹

Of course, there are factors unique to the insurance of toxic risks that are not reflected in other areas of insurance and that are likely to impact adversely the cost of the proposed insurance remedy. The most significant of these factors, in terms of the potentially devastating effect on the price of premiums, is the limited ability of the insurer to distribute the risks of loss associated with the proposed remedy. Risk distribution is an approach utilized by insurers to achieve risk management.²⁵⁰ When there is uncertainty as to whether a particular insured will suffer a loss covered by the insurance policy, the insurer can control the impact of the uncertainty by pooling or combining similar types of risks of loss into one group.²⁵¹ As the number of pooled ventures increases, the relative dispersion of potential outcomes lessens; stated differently, "there is a greater likelihood that the favorable and the harmful experiences will tend to be balanced."²⁵² Although risk distribution does not improve the insurer's ability to predict whether any insured will sustain a covered loss—indeed it increases the insurer's absolute risk—spreading the risk over a great number of similar ventures tends to assimilate the potential dispersion of outcomes to the actuarially-calculated average.²⁵³

The insurance of the identified risks arising out of a toxic exposure, however, presents little opportunity for risk distribution. Effective risk pooling depends on identifying large numbers of individuals who participate in similar activities and therefore who are subject to similar risks.²⁵⁴ The weakness of the court-ordered insurance remedy

249. The insurer could access the court record to obtain information relevant to the assessment of the risks it was contemplating insuring.

250. See generally R. KEETON & A. WIDISS, *supra* note 215, § 1.3 (discussing the concepts of risk and risk management underpinning insurance transactions).

251. *Id.* at 12.

252. *Id.* at 12-13. The classic example of this phenomenon is flipping a coin: "the percentage of heads and tails in the flipping of a coin tend to stay more nearly in balance as the number of tosses of the coin increases." *Id.* at 13 n.11.

253. See *id.* at 12-13.

254. K. ABRAHAM, *DISTRIBUTING RISK*, *supra* note 235, at 62. Although numerous cases regarding toxic exposure have been brought in recent years, the number of people exposed to toxic agents and the consequent increase in the risk of sustaining an insidious disease is a mere drop in the ocean. Thus the potential market is nothing like, for example, the relatively untapped market for long-term disability or catastrophic illness insurance. See Bell, *supra* note 245, at 72 ("Approximately 20 percent of the nation's elderly have chronic illnesses, and 40 percent will enter a nursing home sometime during their life.") Insurers will be forced to

is that the identification of similarly situated individuals subject to similar risks depends on prior court adjudications of the degree of risk, and more importantly, on the liability of the wrongdoer. Case-by-case adjudication of an individual's enhanced risk claim is hardly conducive to the speedy establishment of large risk groups.²⁵⁵ The size of any particular class of similarly situated toxic exposure victims, across which an insurer could distribute the risk of loss, would depend on the number of lawsuits adjudicated by the court or settled by the parties.²⁵⁶ In the event that the insurer may not be able to distribute the risks it is assuming across a sufficiently large pool of insureds, the insurer may be able to secure the appropriate degree of risk distribution by reinsuring part or all of the risk with another insurer.²⁵⁷ Another factor that is likely to increase the price of the insurance remedy is the customized coverage required for an individual victim's risks; customization means incurring the additional administrative expense of individualizing the transaction.²⁵⁸ Custom-

charge higher premiums because of the limited scope for risk pooling in the area of toxic exposures.

255. The insurance remedy would function most effectively in class actions filed immediately upon discovery of mass exposure. See Rosenberg, *supra* note 10, at 920. See generally Rosenberg, *Class Actions for Mass Torts: Doing Individual Justice by Collective Means*, 62 IND. L.J. 561 (1987) (demonstrating how mass tort class actions achieve the tort goals of compensation and deterrence more effectively than case-by-case adjudication).

256. Class actions, however, do improve the insurer's ability to pool the risks arising in toxic exposure cases. The facts of *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188 (6th Cir. 1988), are a good illustration. In *Sterling*, a total of 103 local residents brought tort actions against Velsicol, the owner of a waste burial site, to recover compensatory and punitive damages. *Id.* at 1193-94. The local residents alleged that they had sustained injuries after drinking water drawn from wells that, unknown to them, had become contaminated with carbon tetrachloride and chloroform from Velsicol's waste burial site. *Id.* The district court consolidated the cases by certifying a class action pursuant to Rule 23 (b) (3) of the Federal Rules of Civil Procedure. *Id.* at 1194. The class action then proceeded to trial with five representative plaintiffs. *Id.* The Court of Appeals for the Sixth Circuit reversed awards of damages for the five plaintiffs' increased risks of future diseases on the ground that "an increased risk for susceptibility to cancer and other diseases of only twenty-five to thirty percent . . . does not constitute a reasonable medical certainty." *Id.* at 1205.

From the perspective of the proposed insurance remedy and the opportunity for risk distribution, an insurance company is likely to be much more willing to insure a pool of 103 individuals with risks of disease ranging from twenty-five to thirty percent than the case in which one individual seeks insurance for his twenty-five to thirty percent risk. If the insurance company insures the latter risk, it likely would add a considerable amount to the premium to compensate for the wide dispersion of possible outcomes, which raises questions about the fairness of charging the wrongdoer for this uncertainty.

257. The reinsurance market allows an insurer to attain an appropriate degree of risk distribution by transferring part of the risk undertaken to another insurer or group of insurers. See R. KEETON & A. WIDISS, *supra* note 215, at 13.

258. See generally R. KEETON & A. WIDISS, *supra* note 215, at 118-20 (outlining the advantages of standardized insurance policies).

ized coverage will be necessary because different victims will be at risk of developing different diseases and different victims will be at risk of incurring different income loss. The specific risk policy will cover only those diseases to which the court has determined the victim is at risk. Moreover, if the insurance remedy is to provide benefits equivalent to the types of damages available in a personal injury action, then the policy will have to cover the individual victim's potential loss of income.

Other factors unique to the toxic risks addressed by the insurance remedy effectively will increase the price of coverage. Because payable benefits will have to be equivalent to the damages available in a personal injury suit, the insurance coverage will have to reflect the principle that the victim must be placed as nearly as possible in the position he would have been in had the injury not occurred.²⁵⁹ As a result, the insurer cannot incorporate into the policy a limitation of the maximum amount payable. The insurer necessarily will have to make provision in the size of the premium for this potential opened liability.²⁶⁰ Ultimately, the justification for requiring the wrongdoer to pay the premium, whatever it costs, is society's interest in deterring people from exposing others to toxic agents.

3. ESTABLISHING CAUSATION

Any insurance remedy will have to address the question of causation. Once the victim is granted insurance coverage for identified risks, it must be determined when the insurance company must pay. Stated differently, the issue becomes: may an insurance company refuse to pay benefits to a victim, who develops a disease listed within the terms of the policy, on the grounds that the particular disease was not caused by the prior toxic exposure? This problem might arise in several contexts. The insurer could challenge a victim's entitlement to benefits on the basis that the victim's disease falls within the normal background incidence of that disease,²⁶¹ that the disease resulted

259. D. DOBBS, *supra* note 69, at 540.

260. Even uninsured motorist coverage contains a financial limit on liability. See R. KEETON & A. WIDISS, *supra* note 215, at 406; Insurance Services Office, Personal Auto Policy (Ed. 1985) at 5, reprinted in R. KEETON & A. WIDISS, *supra* note 215, at 1121, 1125. Uninsured motorist coverage is first-party insurance, under which the insurer contracts to pay the insured the damages he would have been legally entitled to recover from another motorist, but for the latter's lack of insurance. R. KEETON & A. WIDISS, *supra* note 215, at 399.

261. See, e.g., Humphreys, *supra* note 242, at 696 (Even for those pesticides whose toxicity characteristics or mode of use made them relatively detectable after application, proving causation is very difficult because "immediate symptoms suffered by plaintiffs alleging pesticide injuries often mimic those common in the general population.").

from an intervening event, such as another toxic exposure, or that the disease has concurrent causes, one or more of which is not related to the prior toxic exposure.²⁶²

Precisely because these causation problems are virtually insoluble,²⁶³ the insurance remedy must provide a mechanism for addressing them in a manner that will not provoke vexatious litigation and wasteful costs. The insurance policy would have to provide that, once the victim demonstrates, by medical evidence, that he has one of the specific diseases listed in the policy, a presumption of coverage would arise.²⁶⁴ In addition, the policy could require that an arbitration panel of medical experts resolve any disputes as to whether the victim is suffering from a covered disease and therefore entitled to benefits. The insurer would have the burden of proving that the victim's disease was caused by an event other than the toxic exposure; thus any doubt as to causation would be resolved in favor of coverage. Of course, the insurer will charge a higher premium, and the wrongdoer will carry the extra financial burden. The advancement of the tort goal of deterrence, however, justifies the imposition of this additional burden upon the wrongdoer.

E. *Advantages of Insuring Risks of Future Disease*

The objectives of the tort system are to compensate fully victims'

262. Both cigarette smoking and exposure to asbestos fibers have been associated with lung cancer. See EVALUATION OF CARCINOGENIC RISKS TO HUMANS, *supra* note 58, at 107, 359. Consequently, the parties to asbestos litigation hotly dispute the cause of the victim's cancer. See, e.g., *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1139 (5th Cir. 1985) (holding that the jury must decide whether the insulation warehouseman's increased risk of cancer was caused by smoking, asbestos exposure, or both).

263. Courts have adopted a variety of mechanisms to sidestep intolerable causation problems. See, e.g., *In re Agent Orange Product Liability Litigation*, 689 F. Supp. 1250, 1257-58 (E.D.N.Y. 1988). Under the settlement distribution plan arising out of the litigation surrounding the exposure of Vietnam veterans to dioxin-contaminated herbicides, to qualify for benefits a veteran must show: (1) service in an area where agent orange was used, (2) disability as defined by the Social Security Act, and (3) injuries that are not accidental, traumatic or self-inflicted. *Id.* The qualificatory requirements specifically do not address causation, thus minimizing administrative costs. *Id.*

264. The success of insuring specific listed diseases will stand or fall on how well the insured event can be defined. Administrative compensation schemes for product and process injuries share the difficulty of defining the compensable event in a manner that avoids causation problems. See Abraham, *The Insurance Implications of Administrative Compensation Schemes*, 25 HOUS. L. REV. 817, 818-21 (1988). A general definition of the compensable event will raise the cost of the remedy. *Id.* at 818-19. On the other hand, a narrow definition of the compensable event will create difficult borderline areas of dispute. *Id.* at 819. In addition, "it is difficult to define a compensable event before one becomes aware of the existence of a set of injuries or diseases that might be included." *Id.* at 820.

injuries and to deter efficiently wrongdoers' tortious activities.²⁶⁵ In the context of torts arising out of toxic exposures, the system can only attempt to approximate this goal because of our limited scientific understanding of the relationships between contact with a chemical and the subsequent manifestation of an insidious disease such as cancer. The development of an insurance remedy for increased risks of future disease constitutes the best approach, available today, to achieving the tort system's objectives, by combining the best features of the court system with some of the best features of the administrative process.²⁶⁶ The insurance remedy has numerous advantages over the alternatives presently posited by the courts,²⁶⁷ including, but not limited to, more just determination of compensation, more efficient deterrence, and reduced costs.

First, instead of compensating the victim of a toxic exposure for the chance of a future disease, the proposed remedy establishes a collection of insurance benefits for those victims who can prove that they have been exposed to a quantifiable increased risk of disease. Nobody receives a windfall. Only those toxic exposure victims who cannot prove any quantified increased risk of disease because of the state of current scientific art remain uncompensated. The wrongdoer cannot complain about the proposed insurance remedy. Although the wrongdoer undoubtedly will be paying for insurance coverage for some individuals who are exposed to toxic agents, but who do not manifest any subsequent injury, the assault to the exposure victim's dignity occasioned by the wrongdoer's tortious actions in exposing the victim to a potential carcinogen justifies such a burden.

Second, the wrongdoer's immediate liability for the premium would advance the tort goal of deterrence,²⁶⁸ without overdeterrence, because only those victims who eventually developed the insidious diseases would recover under the policy. As such the proposed insur-

265. See *supra* note 35.

266. One of the themes running through Professor E. Donald Elliott's analysis of increased risk claims and hybrid compensation schemes is that future debate on the issue of how best to deal with hazardous waste in the environment should concentrate on developing institutional arrangements that combine the best features of the courts and the administrative process. Elliott, *supra* note 58, at 783.

267. See *supra* notes 44-196 and accompanying text.

268. See R. POSNER, *LAW AND ECONOMICS* 190 (2d ed. 1986) (the basic function of law, in an economic perspective, is to alter incentives); Calabresi, *Optimal Deterrence and Accidents*, 84 *YALE L.J.* 656, 656 (1975) (examining the meaning of "the fault system" and "strict liability" in the context of the "goal of minimizing accident and accident prevention costs"). See also Rosenberg, *supra* note 10, at 919-20 ("failure of the courts to establish the defendant's liability to all risk victims would, for a variety of reasons, substantially frustrate the system's deterrence and compensation objectives.").

ance remedy would eliminate over- and undercompensation far more effectively than any remedies currently provided by the judicial system.

Third, the private insurance remedy would lead to substantial savings in judicial resources. It would eliminate the large costs involved in the process of attempting to determine and to distribute compensation for risks of future disease.²⁶⁹ Insurance companies initially would bear the distribution costs, but would pass them on to the wrongdoer by charging a higher premium. These distribution costs would be limited to the expense of awarding compensation to the proportion of toxic exposure victims who actually contracted the identified disease.²⁷⁰ Other savings in judicial resources would arise from courts not having to furnish a number of victims two opportunities to sue the wrongdoer: one for the acute injuries provoked by the toxic exposure and a second for the subsequently manifested insidious diseases arising out of the exposure. The doctrine of *res judicata* would preclude a victim who brings an action for increased risk of disease from subsequently instituting an action upon the manifestation of latent injuries.

Fourth, the private insurance remedy would address productivity problems concerning the application of statutes of limitation and the single cause of action rule. Liability could attach as soon as medical experts were able to quantify the risk as something above *de minimis*, thus utilizing the freshest, most available evidence of tortious conduct and causation.²⁷¹

Fifth, the private insurance remedy would encompass the costs of medical surveillance for the early detection of insidious diseases.²⁷² At present, when a court concludes that medical monitoring is justified, it invariably orders the establishment of a court-administered fund.²⁷³ Shifting the responsibility for administering medical monitoring funds from the courts to private insurance schemes would relieve the courts of this obligation and thus result in a substantial saving of judicial resources.

Finally, because insurance provides the psychological benefit of reassuring toxic exposure victims that they have coverage against cat-

269. See Rosenberg, *supra* note 10, at 922.

270. *Id.*

271. *Id.* at 923.

272. See *supra* note 224 and accompanying text.

273. See, e.g., Burns v. Jaquays Mining Corp., 156 Ariz. 375, 381, 752 P.2d 28, 34 (Ct. App. 1988); Ayers v. Township of Jackson, 106 N.J. 557, 608, 525 A.2d 287, 314 (1987).

astrophic future illness,²⁷⁴ the court could instruct the jury to take this factor into account when calculating an award for fear of future disease. Because the victim who is able to prove a quantified increased risk of future disease would recover under the insurance remedy, the jury would no longer face the temptation to take into account the victim's exposure to a risk of future illness in calculating damages for fear of disease. The net result would be a reduction in the size of recovery for fear of disease claims.

V. CONCLUSION

Current tort doctrine does not permit recovery for a quantifiable increased risk of future disease if the disease cannot be stated to be more likely than not to occur. The essential reason for this is that judicial remedies are still hidebound by tort doctrines that were formulated long before scientific advances nudged the legal system toward the field of toxic torts and the analysis of insidious disease causation. Once courts recognize that they do not have to address this problem using the traditional all-or-nothing damages approach, they should be more receptive to countenancing claims for quantifiable increased risk of future disease. Using their equitable powers, courts may grant an award of limited insurance coverage to the toxic exposure victim. With one sweep, the courts will have begun to address problems of valuation, over- and undercompensation, and fairness to the parties, without doing violence to the purposes of tort law.

DAVID P.C. ASHTON

274. See Note, *Judicial Relief*, *supra* note 43, at 650.