Public Health Funds: The Next Step in the Evolution of Tort Law

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Each year, in our country, 700,000 persons contract cancer.¹ Scientists estimate that seventy to ninety percent of those persons are victims of toxic exposure.² Human exposure to toxic substances results from the commonplace usage of untested toxic chemicals,³ the high percentage of improper disposals,⁴ chemical accidents,⁵ and sudden uncontrolled releases.⁶ This mass proliferation of human exposure and resulting harm has led to the creation of the field of toxic torts.⁷

Toxic torts have several unique characteristics—the long latency and the scientific uncertainty of exposure related diseases—which have created a number of insurmountable legal and practical barriers to recovery.⁸ These barriers include statutes of limitations, the single
cause of action rule, and proof of causation. As government action has done little to eradicate these barriers. As a result, the basic purposes of tort law—compensation of victims of wrongful conduct and deterrence of future tortious conduct—are frustrated.

In response, traditional tort principles have been adapted and courts have recognized several innovative damage theories. These theories include fear of future illness, enhanced risk of future illness, medical monitoring damages, and the public health fund. The most successful innovative damage theory is medical monitoring damages founded on legal, medical, and public policy principles. The public health fund is an adaptation of medical monitoring damages, which has recently been considered by several jurisdictions and utilized successfully in private settlement actions. A public health fund is a fund that studies, develops, and distributes scientific data on the effects of toxic exposure on humans.

This Comment addresses the adaptability of tort law, its past evolution, and its necessary future evolution. Section II of this Comment examines the unique characteristics of toxic torts—the long latency

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10 Legislative action has failed to provide a viable means of recovery for toxic tort victims. See Blumenberg, supra note 7, at 675–76; Slagel, supra note 8, at 857.


13 Slagel, supra note 8, at 859–59; Dore, supra note 12, § 7.01 at 7–2. Less commonly asserted theories are impaired quality of life and loss-of-chance. Slagel, supra note 8, at 859.


15 See Slagel, supra note 8, at 858, 862.

16 See, e.g., Cook, 778 F. Supp. at 515 (district court stated that public health fund is complement and consistent with public policy principles of medical monitoring damages); Barth, 673 F. Supp. at 1476, 1478 (district court recognized plaintiff's claim for the creation of public health fund); In re Three Mile Island Litig., 557 F. Supp. 96, 97 (M.D. Pa. 1982) (public health fund designed to "finance studies of the long term health effects of the TMI incident. . .").

17 See, e.g., Cook, 778 F. Supp. at 514–15 (plaintiffs sought public health fund that gathered and distributed scientific data on exposed class); Barth, 673 F. Supp. at 1476 (public health fund was a fund to develop general scientific data on diagnosis and diseases related to benzene exposure); In re Three Mile Island, 557 F. Supp. at 97 (public health fund designed to finance specific and general health studies).

18 See infra notes 53–56 and accompanying text.
and scientific uncertainty of exposure-related diseases. Section II also reviews traditional tort doctrines which virtually prohibit recovery in toxic tort cases—the statute of limitations, the single controversy rule, and standards of causation. Section III examines the early innovative damage theories developed to accommodate toxic torts—fear of future illness and enhanced risk of illness. Then this Section examines the most successful innovative theory, medical monitoring damages, including its legal, medical, and public policy foundations. Finally, Section III considers public health funds, a new theory of damages that has been considered in a few courts and very successfully implemented in private settlement actions. Section IV concludes that the essential next step in the evolution of tort law is the recognition of public health fund damages. Public health funds are necessary to reincorporate compensation and deterrence into tort law.

II. TOXIC TORT RECOVERY IS SEVERELY HINDERED UNDER TRADITIONAL TORT DOCTRINE

Ordinary cleaning supplies, such as disinfectants, bleach, fabric softeners, spot removers, and polishes, all contain hazardous ingredients. Chemicals and hazardous substances are commonplace in every sector of our economy and in every home in the United States. In 1983, The Occupational Safety and Health Administration (OSHA)

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19 See infra notes 57–77 and accompanying text.
20 See infra notes 78–81 and accompanying text.
21 See infra notes 82–108 and accompanying text.
22 See infra notes 109–19 and accompanying text.
23 See infra notes 120–43 and accompanying text.
24 See infra notes 184–88 and accompanying text.
25 See infra notes 189–205 and accompanying text.
26 See infra notes 206–27 and accompanying text.
27 See infra notes 232–316 and accompanying text.
28 See infra notes 317–76 and accompanying text.
29 See infra notes 377–443 and accompanying text.
30 See infra section V.
31 Lyndon, supra note 5, at 1801 n.11 (citing M. Greenberg & R. Anderson, Hazardous Waste Sites 4 (1984)).
32 "Toxic substances are any chemical, biological, biochemical or radioactive materials that cause an immediate or long-term harm to people, animals or the environment. Examples of toxic substances include: Asbestos, Agent Orange, Benzene, Diethyestibestrol (DES), Dioxin, Formaldehyde, Radiation, and Vinyl Chloride." Slagel, supra note 8, at 849 n.1; see also, David Rosenberg, The Causal Connection in Mass Exposure Cases: A "Public Law" Vision of the Tort System, 97 Harv. L. Rev. 851, 851 n.2 (1984).
33 See In re Paoli Railroad Yard PCB Litig. v. Monsanto Co., 916 F.2d 829, 850 n.22 (3d Cir. 1990), cert. denied, 111 S. Ct. 1584 (1991); Blumenberg, supra note 7, at 661–62; Developments in the Law, supra note 11, at 1462; Lyndon, supra note 5, at 1800–01.
estimated that over 575,000 chemical products existed and were utilized, in this country. Additionally, 1,000 new hazardous chemicals are developed and distributed each year. Of these, more than 65,000 chemicals are untested concerning their effects on the environment or human health. In 1978, the United States produced 320 billion pounds of synthetic organic chemicals. The Senate Committee on Environment and Public Works found that more than ninety percent of all hazardous chemical wastes produced in the United States were disposed of improperly.

This massive, commonplace use of untested toxic chemicals, in conjunction with the extremely high percentage of improper disposal, chemical accidents, and "sudden uncontrolled releases" has resulted in the emergence of a new field of law—toxic torts. Toxic torts are the legal actions arising when a person is exposed to toxic substances and harm results.

A. The Unique Nature of Toxic Torts

Traditional tort law compensates people who are injured by the wrongful conduct of others. For example, if a defendant runs a stop sign, hits the plaintiff's car, and causes the plaintiff injury, such as a physical injury, the plaintiff can sue the defendant for damages under the theory of negligence. However, in toxic tort cases, the plaintiff is exposed to toxic substances, and the injury results from that exposure. The plaintiff must prove that the defendant was negligent in the handling or disposal of the toxic substance, or that the defendant was aware of the toxic nature of the substance and failed to take reasonable precautions to prevent exposure.

Gara, supra note 3, at 265. Other statistics indicate that 80% of the 48,000 chemical substances in general commercial use have no available data as to toxicity. See Lyndon, supra note 5, at 1803 (citing National Research Council, Toxicity Testing: Strategies to Determine Needs and Priorities 14 (1984)). Toxicity is the science of poisons and their effects. American Law Inst. Reporters' Study, Enterprise Responsibility for Personal Injury 321 (1991) [hereinafter 2 American Law Inst.]. The National Research Council estimated that adequate information to make an accurate risk assessment is available in only 10% of pesticides, 2% of cosmetic ingredients, 5% of food additives, and 18% of drug ingredients. Lyndon, supra note 5, at 1803 (citing National Research Council, Toxicity Testing: Strategies to Determine Needs and Priorities 12 (1984)).
This was an increase from 1.3 billion pounds in 1940. Lyndon, supra note 5, at 1799 n.9 (citing R. Nader et al., Who's Poisoning America 5 (1981)).
Gara, supra note 3, at 265.
See Ayers, 525 A.2d at 298 (citing S. Rep. No. 848, 96th Cong., 2d Sess. 3 (1980) (citing EPA estimates)).
Lyndon, supra note 5, at 1800-01.
Id.
See Blumenberg, supra note 7, at 661.
Prosser & Keeton, supra note 11, § 2 at 6.
broken leg, the plaintiff may bring a negligence tort action against the defendant. If the plaintiff can prove that: the defendant had a duty or obligation to conform to a specified standard of conduct; the defendant failed to conform to that required duty or standard; there existed a reasonably close causal connection between the defendant’s conduct and the resulting injury; and an actual loss or damage resulted, the defendant must compensate the plaintiff for the resulting injury.46

Toxic torts actions, by analogy, seek to compensate persons exposed to hazardous substances who suffer an injury due to the conduct of another.47 Four theories of recovery are utilized by toxic tort victims: negligence, nuisance, strict liability, and trespass.48 The most commonly used is negligence.49 To prove negligence the plaintiff must show that the defendant was under a duty to conform to a standard of conduct; that the defendant breached that standard; that there was a reasonably close connection between the conduct and the resulting injury; and that the plaintiff suffered an actual loss.50 Toxic torts, however, have unique characteristics which frustrate recovery under these traditional tort remedies.51

Toxic torts have two unique characteristics which distinguish them from traditional tort cases—the long latency and scientific uncertainty of exposure-related diseases.52 These characteristics create virtually insurmountable legal and practical barriers to recovery for victims of toxic exposure. Prior to examining the legal and practical barriers to recovery, a brief explanation of the unique characteristics of toxic torts is necessary.

Injuries or illness resulting from toxic exposure are often latent—undetectable for a period of time after exposure.53 While a broken leg

46 Id. § 30 at 164–65.
47 Id. § 2 at 6.
49 Ayers v. Township of Jackson, 525 A.2d 287, 300–01 (N.J. 1987); see also Developments in the Law, supra note 11, at 1610–11; Blumenberg, supra note 7, at 672; Foster, supra note 48, at 146.
50 PROSSER AND KEETON, supra note 11, § 30 at 164–65. See also Ayers, 525 A.2d at 301.
52 See Blumenberg, supra note 7, at 667.
53 The latency period is the interval between a person’s exposure to the toxic substance
may be diagnosed immediately, toxic exposure injuries, such as cancer,\textsuperscript{54} may remain undetected for decades.\textsuperscript{55} Even when the toxic exposure causes a present injury, additional latent injuries often remain undetected.\textsuperscript{56}

The scientific uncertainty of cancer and other exposure-related diseases\textsuperscript{57} stems from two sources: the complex etiology of the diseases\textsuperscript{58} and the insufficiency of scientific data on toxic exposure and its effect on humans.\textsuperscript{59} Cancer and exposure-related diseases have highly ambiguous etiology,\textsuperscript{60} making it extremely difficult to identify which factor or factors, contributed to a particular disease.\textsuperscript{61} For example, the disease of lung cancer has been attributed to asbestos exposure,\textsuperscript{62} tobacco inhalation,\textsuperscript{63} and ionizing radiation.\textsuperscript{64} Additionally, responsible for the manifestation of a disease and the first signs of the disease by definitive symptoms or actual detection. See Slagel, supra note 8, at 852 n.11 (citing F. HOMBURGER ET AL., A GUIDE TO GENERAL TOXICOLOGY 203 (1983)); Blumenberg, supra note 7, at 668 n.32 (citing Michael Dore, A Commentary on the Use of Epidemiological Evidence in Demonstrating Cause-In-Fact, 7 HARV. ENVTL. L. REV. 429, 429 n.2 (1983)).

\textsuperscript{54} Cancer is the most common injury caused by toxic exposure. Lyndon, supra note 5, at 1801 & n.16 (a high percentage of cancers are thought to be caused by environmental factors) (citing NATIONAL TOXICOLOGY PROGRAM, U.S. DEPT. OF HEALTH & HUMAN SERV., PUBLIC HEALTH SERV., FOURTH ANNUAL REPORT ON CARCINOGENS 5 (1985)). In 1983, 440,000 Americans died of cancer. Id. Scientists estimate that 70 to 90\% of the new 700,000 cases of cancer each year, are caused by toxic exposure. See Kanner, supra note 1, (citing R. WINTER, CANCER-CAUSING AGENTS 1–2 (1979)).

\textsuperscript{55} The average latency periods for toxic substances are as follows: "arsenic, 25 years; tar, 20–24 years; radiation, 20–30 years; asbestos, 18 years; chromates, 15 years." See Slagel, supra note 8, at 859 n.15 (citing 5B LAWYERS MEDICAL CYCLOPEDIA OF PERSONAL INJURIES AND ALLIED SPECIALTIES § 38 (3d ed. 1986)).

\textsuperscript{56} Sometimes toxic exposure results in immediately detectable injuries. Such effects usually "occur shortly after high-level exposure and range in severity from temporary rashes to death." See Jeffrey Trauberman, Statutory Reform of “Toxic Torts”: Relieving Legal, Scientific, and Economic Burdens on the Chemical Victim, 7 HARV. ENVTL. L. REV. 177, 180 (1983).

\textsuperscript{57} "Dermatological injury, gastrointestinal disease, heart disease, respiratory illnesses, and musculoskeletal disorders," are some of the exposure-related diseases. Blumenberg, supra note 7, at 663 n.10 (1992).

\textsuperscript{58} See Developments in the Law, supra note 11, at 1618; Slagel, supra note 8, at 852.

\textsuperscript{59} Slagel, supra note 8, at 852.

\textsuperscript{60} See Developments in the Law, supra note 11, at 1603. Etiology is the study of the causes of diseases. STEIDMAN'S MEDICAL DICTIONARY 542 (25th ed. 1990).

\textsuperscript{61} When an exposure-related injury is discovered it is rarely attributable to a single toxic substance. See Developments in the Law, supra note 11, at 1618 (quoting David Rosenberg, The Causal Connection in Mass Exposure Cases: A “Public Law” Vision of the Tort System, 97 HARV. L. REV. 851, 856 (1984) ("[r]arely is any particular toxic agent the exclusive source of a given disease.")). See also Slagel, supra note 8, at 853; 2 AMERICAN LAW INST., supra note 36, at 327.


\textsuperscript{63} See the required warning on any package of cigarettes.

\textsuperscript{64} See Ayers v. Township of Jackson, 525 A.2d 287, 301 (N.J. 1987).
the causes of many diseases have not yet been determined or have been linked to many contributing factors.

Scientific data concerning cancer and exposure-related diseases is, to date, unavailable or inconclusive. This lack of knowledge stems from several factors. First, medical ethics prohibits the testing of products on humans, therefore minimal pre-production data exists. Second, manufacturers of toxic substances have a disincentive to develop and distribute data. Scientific data collection is extremely expensive, and businesses prefer to spend their funds on new research. Further, if a manufacturer produces data, discovers an increased risk of disease, and distributes that information, the manufacturer loses the cost of the research and the profits from the product. Third, scientific data on cancer and other exposure-related diseases has been unable to "keep pace" with the use of toxic substances. The majority of scientific data on exposure-related diseases cannot be compiled until the manifestation of a disease. This compilation process is hindered by under-reporting of toxic exposure and the limited early identification of vic-

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65 See Foster, supra note 48, at 144. For example, Amyotrophic Lateral Sclerosis (ALS), commonly known as Lou Gehrig's disease, has been diagnosed, but to date, no cause or cure has been scientifically determined. Id.

66 Wendy E. Wagner, Trans-Science in Torts, 96 YALE L.J. 428, 430 n.13 (1986). Cancer, which is linked to toxic-exposure, may also occur in the absence of toxic substances. See Strand, supra note 48, at 584 n.31.

67 See Lyndon, supra note 5, at 1803-04. The National Research Council concluded its report on testing of toxic substances by stating "in view of the great importance of exposure data and indices of hazardous assessment and the nearly complete absence of such data, the committees recommend that planning begin for the development of much more extensive, detailed, and accurate data bases than now exist for exposure assessments." See id. at 1804 (quoting NATIONAL RESEARCH COUNCIL, TOXICITY TESTING: STRATEGIES TO DETERMINE NEEDS AND PRIORITIES 124 (1984)). See also Slagel, supra note 8, at 853-54.

68 Wagner, supra note 66, at 431-32.

69 Lyndon, supra note 5, at 1796; Foster, supra note 48, at 156.

70 The National Research Council states that the cost of a laboratory study of a single chemical is "up to one million dollars." Lyndon, supra note 5, at 1812 & n.64 (citing NATIONAL RESEARCH COUNCIL, TOXICITY TESTING: STRATEGIES TO DETERMINE NEEDS AND PRIORITIES 14, 199-295 (1984)).

71 Lyndon, supra note 5, at 1812-13.

72 Id. at 1796.

73 Id. at 1802.

74 The most accepted method of compiling scientific data, in toxic torts, are epidemiological studies. See Developments in the Law, supra note 11, at 1618 n.84. They compare the incidence of disease in two human groups, those exposed to a toxic substance and those unexposed, and determine the "excess risk" created by the toxic agent. See Shanna H. Swan, Epidemiology in the Courtroom: The Case of Silicone Breast Implants, 451 PLI/LIT 401, PLI Order No. H4-5149 (1992). Therefore, by definition they require an exposed class to facilitate the compilation of scientific data.
tims. Further, toxicity information is not accessible nationwide due to the lack of funding, cooperation, and computer databases. Finally, the significant latency period of cancer destines conclusive scientific data to be several decades behind the manifestation of the disease.

B. Traditional Tort Requirements Create Virtually Insurmountable Barriers to Recovery in Toxic Torts

The unique characteristics of toxic torts—the long latency and scientific uncertainty of the resulting diseases—have caused toxic exposure victims to encounter a number of almost insurmountable legal and practical barriers in recovering for their injuries. The most significant are statutes of limitations, the single cause of action rule, and difficulty in proving causation.

1. Statutes of Limitations Hinder Toxic Tort Recovery

Statutes of limitations require that a cause of action be brought within a designated period of time, as determined by statute. If the maximum time period has elapsed, no legal action may be brought, regardless of whether a valid cause of action existed. Statutes of limitations were designed to limit the period of time within which defendants are subject to liability, while allowing a reasonable period of time for plaintiffs to bring a cause of action. The length of statutes

75 Lyndon, supra note 5, at 1806-07.
76 Id. at 1804.
77 For example, in 1960 a benzene exposure case was dismissed because the causes of leukemia were unknown. See Michael D. Green, The Paradox of Statutes of Limitations in Toxic Substance Litigation, 76 CAL. L. REV. 965, 974 n.35 (1988) (citing Miller v. National Cabinet Co., 68 N.E.2d 811, 813, modified on other grounds, 70 N.E.2d 214 (1960)). Whereas, by the late 1970's benzene was recognized as causing leukemia. See id. at 974. See also Wagner, supra note 66, at 428, 431 (first asbestos plaintiff recovered forty years after science knew asbestos was harmful because scientific data was previously insufficient to prove the cause of action).
78 See Blumenberg, supra note 7, at 667-75; Slagel, supra note 8, at 851-58; Strand, supra note 48, at 575; Rosenberg, supra note 32, at 851-52; Ginsberg & Weiss, supra note 51, at 920-28.
79 See Blumenberg, supra note 7, at 669; Slagel, supra note 8, at 853-55; Strand, supra note 46, at 580-81; Ginsberg & Weiss, supra note 51, at 920.
80 See Blumenberg, supra note 7, at 669; Poston, supra note 9, at 161-68.
81 See Blumenberg, supra note 7, at 671-72; Slagel, supra note 8, at 854-55; Strand, supra note 48, at 583; Rosenberg, supra note 32, at 855-56; Ginsberg & Weiss, supra note 51, at 922.
82 See PROSSER & KEETON, supra note 11, § 30 at 165.
84 CALVIN W. CORMAN, LIMITATION OF ACTIONS § 1.1 at 11-16 (1991).
of limitations vary depending upon the cause of action\textsuperscript{85} and when the statute begins to run—i.e., when the action accrues.\textsuperscript{86}

The traditional view was that statutes of limitations began to run at the time of the defendant's tortious act.\textsuperscript{87} However, in toxic tort cases this standard virtually prohibits recovery\textsuperscript{88} for a number of reasons. First, the statute of limitations often expires before a person is injured.\textsuperscript{89} For example, assume that the defendant improperly disposes of a toxic substance in a landfill; the substance seeps into the groundwater; migrates a few feet per year until it reaches a public water supply; where it is ingested by the plaintiff.\textsuperscript{90} The statute of limitations began to run when the defendant improperly disposed of the toxic substance and may expire before the plaintiff ingests the toxic substance—before the plaintiff was injured. Second, the statute of limitations may expire prior to the time a person discovers they have been injured.\textsuperscript{91} Cancer and other exposure-related injuries have long latency periods which frequently span decades,\textsuperscript{92} and often exceed the relevant statute of limitations.\textsuperscript{93} Lastly, the statute of limitations may expire before the person identifies the cause of the injury and/or the legally responsible party.\textsuperscript{94} Cancer and other exposure-related injuries are scientifically complex and uncertain,\textsuperscript{95} making it extremely difficult and time-consuming to determine causation.\textsuperscript{96}

\textsuperscript{85} Superfund Section 301(e) Study Group, 97th Cong., 2d Sess., Injuries and Damages from Hazardous Wastes Analysis and Improvement of Legal Remedies: Report to Congress in Compliance with Section 301(e) of the CERCLA Act of 1980 (P.L. 96-510) by the "Superfund Section 301(e) Study Group" pt. 1 at 28 (Comm. Print 1982) [hereinafter Superfund Study Group].

\textsuperscript{86} See Superfund Study Group, supra note 85, pt. 1 at 28; Ginsberg & Weiss, supra note 51, at 920-21 & n.259; see also Ayers v. Township of Jackson, 525 A.2d 287, 299 (N.J. 1987).

\textsuperscript{87} See Prosser & Keeton, supra note 11, § 30 at 165; see also Developments in the Law, supra note 11, at 1604-05; Strand, supra note 48, at 580; Superfund Study Group, supra note 85, pt. 2 at 15.

\textsuperscript{88} Superfund Study Group, supra note 85, pt. 1 at 28 & pt. 2 at 15.

\textsuperscript{89} See Prosser and Keeton, supra note 11, § 30 at 165. See also Strand, supra note 48, at 580-81.

\textsuperscript{90} For example, contamination by groundwater, which is one of the primary paths of contamination from landfills, "moves extremely slowly, perhaps only a few tens of feet per year." Strand, supra note 48, at 580-81 & n.21.

\textsuperscript{91} Prosser and Keeton, supra note 11, § 30 at 165; Blumenberg, supra note 7, at 669; see Strand, supra note 48, at 580-81.

\textsuperscript{92} See supra notes 53-56 and accompanying text.

\textsuperscript{93} Strand, supra note 48, at 580-81.

\textsuperscript{94} See id. at 581; Superfund Study Group, supra note 85, pt. 1 at 28.

\textsuperscript{95} See supra notes 57-77 and accompanying text.

\textsuperscript{96} See Strand, supra note 48, at 581.
The application of the traditional view of statutes of limitations virtually prohibits recovery in toxic torts. This result frustrates a purpose of statutes of limitations—the allowance of a reasonable period of time for plaintiffs to bring causes of action.\textsuperscript{97} As a result, the majority of jurisdictions have abandoned the traditional view of statutes of limitations and adopted the "discovery rule."\textsuperscript{98}

The "discovery rule" provides that an action accrues when an injury is discovered or should have reasonably been discovered.\textsuperscript{99} The discovery rule's effectiveness in eradicating the inequity of statutes of limitations in toxic tort cases depends upon the legislative version and/or judicial interpretation of each jurisdiction, a factor which varies significantly.\textsuperscript{100}

In some jurisdictions the discovery rule is strictly construed and the cause of action is held to accrue when the injury is discovered, should reasonably have been discovered, or is capable of ascertainment.\textsuperscript{101} This rule counteracts the effect of the latent nature of exposure-related injuries.\textsuperscript{102} However, it does not eradicate the difficulties caused by the scientific complexity and uncertainty of cancer and other exposure-related diseases.\textsuperscript{103}

Another version of the discovery rule provides that an action accrues when the victim discovers both the injury and its possible

\textsuperscript{97} See Corman, supra note 84, at 14.
\textsuperscript{98} Slagel, supra note 8, at 854; Developments in the Law, supra note 11, at 1605-06; Ayers v. Township of Jackson, 525 A.2d 287, 299 (N.J. 1987). As of 1982, thirty-nine states had adopted a form of the "discovery rule." Superfund Study Group, supra note 85, pt. 1 at 28 & n.4. Alabama, Connecticut, Kansas, Missouri, North Carolina, Ohio, South Carolina, and Vermont have adopted it by statute. Id. Alaska, Arizona, Arkansas, California, Colorado, District of Columbia, Delaware, Florida, Georgia, Hawaii, Illinois, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New Jersey, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Washington, West Virginia, and Wyoming have adopted it by judicial interpretation. Id. New York adopted a version of the discovery rule in 1986. See Green, supra note 77, at 978. For specific statute and case law information, see Superfund Study Group, supra note 85, pt.1 at 28 n.4.
\textsuperscript{99} Black's Law Dictionary, supra note 83, at 322. The "discovery rule" was first utilized in the field of medical malpractice and then borrowed by "dentists, accountants, architects, lawyers, manufacturers of defective products, and a miscellany of negligence and other tort actions." Prosser & Keeton, supra note 11, at § 30 at 167 (footnotes omitted).
\textsuperscript{100} See Strand, supra note 48, at 581 & n.23; Superfund Study Group, supra note 85, pt. 1 at 28-30. See also Ayers, 525 A.2d at 299-300.
\textsuperscript{101} In 1982, this standard was utilized in Arkansas, Connecticut, Delaware, District of Columbia, Georgia, Indiana, Kansas, Maine, Nebraska, North Carolina, and Tennessee. Superfund Study Group, supra note 85, pt. 2 at 16-17. For a more in-depth analysis of each state's "discovery rule," see id. at 19-65. See also Strand, supra note 48, at 581 n.23.
\textsuperscript{102} Developments in the Law, supra note 11, at 1606.
\textsuperscript{103} See Superfund Study Group, supra note 85, pt. 1 at 28.
relationship to a toxic exposure. This version facilitates greater recovery, but frustrates a significant number of toxic tort claims. A person who develops cancer may need significant additional time after discovery of the injury to determine the exact cause of the injury and to identify any or all legally responsible parties.

A final version of the discovery rule provides that the cause of action accrues when the plaintiff knew or should have known about the injury, its cause, and the cause of action. This interpretation potentially provides toxic tort victims the greatest opportunity of recovery. However, it has not been widely adopted.

Toxic tort actions in jurisdictions utilizing the most liberal discovery rules may not be statutorily precluded. However, in all other circumstances, statutes of limitations and weak discovery rules remain a substantial barrier to recovery in toxic tort cases.

2. The Single Controversy Rule Hinders Toxic Tort Recovery

The single controversy rule requires a party to include all past, present, and future claims against an adversary in one cause of action. The failure to do so precludes a party from bringing a subsequent action. The intent of the single controversy rule is to promote judicial economy. However, in toxic tort cases, the rule

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104 In 1982, the states that had adopted this version of the discovery rule were California, Illinois, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, New Hampshire, Oklahoma, Oregon, Vermont, and Washington. Superfund Study Group, supra note 85, pt. 2 at 17. See also Strand, supra note 48, at 581 n.23.
105 Developments in the Law, supra note 11, at 1606. As the New Jersey Supreme Court observed, there is a significant difference between knowing the cause of an injury and knowing that the injury is "attributable to the fault or neglect of another." Lopez v. Swyer, 300 A.2d 563, 567 (N.J. 1973).
106 In 1982, the states that utilized this version of the discovery rule were Arizona, Colorado, Florida, Hawaii, Louisiana, Michigan, Montana, New Jersey, Puerto Rico, South Carolina, Texas, West Virginia, and Wyoming. Superfund Study Group, supra note 85, pt. 2 at 17. Strand, supra note 48, at 581 n.23.
107 This version of the rule has only been adopted by 13 jurisdictions. Superfund Study Group, supra note 85, pt. 2 at 17.
108 Slagel, supra note 82, at 854–55; Developments in the Law, supra note 11, at 1607.
109 The single controversy rule is interchangeable known as the single recovery rule and the single cause of action rule. Blumenberg, supra note 7, at 669 n.37; Poston, supra, note 9, at 161–62.
110 See Blumenberg, supra note 7 at 669; Poston, supra, note 9, at 162. See Ayers v. Township of Jackson, 525 A.2d 257, 300 (N.J. 1987).
111 Ayers, 525 A.2d at 300 (citing Aetna Ins. Co. v. Gilchrist Bros., Inc., 428 A.2d 1254 (1981)); see also Poston, supra, note 9, at 162.
112 See Ayers, 525 A.2d at 300 (quoting Ajamian v. Schlanger, 103 A.2d 9, cert. denied, 348 U.S.
severely hinders recovery. When a toxic tort victim seeks recovery for immediate consequences from exposure, such as property damage or physical injury, the single controversy rule bars that person from any future recovery, such as the manifestation of a latent disease.

Due to the inequitable result of the application of this rule, some jurisdictions have rejected the single controversy rule in toxic tort cases. For example, in *Eagle-Picher Industries v. Cox*, the District Court of Appeals allowed the plaintiff to split the cause of action and subsequently bring a separate suit if the latent disease manifested itself. The court based its decision on equitable grounds, stating "[t]he desirable goal of finality is not an absolute and...the procedural rule against splitting causes of action must be relaxed when equitable considerations demand it." Similar equitable concerns led the Supreme Court of New Jersey, in *Ayers v. Township of Jackson*, to conclude that "the single controversy rule should [not] bar timely causes of action in toxic tort cases 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."

These decisions illustrate the courts’ ability and desire to eradicate inequitable barriers against recovery in toxic tort cases. While this represents some progress, in many jurisdictions the single controversy rule remains a substantial hindrance.

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835 (1954) (the single controversy rule is intended “to avoid the delays and wasteful expense of the multiplicity of litigation which results from splitting a controversy.”); see also Poston, *supra* note 9, at 162.

113 *Ayers*, 525 A.2d at 300; Blumenberg, *supra* note 7, at 669; Poston, *supra* note 9, at 163–64.

114 Blumenberg, *supra* note 7, at 669; Poston, *supra* note 9, at 164–65.

115 See Poston, *supra* note 9, at 168 & n.40.

116 481 So. 2d 517, 521 (Fla. App. 3d Dist. 1985), *review denied*, 492 So. 2d 1331 (Fla. 1986).

117 Id. at 521.

118 525 A.2d 287, 300 (N.J. 1987). See, e.g., Hagerty v. L. & L. Marine Servs., Inc., 788 F.2d 315, 320, *modified on other grounds*, 797 F.2d 256 (5th Cir. 1986) (court stated “[a]t least in the toxic chemical or asbestos cases, the [latent exposure-related disease] should be treated as a separate cause of action for all purposes.”); Jackson v. Johns-Manville Sales Corp., 727 F.2d 506, 520 (5th Cir. 1984), *cert. denied*, 478 U.S. 1022 (1986) (the court allowed the plaintiff to split the cause of action and bring a separate suit if the latent disease manifested itself, stating “logic and justice require that presently latent injuries must await their separate maturity as to a cause of action.”)

3. Causation—The Most Insurmountable Barrier to Recovery

Traditional tort law requires a plaintiff to prove the existence of a "reasonably close causal connection between the conduct [of the defendant] and the [plaintiff's] injury."\textsuperscript{120} This "causation" element must be proven by a preponderance of the evidence.\textsuperscript{121} The courts employ strong and weak versions of the preponderance rule.\textsuperscript{122}

The "strong version" of the preponderance of evidence rule has two components: it requires that the plaintiff show that it is more likely than not that the defendant's actions caused the injury; and "particularistic" proof that the conduct caused the specific harm.\textsuperscript{123} The "weak version" has only one component: it requires the plaintiff to show that it is more likely than not that the defendant's action caused the injury.\textsuperscript{124}

In a traditional tort case, a plaintiff satisfies the causation element by illustrating a cause and effect relationship.\textsuperscript{125} For example, assume that a defendant ran a stop sign, hit the plaintiff's car, and the plaintiff suffered a broken leg. The plaintiff might present the following evidence: testimony that on the day in question the plaintiff was uninjured when he entered his automobile; eyewitness testimony that the defendant ran a stop sign and hit the plaintiff's car; and medical testimony that when the plaintiff arrived at the hospital his leg was broken. This evidence would satisfy both the "weak" and "strong" versions of the preponderance rule.\textsuperscript{126}

In toxic torts cases, by contrast, the long latency and scientific uncertainty of exposure-related diseases prohibit the clear identification of such a cause and effect relationship.\textsuperscript{127} The long latency of

\textsuperscript{120} Prosser & Keeton, supra note 11, § 30 at 164-65.
\textsuperscript{121} To satisfy the preponderance of the evidence standard, one must prove a probability greater than 50%. See Prosser and Keeton, supra note 11, § 38 at 239.
\textsuperscript{122} Rosenberg, supra note 32, at 857-58; Developments in the Law, supra note 11, at 1619.
\textsuperscript{123} Rosenberg, supra note 32, at 857; Developments in the Law, supra note 11, at 1619.
\textsuperscript{124} Rosenberg, supra note 32, at 857-58; Developments in the Law, supra note 11, at 1619.
\textsuperscript{125} Ayers v. Township of Jackson, 525 A.2d 287, 301 (N.J. 1987) (citing Allen v. United States, 588 F. Supp. 247 (D. Utah 1984), rev'd on other grounds, 816 F.2d 1417 (10th Cir. 1987); see Rosenberg, supra note 32, at 857-58; Developments in the Law, supra note 11, at 1619.
\textsuperscript{126} The plaintiff has shown more likely than not that the actions of the defendant cause the injury and "particularized" proof as to the injury.
\textsuperscript{127} See Developments in the Law, supra note 11, at 1618-19; Rosenberg, supra note 32, at 856-57. The long latency and scientific complexity of exposure-related diseases prohibit the presentation of "particularistic" proof, thereby prohibiting toxic tort plaintiff's from satisfying the "strong version" of the preponderance rule. Rosenberg, supra note 32, at 859. See also Foster, supra note 48, at 147; Blumenberg, supra note 7, at 672; Slagel, supra note 8, at 853.
exposure-related diseases creates the opportunity for “intervening causes” to obscure any cause and effect relationship. Further, the ambiguous etiology of cancer makes it virtually impossible to determine which toxic substance or collection of substances caused a particular disease. For example, a plaintiff unknowingly exposed to asbestos in 1962, and diagnosed with lung cancer in 1983, has virtually no way of proving, by a preponderance of the evidence, that the lung cancer was more likely than not caused by the asbestos exposure, and not by tobacco inhalation or any number of other environmental factors.

Since toxic tort plaintiffs cannot establish the traditional cause and effect relationship, they must prove causation by establishing a causal nexus between the disease and the hazardous substance. This is accomplished by utilizing scientific data and expert testimony. The most accepted scientific data is the epidemiological study, which

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128 Ayers, 525 A.2d at 302 (quoting Allen v. United States, 588 F. Supp. 247, 405-06 (D. Utah 1984), rev'd on other grounds, 816 F.2d 1417 (10th Cir. 1987)) (“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.”) For a more extensive discussion of the latency of toxic torts, see supra notes 53-56 and accompanying text.

129 See Slagel, supra note 8, at 854. When an exposure-related injury is discovered it is “rarely attributable to a single toxic agent.” Developments in the Law, supra note 11, at 1617; Rosenberg, supra note 32, at 856 (“rarely is any particular toxic agent the exclusive source of a given disease.”). For a more extensive discussion of the scientific complexity of toxic torts, see supra notes 57-77 and accompanying text.

130 The latency period for asbestos-related disease is twenty years or more. See Kirkland, supra note 62, at 377.

131 Asbestos exposure “has been linked with asbestosis (a debilitating lung disease) and mesothelioma (a rare cancer of the chest and abdominal lining), as well as with cancers of the lung, esophagus, stomach, colon, and other organs.” See id. at 376.

132 The EPA estimates 733,000 public and commercial buildings contain asbestos. See id. at 375 (citing 40 C.F.R. § 61.141 (1988)).

133 Developments in the Law, supra note 11, at 1618. Instead of proving that A caused B, the toxic tort plaintiff attempts to show that A creates a greater risk that B will occur. See id. at 1619. The preponderance rule, even the application of the “weak version,” requires that plaintiffs establish that A creates a great than 50% risk that B will occur. Id.

134 Blumenberg, supra note 7, at 673. A number of studies are used by scientists to determine causal relationships. These include: the epidemiological study, which compares patterns of disease in exposed and unexposed humans; the cluster analysis, which reviews clusters of diseases and searches for common toxic exposure; short-term molecular assays, which “take advantage of the similarities between the metabolic processes of humans and other forms of life to develop experiments that are relatively inexpensive and quick to complete;” and animal bioassays, where “scientists give several hundred mammals prescribed doses of a particular toxic substance and then identify causes of death in the animal cohort.” Id. at 673 & n.52 (quoting 2 AMERICAN LAW INST., ENTERPRISE RESPONSIBILITY FOR PERSONAL INJURY 321-24 (1991)).

135 The epidemiological study is considered the best, if not the only, proof of causation in toxic tort cases. See Developments in the Law, supra note 11, at 1231 (describing epidemiological
analyzes patterns of disease in the human population. An epidemiologist compares the incidence of disease in two groups: those exposed, and those not exposed, to a toxic substance, in order to determine the “excess risk” created by the substance.

Traditionally, courts were reluctant to rely upon statistical evidence, such as epidemiological studies, to determine causation. Some courts, realizing the crucial importance of scientific data in toxic tort cases, have accepted such evidence as proof of causation. And in those cases, if the scientific data indicates a more likely than not chance that the toxic substance caused the injury, the toxic tort plaintiff can recover. However, this result rarely occurs. In most cases, statistical evidence cannot satisfy even the “weaker” version of the preponderance rule. Therefore, the causation element remains a virtually insurmountable barrier to recovery in toxic tort cases.

4. Practical Factors that Hinder Toxic Tort Recovery

In addition to the aforementioned problems, a host of practical factors severely hinder recovery in toxic tort cases. First, the identification of the legally responsible party is often difficult, if not impossible. This is due to the generic character of the toxic products.

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136 Blumenberg, supra note 7, at 673 & n.52; Swan, supra note 74.
137 See Swan, supra note 74; Foster, supra note 48, at 151.
140 See Developments in the Law, supra note 11, at 1618–19. The scientific data must show that the “excess risk” of the exposure exceeds the background risk of contracting the disease. Rosenberg, supra note 32, at 858.
141 See Developments in the Law, supra note 11, at 1619. Rosenberg, supra note 32, at 858.
142 See Developments in the Law, supra note 11, at 1619; Rosenberg, supra note 32, at 858. For a discussion of why statistical evidence is uncertain and inconclusive, see supra notes 67–77 and accompanying text.
143 Blumenberg, supra note 7, at 673–74; Slagel, supra note 8, at 853; Strand, supra note 48, at 584–85. Long latency periods and the mysteries of disease etiology necessitate exclusive reliance on statistical evidence, therefore, the strong version of the preponderance rule requires the dismissal of all mass exposure claims and the weak version results in the dismissal of most cases. Rosenberg, supra note 32, at 858.
144 Blumenberg, supra note 7, at 674–75; Slagel, supra note 8, at 853; Strand, supra note 48, at 584–85; Ginsberg & Weiss, supra note 51, at 925.
145 Rosenberg, supra note 32, at 856. Similar, even identical, toxic substances are often produced by multiple manufacturers, making it virtually impossible to identify exactly who produced the substance. For example, diethylstilbestrol (DES) was produced by over 200 compa-
the inconspicuousness of the exposure event,\textsuperscript{146} and the long latency period of exposure-related diseases.\textsuperscript{147} Second, the prevalence of “covert, illicit” dumping complicates the process of identifying the legally responsible party.\textsuperscript{148} An EPA study indicated that a significant number of the 1,200 to 2,000 imminently dangerous hazardous waste sites in the United States are “abandoned” and that the owner has not, nor will not, be identified.\textsuperscript{149} Third, even if the responsible party is identifiable, that party may escape liability.\textsuperscript{150} This occurs when the responsible party, such as a corporation, is no longer in business\textsuperscript{151} or is financially unable to satisfy its debts.\textsuperscript{152} Fourth, toxic tort litigation is very expensive and many plaintiffs are unable to bear the financial burden of protracted litigation.\textsuperscript{153} In order to prove causation,\textsuperscript{154} a plaintiff must gather extensive scientific evidence and employ numerous experts, each of which is an enormously costly endeavor.\textsuperscript{155} This barrier is exacerbated by the fact that many of those persons exposed to hazardous substances are economically disadvantaged.\textsuperscript{156} Lastly,
due to the barriers discussed above, many toxic tort plaintiffs are strongly encouraged to settle prematurely\textsuperscript{157} or forego the cause of action entirely.\textsuperscript{158}

5. The Purposes of Tort Law are Frustrated by Toxic Torts

Tort law is designed to compensate victims of wrongful conduct and to deter similar tortious conduct in the future.\textsuperscript{159} In the field of toxic torts, these purposes are frustrated.\textsuperscript{160} The legal barriers of statutes of limitations,\textsuperscript{161} the single controversy rule,\textsuperscript{162} and proof of causation,\textsuperscript{163} in addition to numerous practical barriers,\textsuperscript{164} virtually ensure that many toxic tort plaintiffs are not fully compensated for their injuries.\textsuperscript{165} This uncertainty of recovery discourages legitimate legal actions from being pursued\textsuperscript{166} and encourages premature settlements.\textsuperscript{167}

The deterrence function of tort law is also severely frustrated in toxic tort cases.\textsuperscript{168} Because manufacturers, distributors, and disposers of toxic substances are rarely held fully liable for their wrongful actions, they have no economic incentive to adopt measures which will

\footnotesize{(citing Home Street, USA: Living With Pollution, GREENPEACE, Oct./Nov./Dec. 1991, at 8, 10). Further, on Chicago's southeast side, an economically disadvantaged area, 150,000 residents "live with 50 active or closed commercial hazardous waste landfills, 100 factories (including 7 chemical plants and 5 steel mills), and 102 abandoned toxic waste dumps." Id. 157 Blumenberg, \textit{supra} note 7, at 671; Strand, \textit{supra} note 48, at 586. Bargaining inequities between plaintiffs and defendants, especially corporate defendants, exist in most cases, but are more pronounced in toxic tort cases due to the "uncertainty of eventual recovery." Strand, \textit{supra} note 48, at 586.

158 Blumenberg, \textit{supra} note 7, at 671; Strand, \textit{supra} note 48, at 586.

159 In essence, tort law attempts to balance the rights of the individual, to receive compensation, and the rights of society, to have future deleterious activity deterred. See \textsc{Prosser & Keeton}, \textit{supra} note 11, § 1 at 6 & § 4 at 25-26.

160 Slagel, \textit{supra} note 8, at 856-57; \textit{Developments in the Law}, \textit{supra} note 11, at 1630.

161 For a comprehensive discussion of the legal barriers to recovery, created by the statutes of limitations, see \textit{supra} notes 82-108 and accompanying text.

162 For a comprehensive discussion of the legal barriers to recovery, created by the single controversy rule, see \textit{supra} notes 109-19 and accompanying text.

163 For a comprehensive discussion of the legal barriers to recovery, created by the causation requirements, see \textit{supra} notes 120-43 and accompanying text.

164 For a comprehensive discussion of the practical barriers to recovery in toxic tort cases, see \textit{supra} notes 144-58 and accompanying text.

165 See Blumenberg, \textit{supra} note 7, at 682; Rosenberg, \textit{supra} note 32, at 855-59; Strand, \textit{supra} note 48, at 581-88; \textit{Developments in the Law}, \textit{supra} note 11, at 1602-12, 1616-22; Ginsberg & Weiss, \textit{supra} note 51, at 920-28.

166 Slagel, \textit{supra} note 8, at 856.

167 Id.; Strand, \textit{supra} note 48, at 579.

168 Slagel, \textit{supra} note 8, at 856; \textit{Developments in the Law}, \textit{supra} note 11, at 1630.)
prevent or minimize future harm.\footnote{169} Further, the reoccurrence of cancer and other exposure-related diseases cannot be averted because scientific data, concerning the effect of toxic chemicals on people, is often unavailable, inconclusive, or both.\footnote{170}

III. DEVELOPMENT OF NON-TRADITIONAL TORT REMEDIES TO ACCOMMODATE THE UNIQUE NATURE OF TOXIC TORTS

A. Tort Law As The Means for Change

Common law is a “body of law that develops and derives through judicial decisions.”\footnote{171} Tort law is overwhelmingly common law.\footnote{172} As such, tort law is constantly developing and adapting, in response to changing societal circumstances.\footnote{173} Tort law adaptation typically occurs incrementally, on a case-by-case basis.\footnote{174} Occasionally, more dramatic changes occur when a court recognizes a novel claim,\footnote{175} decides a case of first impression,\footnote{176} or overrules an existing precedent.\footnote{177}

The widespread use of toxic substances, the proliferation of exposure to those substances, the unique nature of the resulting injuries, and the inapplicability of existing tort law, initially triggered incremental adaptations of traditional tort doctrine.\footnote{178} For example, courts adopted the “discovery rule,” thereby extending the statute of limitations;\footnote{179} rejected the “single controversy rule,” allowing for multiple

\footnote{169} Slagel, supra note 8, at 856–57. “Mass exposure torts are frequently products of the deliberate policies of businesses that tailor safety investments to profit margins. Such risk-taking policies should be especially amenable to control through threats of liability.” Rosenberg, infra note 32, at 855.
\footnote{170} Scientific uncertainty results in the continued use of potentially hazardous substances. See Gara, supra note 3, at 265–66; Wagner, supra note 66, at 430.
\footnote{171} See BLACK'S LAW DICTIONARY, supra note 83, at 189.
\footnote{172} See PROSSER & KEETON, supra note 11, § 3 at 19.
\footnote{173} See id.; Slagel, supra note 8, at 850; Developments in the Law, supra note 11, at 1602. Tort law has and will continue to change in response to changing societal circumstances. PROSSER & KEETON, supra note 11, § 3 at 19.
\footnote{174} See PROSSER & KEETON, supra note 11, at § 3 at 18–19.
\footnote{175} Id. § 3 at 18. “[T]he mere fact that a claim is novel does not defeat it.” Id. For example, in this century “courts have first recognized an action for prenatal injuries, an action for wrongful birth, a recovery by a wife for personal injury at the hands of her husband, new tort liabilities of municipal corporations, and a whole new field of actions for nervous shock and mental suffering.” Id. § 3 at 19 (footnotes omitted).
\footnote{176} Id. § 3 at 18–19. When a court decides an issue of first impression, it must balance the interests of the plaintiff, the defendant, and the general public. Id. § 3 at 17.
\footnote{177} Id. § 3 at 18–19. “Devotion to precedent is one thing; distrust of new ideas, quite another.” Id. § 3 at 19.
\footnote{178} See infra notes 179–82 and accompanying text.
\footnote{179} See supra notes 97–107 and accompanying text.
causes of action; \(^{180}\) developed a “weak version” of the preponderance rule, to ease the burden of causation; \(^{181}\) and, accepted statistical data as proof of causation, because it provides the best, if not the only, available evidence. \(^{182}\) These incremental changes have proven insufficient to eradicate the inequities suffered by toxic torts victims. \(^{183}\)

As a result, numerous innovative damage theories were developed and to varying degrees, recognized by the courts. \(^{184}\) These include claims for fear of future illness, \(^{185}\) enhanced risk of future disease, \(^{186}\) medical monitoring damages, \(^{187}\) and public health funds. \(^{188}\)

\(\text{\cite{supra notes 115–18 and accompanying text.}}\)

\(\text{\cite{supra notes 123–24 and accompanying text.}}\)

\(\text{\cite{supra notes 138–39 and accompanying text.}}\)

\(\text{\cite{Blumenberg, supra note 7, at 667–75; Slagel, supra note 8, at 851–58; Rosenberg, supra note 32, at 855–59; Ginsberg & Weiss, supra note 51, at 920–28. Some commentators state that common law doctrines and the courts are incapable of accommodating toxic torts. Slagel, supra note 8, at 857; Developments in the Law, supra note 11, at 1630–31; Trauberman, supra note 56, at 188–202; Superfund Study Group, supra note 85, pt. 1 at 130–32.}}\)

\(\text{\cite{The validity of these views need not be addressed, because legislative action has done little to provide recovery to victims of toxic exposure. See Blumenberg, supra note 7, at 675–76; Slagel, supra note 8, at 857.}}\)

\(\text{\cite{In 1980, the Comprehensive Environmental Response, Compensation, and Liability Act [hereinafter CERCLA] was enacted. 42 U.S.C. §§ 9601–9675 (1988 & Supp. III 1991). Noticeably absent from CERCLA were any provisions granting private parties the right to recover for personal injury. Daigle v. Shell Oil Co., 972 F.2d 1527, 1535–36 (10th Cir. 1992); Ambrogi v. Gould, 750 F. Supp. 1233, 1239 (M.D. Pa. 1990); Dan A. Tanenbaum, When Does Going to the Doctor Serve the Public Health? Medical Monitoring Response Costs under CERCLA, 59 U. CHI. L. REV. 925, 926 (1992). Only one CERCLA provision has been interpreted potentially to provide such recovery. See Ambrogi, 750 F. Supp. at 1239; Tanenbaum, supra note 183, at 926. Section 9607(a)(4)(B) states, in pertinent part, “that certain responsible parties may be sued for: a) all costs of removal or remedial action incurred ... and b) any other necessary costs of response incurred by any other person.”}}\)

\(\text{\cite{While courts initially interpreted the language of section 9607(a)(4)(B) to provide some recovery to private parties, the current trend is to narrowly interpret this provision and to deny private party recovery for injury. See, e.g., Daigle, 972 F.2d at 1532–37 (court stated that under CERCLA the “necessary costs of response” were those necessary to containment and cleanup of hazardous releases and held that plaintiffs were not entitled to recover medical monitoring damages); Bolin v. Cessna Aircraft Co., 759 F. Supp. 692, 714 (D. Kan. 1991) (court held that medical testing and health assessment costs cannot be recovered under CERCLA); Ambrogi, 750 F. Supp. at 1244 (court held that medical monitoring damages are not “necessary costs of response” under CERCLA).}}\)

\(\text{\cite{The most common damage theories are fear of future illness, enhanced risk of future disease, and medical monitoring damages. Slagel, supra note 8, at 858–59; Dore, supra note 12, § 7.01 at 7–2; Rudlin & Stravitz, supra note 12; Lovell et al., supra note 44. Less commonly asserted theories are impaired quality-of-life and loss-of-chance. Slagel, supra note 8, at 858–59.}}\)

\(\text{\cite{See infra notes 189–205 and accompanying text.}}\)

\(\text{\cite{See infra notes 206–27 and accompanying text.}}\)

\(\text{\cite{See infra notes 232–316 and accompanying text.}}\)

\(\text{\cite{See infra notes 317–76 and accompanying text.}}\)
B. Early Theories of Non-Traditional Tort Recoveries

The claim of "fear of future illness"\(^\text{189}\) is a claim for a present injury, such as emotional distress or apprehension, due to the potential for future injury, such as cancer or other exposure-related diseases.\(^\text{190}\) Traditionally, without a presently discernible injury,\(^\text{191}\) tort law prohibited recovery of such claims.\(^\text{192}\) However, in response to the inadequacies of traditional tort law in toxic tort cases, some courts have modified this standard and recognized a cause of action for fear of future illness.\(^\text{193}\)

Most jurisdictions recognizing a fear of future illness cause of action require that the plaintiff's fear of contracting a future illness be genuine and "reasonable."\(^\text{194}\) For example, in Potter v. Firestone Tire and Rubber Co., the California Court of Appeals held that the plaintiff's fear of contracting cancer from ingesting water contaminated with benzene and vinyl chloride, both known human carcinogens,\(^\text{195}\) was genuine and "reasonable."\(^\text{196}\)

Jurisdictions vary significantly as to the degree of physical manifestation required for recovery.\(^\text{197}\) Some courts allow recovery absent any physical injury.\(^\text{198}\) For example, in Hagerty v. L & L Marine Services, Inc., the United States Court of Appeals for the Fifth Cir-

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\(^{189}\) The claim, fear of future illness, is also referred to as "cancerphobia." Arvin Maskin & Peter A. Antonucci, Overview and Update of Emerging Damage Theories in Toxic Tort Litigation, CS7 ALI-ABA 629, 650 (1993).

\(^{190}\) Maskin & Antonucci, supra note 189, at 650. See also Slagel, supra note 8, at 866; Rudlin & Stravitz, supra note 12, at 73; Lovell et al., supra note 44; Dore, supra note 12, § 7.09 at 7-10-7-11.

\(^{191}\) The requirement is that there must be a physical injury from the impact or from the emotional distress. See Prosser and Keeton, supra note 11, § 54 at 363.

\(^{192}\) Prosser & Keeton, supra note 11, § 54 at 363; see also Slagel, supra note 8, at 859; Restatement (Second) of Torts § 436A (1965). The courts considered claims for emotional distress to be highly speculative and difficult to assess genuineness. Maskin & Antonucci, supra note 189, at 650.

\(^{193}\) See Slagel, supra note 8, at 859-60.

\(^{194}\) Maskin & Antonucci, supra note 189, at 650, 663; Rudlin & Stravitz, supra note 12.


\(^{196}\) Potter, 274 Cal. Rptr. at 897. See also Hagerty v. L & L Marine Servs., Inc., 788 F.2d 315, 317, 318-19, modified on other grounds, 797 F.2d 256 (5th Cir. 1986) (court held that plaintiff doused in dripalene, a known carcinogen, who studied about the chemical and quit job to avoid further exposure was genuine and his fear was reasonable).

\(^{197}\) Jurisdictions range from allowing recovery without any physical injury to requiring manifestation of an injury and are split as to whether slight injuries, ingestions, exposures, or subcellular changes are sufficient for recovery. See Maskin & Antonucci, supra note 189, at 650-63. For a comprehensive discussion of injury requirements in toxic tort cases, see id. at 650-73.

\(^{198}\) See Maskin & Antonucci, supra note 189, at 650, 663; Rudlin & Stravitz, supra note 12; Lovell et al., supra note 44.
cuit held that the plaintiff, who was doused in dripoline, a known human carcinogen, was entitled to recover damages for fear of future illness, with or without a physical injury.\textsuperscript{199} Other courts have held that any physical symptom, no matter how trivial or small, satisfies the physical injury requirement.\textsuperscript{200} For example, in Villari \textit{v. Terminix International, Inc.}, the District Court for the Eastern District of Pennsylvania held that the physical injury requirement was satisfied by the plaintiff’s suffering from headaches, nausea, and dizziness.\textsuperscript{201} And still other courts have held that the ingestion of a toxic substance satisfies the physical injury requirement.\textsuperscript{202} For example, in \textit{Herber v. Johns-Manville Corp.}, the United States Court of Appeals for the Third Circuit held that the infiltration of asbestos fibers into the plaintiff’s lungs and the resulting pleural thickening, while a slight impact and injury, were sufficient to satisfy the physical injury requirement.\textsuperscript{203} The majority of jurisdictions however, require the manifestation of a physical injury as a prerequisite to recovery.\textsuperscript{204} The majority view is illustrated by the decision of the United States Court of Appeals for the Fourth Circuit in \textit{Ball v. Joy Technologies, Inc.}, which held that a physical injury was required to recover a fear of future illness claim, and mere exposure does not constitute such an injury.\textsuperscript{205}

Another innovative damage theory recognized by the courts is the enhanced risk of future illness claim.\textsuperscript{206} An enhanced risk of future illness claim provides recovery in a present action, for a significant

\textsuperscript{199} 788 F.2d at 317–19; see also Potter, 274 Cal. Rptr. at 888, 891 (court held that plaintiff, who ingested toxic water, need not have a physical injury to bring a fear of future illness claim).

\textsuperscript{200} Lovell et al., supra note 44; see Maskin & Antonucci, supra note 189, at 656–57.

\textsuperscript{201} 677 F. Supp. 330, 337–38 (E.D. Pa. 1987); see also Friedman v. F.E. Myers Co., 706 F. Supp. 376, 380–81 (E.D. Pa. 1989) (district court held that disorientation and dizziness were sufficient physical injuries, to survive defendant’s motion for summary judgement); Anderson v. W.R. Grace & Co., 628 F. Supp. 1219, 1226 (D. Mass. 1986) (court held that plaintiffs’ alleged physical symptoms, harm to their bodies ability to fight disease and to their body’s organs was sufficient to maintain their claims for emotional distress damages).

\textsuperscript{202} See Maskin & Antonucci, supra note 189, at 657; Lovell et al., supra note 44. For an extensive discussion of courts holding that ingestion of toxic substance constitutes physical injury, see Maskin & Antonucci, supra note 189, at 657–60.

\textsuperscript{203} 785 F.2d 79, 85 (3d Cir. 1986); see also Eagle-Picher Indus., Inc. v. Cox, 481 So. 2d 517, 527 (Fla. App. 3d Dist. 1985), review denied, 492 So. 2d 1331 (Fla. 1986) (court held that the inhalation of asbestos fibers into lungs satisfied the impact rule, therefore no physical manifestation of injury was necessary).

\textsuperscript{204} See PROSSER & KEETON, supra note 11, § 54 at 362–63; see also DORE, supra note 12, § 7.03 at 7–11; Slagel, supra note 8, at 860; Rudlin & Stravitz, supra note 12.

\textsuperscript{205} 958 F.2d 36, 38 (4th Cir.), cert. denied, 112 S. Ct. 876 (1992); see also Friedman v. F.E. Myers & Co., 706 F. Supp. 376, 381 (E.D. Pa. 1989) (district court granted summary judgement against plaintiffs exposed to contaminated water because there was no manifestation of physical injury).

\textsuperscript{206} See Maskin & Antonucci, supra note 189, at 629; Slagel, supra note 8, at 859–60.
risk of future disease. This cause of action differs from fear of future illness damages because the plaintiff does not claim a present injury but seeks to recover for a potential future injury. Traditional tort doctrine prohibited such causes of action by requiring an actual injury as a prerequisite to recovery. However, in response to the long latency of exposure-related diseases and the barriers to recovery created by statutes of limitations, some courts modified the traditional standard and recognized this novel claim.

The jurisdictions that recognize the enhanced risk of future illness cause of action require the plaintiff to prove, through statistical data, that the future illness will develop. The degree of statistical certainty required varies by jurisdiction. The majority of jurisdictions employ the "reasonable medical certainty" standard. This standard requires that the plaintiff prove it is "more likely than not" that they will suffer from the future illness. For example, in 

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207 Lovell et al., supra note 44.
208 See Slagel, supra note 8, at 859-60.
209 PROSSER & KEETON, supra note 11, § 2 at 6. See also Slagel, supra note 8, at 859 (quoting Brafford v. Susquehanna Corp., 586 F. Supp. 14, 17 (D. Colo. 1984) ("This requirement is premised in the principle of tort law that the plaintiff must establish an injury that is not speculation to recover damages.").
211 See Maskin & Antonucci, supra note 189, at 641-42; Slagel, supra note 8, at 858.
212 See Slagel, supra note 8, at 860; Maskin & Antonucci, supra note 189, at 635. For an extensive discussion of existing caselaw, see Maskin & Antonucci, supra note 189, at 635-40.
213 Essentially two standards are applied; "reasonable medical certainty" and "reasonable probability." See infra notes 214-27 and accompanying text.
214 Carson, supra note 210, at 637-38; Maskin & Antonucci, supra note 189, at 635-40 (describing decisions holding that plaintiffs must satisfy the "reasonable medical certainty" standard); see DORE, supra note 12, § 7.07[1] at 7-16.2; Slagel, supra note 8, at 860; Lovell et al., supra note 44.
215 In other words the plaintiff must show a greater than 50% likelihood that they will contract the future illness. Maskin & Antonucci, supra note 189, at 635. See also Ayers v. Township of Jackson, 525 A.2d 287, 306 (N.J. 1987).
216 Some victims of toxic exposure do recover under this standard. See, e.g., Jackson v. Johns-Manville Sales Corp., 781 F.2d 394, 412-13 (5th Cir. 1986), cert. denied, 487 U.S. 922 (1986) (allowing recovery for increased risk of illness where evidence indicated that plaintiff, exposed to asbestos, had a greater than 50% chance of contracting cancer); Gideon v. Johns-Manville Sales Corp., 761 F.2d 1129, 1138 (5th Cir. 1985) (court allowed for recovery when proof indicated by a reasonable medical certainty that illness would develop. For a discussion of the difficulties toxic tort plaintiff encounter proving causation, see Maskin & Antonucci, supra note 189, at 635; Slagel, supra note 8, at 859. See supra notes 120-43 and accompanying text.
could not prove that it was "more likely than not" that cancer would result from the asbestos exposure.\textsuperscript{217} The court stated that without such proof the claim was "merely speculative."\textsuperscript{218} The court's rationale, shared by the majority, was that public policy considerations prohibit granting recovery for a "speculative" disease, which might never develop.\textsuperscript{219}

While most jurisdictions require "reasonable medical certainty," some adhere to the more lenient "reasonable probability" standard. This standard, while statistically undefined, requires a lower standard of proof than the traditional "more likely than not" standard and provides the best opportunity for recovery for toxic tort plaintiffs.\textsuperscript{220} For example, in Valori v. Johns-Manville Sales Corp.,\textsuperscript{221} the District Court for the District of New Jersey held that statistical evidence, indicating that the plaintiff had a forty-three percent risk of contracting a disease, satisfied the "reasonable probability" standard.\textsuperscript{222} The court reasoned that the "more likely than not" standard was too burdensome in toxic tort cases and therefore a more flexible standard should apply.\textsuperscript{223}

One significant limitation of the "reasonable probability" standard is that recovery is often precluded due to the scientific uncertainty of cancer and other exposure-related diseases.\textsuperscript{224} For example, in Ayers v. Township of Jackson, the plaintiffs, who were exposed to and

\textsuperscript{217} 561 A.2d 257, 258, 262 (N.J. 1989). See, e.g., Hagerty v. L. L. Marine Servs., 788 F.2d 315, 319 (5th Cir.), modified on other grounds, 797 F.2d 256 (5th Cir. 1986) (court stated "a plaintiff can recover [damages for enhanced risk] only where he can show that the toxic exposure more probably than not will lead to cancer").

\textsuperscript{218} 561 A.2d at 262. See, e.g., Hagerty, 788 F.2d at 319 (court stated plaintiff must show that toxic exposure will more probably than not will lead to cancer to recover for enhanced risk of illness); Anderson v. W.R. Grace & Co., 628 F. Supp. 1219, 1231 (D. Mass. 1986) (court held that "when an injured person seeks to recover for harms that may result in the future, recovery depends upon establishing a reasonable probability that the harm will occur").

\textsuperscript{219} See supra note 12, § 7.07[1] at 7–16.2–7–16.6. See, e.g., Ayers, 525 A.2d at 307 ("a cause of action for unquantified enhanced risk claims exposes the tort system, and the public it serves, to the task of litigating vast numbers of claims for compensation based on threats of injuries that may never occur").

\textsuperscript{220} See supra note 12, § 7.07[1] at 7–16.6; Maskin & Antonucci, supra note 189, at 641. For an extensive examination of cases applying the "reasonable probability" standard, see Maskin & Antonucci, supra note 189, at 641.

\textsuperscript{221} No. 82-2686 1985 WL 6074 (D.N.J. Dec. 11, 1985).


\textsuperscript{223} See Valori, 1985 WL 6074, at *3, (court stated that threshold of more likely than not is too burdensome for plaintiffs given the modest purpose of the "reasonable probability" standard).

\textsuperscript{224} For a discussion of proof of causation barriers stemming from scientific uncertainty of cancer and other exposure-related disease, see supra notes 127–32 and accompanying text.
ingested toxic chemicals, were denied recovery because there was no quantification of their risk of contracting an exposure-related disease.\textsuperscript{225} The Supreme Court of New Jersey held that without quantification of the risk, the "reasonable probability" standard was not satisfied.\textsuperscript{226} The court further reasoned that the speculative nature of an unquantified enhanced risk cause of action, the difficulties inherent in adjudicating such claims, and the principles of tort law, argue against the recognition of this cause of action.\textsuperscript{227}

In spite of the foregoing limitations, early theories of non-traditional tort remedies have provided toxic tort plaintiffs with some measure of relief.\textsuperscript{228} However, as long as the majority of jurisdictions require the manifestation of a physical injury\textsuperscript{229} and adhere to the "reasonable medical certainty" standard\textsuperscript{230} as prerequisites to recovery, these adaptations will be insufficient to equitably compensate victims of toxic exposure.\textsuperscript{231}

\textbf{C. Medical Monitoring Damages}

Medical monitoring damages are the most widely-accepted, innovative theory recognized by the courts in the field of toxic torts.\textsuperscript{232} A claim for medical monitoring damages\textsuperscript{233} is a claim for the post-exposure, pre-symptom compensation of future periodic medical examinations, designed to facilitate early detection and diagnosis of exposure-related diseases.\textsuperscript{234} This cause of action emanates from traditional tort

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\textsuperscript{225} See 525 A.2d 287, 308 (N.J. 1987). \textit{See also} Anderson v. W.R. Grace & Co., 628 F. Supp. 1219, 1230–32 (D. Mass. 1986) (district court held that plaintiff, who ingested toxic chemicals, could not recover under enhanced risk of illness cause of action because there was no quantification of the increased risk, and therefore the "reasonable probability" standard was not satisfied). \textsuperscript{226} See Ayers, 525 A.2d at 308. \textsuperscript{227} \textit{Id.} at 307–08. Specifically, the court stated that recognition of such a cause of action would generate substantial litigation, provide excess burden on judges attempting to assess damages without clear guidelines, and escalate insurance rates. \textit{Id.} at 307. \textsuperscript{228} Slagel, \textit{supra} note 8, at 859. For additional examples, see \textit{supra} notes 194–203, 220–23 and accompanying text. \textsuperscript{229} Slagel, \textit{supra} note 8, at 860. For additional examples, see \textit{supra} notes 214–19 and accompanying text. \textsuperscript{230} Slagel, \textit{supra} note 8, at 860; Carson, \textit{supra} note 210, at 638. \textsuperscript{231} As long as the majority of jurisdictions require the manifestation of an injury, prior to recovery for fear of future illness, a significant number of plaintiffs will be unable to recover. See Slagel, \textit{supra} note 8, at 860. \textsuperscript{232} \textit{Id.} at 858–59; Rudlin & Stravitz, \textit{supra} note 12. One commentator described medical monitoring damages as one of the "most radical revolutions" in tort law. See Rudlin & Stravitz, \textit{supra} note 12. \textsuperscript{233} Courts and commentators use the terms medical monitoring and medical surveillance interchangeably. \textit{See}, e.g., Blumenberg, \textit{supra} note 7, at 678. \textsuperscript{234} See \textit{id.} at 668; Rudlin & Stravitz, \textit{supra} note 12; Allan Kanner, \textit{Medical Monitoring: State
doctrines, accepted medical principles, and public policy considerations.

1. Legal Foundations of Medical Monitoring Damages

Medical monitoring damages originated from two traditional tort doctrines, the "avoidable consequences" rule and the "allowance of medical expense damages" rule. The traditional tort doctrine, the avoidable consequences rule, denies a plaintiff recovery for an injury, that could have been avoided by "reasonable conduct." For example, assume that the defendant runs a stop sign, hits the plaintiff's car, and the plaintiff suffers a broken leg. The plaintiff does not seek medical treatment, the leg heals badly, and the plaintiff is permanently crippled. Under the avoidable consequences rule, the plaintiff can recover damages for the original broken leg, but cannot recover additional damages for the severity of the injury. This is because the severity of the injury could have been avoided through the exercise of "reasonable conduct."

By analogy, in the field of toxic torts, the avoidable consequences rule requires that the victims of toxic exposure undergo "medically advisable" treatment or forfeit their right to recovery. The medical and legal communities deem periodic medical examinations, which facilitate the early detection of cancer and other serious exposure-related diseases, as "medically advisable" treatment. As a result, the


See Ayers, 525 A.2d at 308-11; Slagel, supra note 8, at 863-66. See infra notes 238-56 and accompanying text.

See Ayers, 525 A.2d at 311; Slagel, supra note 8, at 867-69. See infra notes 257-59 and accompanying text.

See Ayers, 525 A.2d at 308-12 (Supreme Court of New Jersey reasoned that medical monitoring damages were consistent with legal, medical, and public policy principles). See also Slagel, supra note 8, at 869-70. See infra notes 260-66 and accompanying text.

Blumenberg, supra note 7, at 678; Slagel, supra note 8, at 868; see, e.g., Hagerty v. L. & L. Marine Servs., Inc., 788 F.2d 315, 319 (5th Cir.), modified on other grounds, 797 F.2d 256 (5th Cir. 1986).

Blumenberg, supra note 7, at 678-79 (citing CHARLES T. MCCORMICK, HANDBOOK ON THE LAW OF DAMAGES § 90 (1935)). See also Slagel, supra note 8, at 865.

See Evers v. Dollinger, 471 A.2d 405, 419-20 (N.J. 1983) (court discusses that it is universally agreed within the medical community that delay in diagnosis and treatment of cancer increases risk of metastasis and that this information is widely disseminated and accepted
avoidable consequences rule dictates that victims of toxic exposure must undergo periodic medical examinations or forfeit all, or part, of their right to recovery. Requiring victims of toxic torts to pay for these medical examinations to preserve the right to recovery, is inequitable and subverts the very purposes of tort law. Therefore, the avoidable consequences rule supports the recognition of medical monitoring damages in the field of toxic torts.

The “allowance of medical expense damages” rule, under traditional tort law, provides that the plaintiff who suffers an injury is entitled to recover past and future medical expenses, incurred as a result of the injury. For example, assume that the defendant runs a stop sign, hits the plaintiff’s car, and the plaintiff suffers a broken leg. While at the hospital, the plaintiff undergoes a battery of tests to determine the severity of the injury. This rule entitles the plaintiff to recover the cost of the diagnostic tests, as well as any “reasonable” future medical expenses.

Some jurisdictions adapted the allowance of medical expenses doctrine to allow plaintiffs recovery of medical expense damages, absent a present physical injury. In *Friends For All Children, Inc. v. Lockheed Aircraft Corp.*, 746 F.2d 816, 825 (D.C. Cir. 1984) (quoting David Rosenberg, *The Causal Connection in Mass Exposure Cases: A "Public Law" Vision of the Tort System*, 97 HARV. L. REV. 851, 856 (1984) ("[r]arely is any particular toxic agent the exclusive source of a given disease.")}; Slagel, supra note 8, at 852. The courts have “effectively” adapted the doctrine to provide recovery, absent a physical injury. In actuality, the courts concluded that the need for diagnostic testing constituted an injury, as defined by the Restatement (Second) of Torts, which states an injury is “the invasion of any legally protected interest of another.” *Friends For All Children, Inc. v. Lockheed Aircraft Corp.*, 746 F.2d 816, 826 (D.C. Cir. 1984) (quoting *RESTATEMENT (SECOND) OF TORTS* § 7 (1965)); see, e.g., *Hagerty*, 788 F.2d at 317 (fifth circuit allowed plaintiff who was drenched in a toxic substance, to recover past and future medical expenses, reasoning that plaintiff’s injury was
Lockheed Aircraft Corp., the Court of Appeals for the District of Columbia held that 149 children, who were victims of an airplane’s decompression and crash, were entitled to recover the cost of future diagnostic examinations even though there was no present manifestation of an injury. The court reasoned that equity requires that plaintiffs be able to recover the cost of diagnostic testing, regardless of whether the examinations were the result of a manifested or potential injury. The court further observed that such recovery serves the principles of tort law by compensating the victims and deterring future misconduct.

The court of appeals, affirming the judgment of the district court, reiterated its policy justifications. The court of appeals stated that society has an interest in protecting public health, and allowing a potentially deteriorating medical condition to go undiagnosed violates this interest. The court further stated that society also has an interest in the development of scientific data and diagnostic examinations produce such data. Lastly, the defendant has an interest in minimizing overall damages and the early diagnosis and treatment of an injury diminishes future damages. The common law adaptation of the avoidable consequences rule and the allowance of medical expense damages doctrine provide the legal foundation of the medical monitoring claim.

"discernible on the occasion when he was drenched with the toxic chemical"); Askey v. Occidental Chemical Corp., 102 A.D. 130, 137 (N.Y. App. Div. 1984) (Supreme Court of New York held that plaintiffs who suffered toxic exposure from leaking landfill, were entitled to recover reasonable medical expense damages, absent a physical injury).

249 746 F.2d at 825-26. The children were believed to be suffering from a neurological development disorder, classified as Minimal Brain Disorder (MBD). Id. at 819.

250 See id. at 825. The court illustrated its reasoning with the following example:

Jones is knocked down by a motorbike when Smith is driving through a light. Jones lands on his head with some force. Understandably shaken, Jones enters a hospital where doctors recommend that he undergo a battery of tests to determine whether he has suffered any internal head injuries. The tests proved negative but Jones sues Smith solely for what turns out to be the substantial cost of the diagnostic examinations. From the example it is clear that even in the absence of physical injury Jones ought to be able to recover the cost of various diagnostic examinations proximately caused by Smith’s negligent action.

Id. The court stated that clearly Jones ought to recover the costs of the diagnostic tests which were caused by Smith’s negligence. Id.

251 See id. at 824-25.

252 See id. at 823.

253 The court made a finding of fact, that without the medical expense damages, a significant portion of the children would not receive medical diagnostic testing. Id. at 822-23.

254 Id. at 823.

255 Id.

256 Blumenberg, supra note 7, at 678; Slagel, supra note 8, at 863. Every court that recognized
2. Medical Principles Underlying Medical Monitoring Damages

Medical monitoring damages originate from the well-established and documented medical principle which provides that the early detection, diagnosis, and treatment of an illness reduces the severity of the illness. In *Ayers v. Township of Jackson*, one expert testified that "the earliest diagnosis of illnesses, . . . could lead to improved prospects for cure, prolongation of life, relief of pain, and minimization of disability." This principle is a foundation for medical monitoring damages.

3. Public Policy Interests Supporting Medical Monitoring Damages

Numerous violations of public policy precipitated the courts' recognition of medical monitoring damages. The fundamental purposes of tort law—compensation and deterrence—were frustrated by the application of traditional tort doctrines to the field of toxic torts. Even after the incremental adaptations and the recognition of innovative damage claims, significant barriers to recovery existed for victims of toxic exposure. Without victim compensation, defendants were not liable for their wrongful acts; and without liability, the deterrence function of tort law was frustrated. The lack of fulfillment of these important public policies provided a foundation for the medical monitoring damages claim.

medical monitoring as an independent cause of action has utilized the principle of "medical expense" damages. See Slagel, *supra* note 8, at 863.

257 *Ayers v. Township of Jackson*, 525 A.2d 287, 311 (N.J. 1987) (Supreme Court of New Jersey states that the "increased risk of future cancer attributable to delay in diagnosis and treatment has become so widely accepted by the medical community that the existence of such harm could be reasonably inferred from this professional common knowledge.").

258 Testimony of Dr. Daum, the medical expert in *Ayers*, 525 A.2d at 304.

259 See id. at 311 (periodic medical examinations are necessary to facilitate early detection and some toxic tort plaintiffs would be deterred by the financial expense).

260 See Rudlin & Stravitz, *supra* note 12 (medical monitoring is a response by the courts, to the inequities caused by the application of traditional tort doctrine in toxic tort cases).

261 Slagel, *supra* note 8, at 849–50; see *Developments in the Law, supra* note 11, at 1630.

262 The incremental adaptations were the adoption of the "discovery rule," the rejection of the "single controversy rule," and the adoption of the "weak version" of the "preponderance of the evidence" rule. See *supra* notes 97–107, 115–18, 123–24, 138–39 and accompanying text.

263 The innovative damage theories recognized were fear of future illness and enhanced risk of future disease. See *supra* notes 185–231 and accompanying text.

264 See *supra* notes 204–05, 214–19, 224–31 and accompanying text.

265 See *supra* notes 204–05, 214–19, 224–31 and accompanying text.

266 See *supra* notes 204–05, 214–19, 224–31 and accompanying text.


268 See, e.g., *Ayers*, 525 A.2d at 311–12.
4. Medical Monitoring Damages: An Innovative Damage Theory

The medical monitoring claim was first recognized as an independent cause of action in the field of toxic torts in Ayers v. Township of Jackson.\textsuperscript{267} A class, consisting of 339 residents of the Legler area, brought suit against the Township of Jackson.\textsuperscript{268} The plaintiffs claimed that the Township operated its landfill negligently and as a result, their water supply was contaminated and they suffered toxic exposure.\textsuperscript{269} In addition to various other claims,\textsuperscript{270} the plaintiffs sought recovery for future medical monitoring expenses.\textsuperscript{271}

The Supreme Court of New Jersey held that the post-exposure, pre-symptom plaintiffs were entitled to recover the future costs of medical surveillance which were “reasonable and necessary.”\textsuperscript{272} The court stated that when determining what is “reasonable and necessary,” the following factors should be considered: the significance and extent of the exposure to the chemicals; the toxicity of the chemicals; the seriousness of the potential diseases; the relative increase in the chance of the onset of the disease; and the value of early diagnosis.\textsuperscript{273}

The Supreme Court of New Jersey overruled the appellate division, on this issue and unanimously rejected its use of the “reasonable probability” standard.\textsuperscript{274} The higher court stated that such a standard

\textsuperscript{267} Id.
\textsuperscript{268} See id. at 290; Blumenberg, supra note 7, at 680. The facts of Ayers v. Township of Jackson, illustrate the mass susceptibility to toxic exposure. John K. McNamara, Jr., Perfect Together: Ayers v. Jackson Township and Presymptom Medical Surveillance Awards in Toxic Torts, J. CONTEMP. HEALTH L. & POLICY 339, 345 (1989) (stating “the resultant dangers of toxic exposure to human health know no boundaries—social, economic, regional, political, or otherwise.”). In 1972, Jackson Township opened the Legler Landfill. Ayers, 525 A.2d at 292. The New Jersey Department of Environmental Protection (DEP) issued a permit, which mandated guidelines for the operation of the landfill. Id. The Township operated the landfill in violation of the guidelines, including the disposal of substances forbidden in the guidelines. See id. In 1978, it was discovered that toxic chemicals had leached from the landfill and contaminated the town water supply. Id. at 290. At least twelve hazardous substances, as identified by the EPA, were known to have contaminated the water supply. Id. at 292.
\textsuperscript{269} See Ayers, 525 A.2d at 292. The jury determined, in fact, that the actions of the Township were “palpably unreasonable.” See id. at 291.
\textsuperscript{270} The plaintiffs brought actions for the increased risk of future disease and emotional distress. See id. at 287. For a discussion of the court’s holdings on these claims, see supra notes 219, 225–27 and accompanying text.
\textsuperscript{271} Id. at 312–13.
\textsuperscript{272} See id. at 312.
\textsuperscript{273} The “reasonable probability” standard requires a quantification of the risk that the plaintiffs will develop cancer, and the quantification must indicate a “reasonable probability.” Ayers v. Township of Jackson, 493 A.2d 1314, 1323 (N.J. Super. Ct. 1985). The appellate division held that without a quantification of risk that plaintiff will contract cancer, the claim for medical monitoring damages must fail. Id.
“unduly impedes the ability of [the] courts" to accommodate the "emerging complexities of industrialized society and the consequent implications for human health."275

The Supreme Court of New Jersey reasoned that medical monitoring damages were consistent with well-accepted legal, medical, and public policy principles.277 The court reasoned that medical monitoring damages facilitate a basic tenet of tort law—when a person suffers damage, caused by the conduct of another, the responsible party should pay.278 Furthermore, the court reasoned that in the field of toxic torts, medical monitoring damages may be the only compensation available to exposure victims.279 The court also stated that medical monitoring damages serve the public interest in good health and the minimization of disease.280 The court argued that they facilitate access to medical testing for exposure victims,281 providing for early detection and diagnosis which reduces the severity of the disease.282

Beyond the legal and medical justifications, the Supreme Court of New Jersey was most influenced by the public policy objectives served by medical monitoring damages.283 The court indicated that medical monitoring damages will improve the compensation function of tort law.284 The court reasoned that victims of toxic exposure have an increased likelihood of proving causation.285 The court concluded that this occurs because medical monitoring claims are brought temporally close to the exposure, making the establishment of the requisite cause and effect relationship easier.286 The court further concluded that medical monitoring damages will improve the deterrence function of tort law because chemical manufacturers, distributors, and disposers will be held financially accountable for their conduct, which will deter future wrongful conduct.287 Lastly, the court reasoned that

275 Ayers, 525 A.2d at 308.
277 Id. at 298.
278 See id. at 311–12.
279 Id. at 311 (citing C. McCormick, Handbook on the Law of Damages § 90 at 323–27 (1935)).
280 See id.
281 See id. at 311. The court stated that absent medical monitoring damages, some plaintiffs would be deterred from receiving necessary diagnostic medical testing, by the cost. Id.
282 Id. Dr. Daum, the medical expert, testified that “the earliest diagnosis of illnesses, ... could lead to improved prospects for cure, prolongation of life, relief of pain, and minimization of disability.” Id. at 304.
283 See id. at 311–12.
284 See id.
285 Id.
286 See id.
medical monitoring damages reduce overall damage awards. The court argued that they facilitate early detection and diagnosis of exposure-related diseases which prevents or mitigates the seriousness of the disease, thereby reducing overall damages.

The Supreme Court of New Jersey's decision in Ayers represented a new approach to toxic torts, a radical "public policy" approach. An increasing number of jurisdictions adopted the rationale of the Ayers court and allowed recovery of medical monitoring expenses damages.

Some jurisdictions were as innovative as the Ayers court, and also recognized a claim for medical monitoring damages, absent a physical injury. For example, in Hansen v. Mountain Fuel Supply Co., the Supreme Court of Utah held that diagnostic examinations and recurring medical monitoring damages were recoverable, absent a physical injury. The court required the plaintiffs, who were exposed to as-

288 Id. at 312.
289 Id.
290 See McNamara, supra note 288, at 351; Blumenberg, supra note 7, at 678; see Rudlin & Stravitz, supra note 12 (described medical monitoring damages as one of the "most radical revolutions" in tort law).
292 See, e.g., Hansen, 858 P.2d at 972, 977-78 (Supreme Court of Utah held that plaintiffs who were exposed to asbestos were eligible to recover medical monitoring damages absent physical injury); Abuan v. General Elec. Co., 3 F.3d 329, 334 (9th Cir. 1993) (ninth circuit held medical monitoring damages may be awarded absent physical injury, provided plaintiffs prove they suffered a significant exposure to a proven toxic substance, the exposure increased their risk of contracting disease, making periodic diagnostic examination necessary, and early detection is possible and beneficial); Miranda v. Shell Oil Co., 15 Cal. Rptr. 2d 569, 570, 572 (Cal. Ct. App. 5th Dist. 1993), review granted, 847 P.2d 574 (1993) (Fifth Circuit Court of Appeals held that students who drank contaminated water could recover medical monitoring damages without evidence of a physical injury, provided they showed a significant exposure to a toxic substance, the toxicity of the chemicals, seriousness of potential disease, and the clinical value of early detection); Cook v. Rockwell Int'l Corp., 755 F. Supp. 1468, 1477 (D. Colo. 1991) (district court recognized medical monitoring claim, absent physical injury, in dicta); In re Paoli Railroad, 916 F.2d at 852 (third circuit held medical monitoring damages recoverable absent a physical injury); Merry v. Westinghouse Elec. Corp., 684 F. Supp. 847, 848-49 (M.D. Pa. 1988) (district court held that plaintiffs, whose water supply was contaminated with toxic chemicals, were entitled to recover medical monitoring damages, absent physical injury, provided they prove an exposure, a potential injury, and the need for early detection and treatment). Commentators similarly advocate the acceptance of medical monitoring damages, absent a physical injury. See also 2 AMERICAN LAW INST., supra note 36, at 380-81 (ALI concluded that medical monitoring damages are necessary to improve the tort system's treatment of toxic torts).
293 858 P.2d at 972, 978.
bestos, to show an exposure to a toxic substance; caused by defendant's negligence; resulting in an increased risk of a serious disease, illness, or injury; and for which early detection tests exist, are beneficial, and have been prescribed by a qualified physician.\textsuperscript{294} The court concluded that medical monitoring damages further the basic purposes of tort law.\textsuperscript{295} The court reasoned that they prevent victims of toxic exposure from experiencing financial and medical detriment as a result of the wrongful conduct of another.\textsuperscript{296} Furthermore, the court reasoned that medical monitoring damages provide compensation to victims of toxic exposure who are typically barred from recovery.\textsuperscript{297} The court also concluded that they promote deterrence.\textsuperscript{298} Lastly, the court reasoned that medical monitoring damages facilitate the early detection and diagnosis of exposure-related diseases.\textsuperscript{299}

The United States Court of Appeals for the Third Circuit adopted the reasoning of \textit{Ayers}, in \textit{In re Paoli Railroad Yard PCB Litigation v. Monsanto Company}.\textsuperscript{300} Thirty-eight persons, who were exposed to polychlorinated biphenyls (PCBs), a toxic substance, sued for medical monitoring damages.\textsuperscript{301} The court held that medical monitoring damages were recoverable, absent physical injury, provided the evidence indicated a toxic exposure; an increased risk of disease; the necessity of the medical exams; and the possibility of early detection and treatment.\textsuperscript{302} As in the \textit{Ayers} case, the court in \textit{In re Paoli} reasoned that medical monitoring damages facilitate the goals of the tort system\textsuperscript{303} by providing compensation for exposure victims; by encouraging plaintiffs to diagnose and treat injuries as early as possible; and by deterring irresponsible toxic discharges.\textsuperscript{304}

The success of the medical monitoring claim is limited in many jurisdictions by the retention of the traditional physical injury requirement.\textsuperscript{305} For example, in \textit{Ball v. Joy Technologies, Inc.}, the Dis-

\textsuperscript{294} Id. at 979.
\textsuperscript{295} See id. at 976.
\textsuperscript{296} See id. (an economically disadvantaged person may not be able to afford diagnostic tests, therefore without medical monitoring damages, the plaintiff would be denied potentially life-saving treatment).
\textsuperscript{297} Id.
\textsuperscript{298} Id.
\textsuperscript{299} Id. at 976--77.
\textsuperscript{301} Id. at 835.
\textsuperscript{302} Id. at 852.
\textsuperscript{303} Id.
\textsuperscript{304} Id.
\textsuperscript{305} Exposure-related diseases generally have a long latency, and toxic tort victims often cannot
District Court for the Southern District of Virginia held that plaintiffs, who suffered exposure to toxic PCBs, were not entitled to medical monitoring damages, absent a physical injury, and exposure did not constitute such an injury.\textsuperscript{306} The court reasoned that allowing such recovery would overburden the court system and potentially deprive the next generation of exposure victims adequate recovery.\textsuperscript{307}

Some courts have minimized this effect, however, by holding that any physical injury occurring at, or near, the time of exposure, constitutes a physical injury.\textsuperscript{308} For example, in \textit{Villari v. Terminix International, Inc.}, the District Court for the Eastern District of Pennsylvania held that the plaintiffs' suffering of nausea, dizziness, and general malaise one month after exposure was a sufficient physical injury to satisfy the medical monitoring requirement.\textsuperscript{309} The court further stated that the physical injury need not be attributable to the potential exposure-related disease.\textsuperscript{310}

Medical monitoring damages are hailed as the most successful innovative damage theory in the field of toxic torts.\textsuperscript{311} Commentators and courts state that they facilitate the early detection and diagnosis of disease by providing victims of toxic exposure the financial resources to undergo periodic medical examinations.\textsuperscript{312} Commentators and courts conclude that medical monitoring damages reincorporate an immediate physical injury. See Kristen Chapin, \textit{Toxic Torts, Public Health Data, and the Evolving Common Law: Compensation for Increased Risk of Future Injury}, 13 J. ENERGY NAT. RESOURCES & ENVTL. L. 129, 134 (1993); Slagel, supra note 8, at 859. See, e.g., Ball v. Joy Mfg. Co., 755 F. Supp. 1344, 1372 (S.D. W.Va. 1990), aff'd without op. sub nom. Ball v. Joy Technologies, Inc., 940 F.2d 561, reported in full, 958 F.2d 36 (4th Cir. 1992); Potter v. Firestone Tire and Rubber Co., 274 Cal. Rptr. 885, 900 (Cal. Ct. App. 6th Dist. 1990), aff'd in part, rev'd in part, 25 Cal. Rptr. 2d 550 (1993) (Sixth District Court of Appeals held that the award of medical monitoring damages without a physical injury was the creation of a new cause of action and it was "unwilling to create a new cause of action.").

\textsuperscript{306} See, e.g., 755 F. Supp. at 1372–73.

\textsuperscript{307} See id. at 1372.

\textsuperscript{308} See, e.g., Villari v. Terminix Int'l, Inc., 677 F. Supp. 330, 338 (E.D. Pa. 1987) (district court held that physical injury required to recover medical monitoring damages, but injury need not presently exist); Hagerty v. L. & L. Marine Services, Inc., 788 F.2d 315, 317, \textit{modified on other grounds}, 797 F.2d 256 (5th Cir. 1986) (fifth circuit allowed plaintiff, who was drenched in a toxic substance, to recover past and future medical expenses, reasoning that the plaintiff's suffering from dizziness, leg cramps, and a persistent stinging sensation in feet and fingers, immediately after the exposure, constituted a physical injury).

\textsuperscript{309} 677 F. Supp. at 332, 338.

\textsuperscript{310} See id.

\textsuperscript{311} Slagel, supra note 8, at 858.

compensation and deterrence into tort law.\[^{313}\] Defendants who are held liable for their wrongdoing are more likely to be deterred from perpetrating future wrongful conduct.\[^{314}\] Lastly, commentators and courts reason that medical monitoring damages provide the opportunity to gather essential scientific data on toxic exposure and its effects on humans.\[^{315}\]

While medical monitoring damages provide recovery to victims of toxic torts, they do not eradicate all the barriers to recovery resulting from the application of traditional tort principles to the field of toxic torts. For example, medical monitoring damages do not provide the requisite scientific data to satisfy the "more likely than not" or even the "reasonable probability" standard, necessary to prove causation.\[^{316}\] Therefore, tort law must continue to evolve to accommodate toxic torts.

D. The Public Health Fund

Another innovative damage theory in the field of toxic torts, which has been considered by the courts and awarded in private settlements, is the "public health fund."\[^{317}\] A fund is an "asset or group of assets set aside for a specific purpose."\[^{318}\] A "public health fund" is a fund that studies, develops, and distributes scientific data on the

\[^{313}\] See Ayers, 525 A.2d at 211; Hansen, 858 P.2d at 976–77; In re Paoli, 916 F.2d at 852. See also Slagel, supra note 8, at 889. See supra notes 277–89, 292–99, 300–304 and accompanying text.

\[^{314}\] See, e.g., Ayers, 525 A.2d at 311–12; Hansen, 858 P.2d at 976; In re Paoli, 916 F.2d at 852.

\[^{315}\] See Gara, supra note 3, at 270–71 (periodic testing may facilitate the gathering of scientific data on the health consequences of exposure to particular toxic substances). Once information is gathered it becomes a "public good:" it becomes available to any and all persons. See Lyndon, supra note 5, at 1809.

\[^{316}\] For a discussion of the standards of causation, see supra notes 120–24 and accompanying text.


\[^{318}\] See BLACK’S LAW DICTIONARY, supra note 83, at 464.
effect of toxic exposure on humans. The term "public health fund" is a generic term and includes various different types of funds. One common denominator is that public health funds are typically used in mass exposure cases. See, e.g., Cook, 778 F. Supp. at 514–15 (plaintiffs sought public health fund that gathered and distributed scientific data on exposed class); Barth, 673 F. Supp. at 1467–68, 1476 (public health fund was a fund to develop general scientific data on diagnosis and diseases related to benzene exposure); In re Three Mile Island, 557 F. Supp. at 97 (public health fund designed to "finance studies of the long term health effects of the TMI incident," including specific and general health studies).

The reasoning of the court in Friends for All Children, illustrates the natural progression of expanding the medical monitoring claim to include public health funds. Public health funds finance the collec-

319 See, e.g., Ayers v. Township of Jackson, 525 A.2d 287, 311 (N.J. 1987) (Supreme Court of New Jersey reasoned that medical monitoring damages were consistent with public health interests because they facilitate the early detection and diagnosis of exposure-related diseases); Hansen v. Mountain Fuel Supply Co., 858 P.2d 970, 976–78 (Utah 1993) (Supreme Court of Utah reasoned that medical monitoring damages facilitate the early detection and diagnosis of exposure-related diseases); In re Paoli Railroad Yard PCB Litig. v. Monsanto Co., 916 F.2d 829, 852 (3d Cir. 1990), cert. denied, 111 S. Ct. 1584 (1991) (third circuit reasoned that medical monitoring damages facilitate the early detection and diagnosis of disease). The early detection and diagnosis of exposure related diseases enhances the prospect for cure and/or prolonged life. Ayers, 525 A.2d at 304 (Dr. Daum, the medical expert testified that "the earliest diagnosis of illnesses . . . could lead to improved prospects for cure, prolongation of life, relief of pain, and minimization of disability."); Slagel, supra note 8, at 850.

320 See, e.g., Ayers v. Township of Jackson, 525 A.2d 287, 311 (N.J. 1987) (Supreme Court of New Jersey reasoned that medical monitoring damages were consistent with public health interests because they facilitate the early detection and diagnosis of exposure-related diseases); Hansen v. Mountain Fuel Supply Co., 858 P.2d 970, 976–78 (Utah 1993) (Supreme Court of Utah reasoned that medical monitoring damages facilitate the early detection and diagnosis of exposure-related diseases); In re Paoli Railroad Yard PCB Litig. v. Monsanto Co., 916 F.2d 829, 852 (3d Cir. 1990), cert. denied, 111 S. Ct. 1584 (1991) (third circuit reasoned that medical monitoring damages facilitate the early detection and diagnosis of disease). The early detection and diagnosis of exposure related diseases enhances the prospect for cure and/or prolonged life. Ayers, 525 A.2d at 304 (Dr. Daum, the medical expert testified that "the earliest diagnosis of illnesses . . . could lead to improved prospects for cure, prolongation of life, relief of pain, and minimization of disability."); Slagel, supra note 8, at 850.

321 See Blumenberg, supra note 7, at 663; Slagel, supra note 8, at 850. See supra notes 280–82 and accompanying text.

322 See, e.g., Ayers v. Township of Jackson, 525 A.2d 287, 311 (N.J. 1987) (Supreme Court of New Jersey reasoned that medical monitoring damages were consistent with public health interests because they facilitate the early detection and diagnosis of exposure-related diseases); Hansen v. Mountain Fuel Supply Co., 858 P.2d 970, 976–78 (Utah 1993) (Supreme Court of Utah reasoned that medical monitoring damages facilitate the early detection and diagnosis of exposure-related diseases); In re Paoli Railroad Yard PCB Litig. v. Monsanto Co., 916 F.2d 829, 852 (3d Cir. 1990), cert. denied, 111 S. Ct. 1584 (1991) (third circuit reasoned that medical monitoring damages facilitate the early detection and diagnosis of disease). The early detection and diagnosis of exposure related diseases enhances the prospect for cure and/or prolonged life. Ayers, 525 A.2d at 304 (Dr. Daum, the medical expert testified that "the earliest diagnosis of illnesses . . . could lead to improved prospects for cure, prolongation of life, relief of pain, and minimization of disability."); Slagel, supra note 8, at 850.

323 See, e.g., Ayers v. Township of Jackson, 525 A.2d 287, 311 (N.J. 1987) (Supreme Court of New Jersey reasoned that medical monitoring damages were consistent with public health interests because they facilitate the early detection and diagnosis of exposure-related diseases); Hansen v. Mountain Fuel Supply Co., 858 P.2d 970, 976–78 (Utah 1993) (Supreme Court of Utah reasoned that medical monitoring damages facilitate the early detection and diagnosis of exposure-related diseases); In re Paoli Railroad Yard PCB Litig. v. Monsanto Co., 916 F.2d 829, 852 (3d Cir. 1990), cert. denied, 111 S. Ct. 1584 (1991) (third circuit reasoned that medical monitoring damages facilitate the early detection and diagnosis of disease). The early detection and diagnosis of exposure related diseases enhances the prospect for cure and/or prolonged life. Ayers, 525 A.2d at 304 (Dr. Daum, the medical expert testified that "the earliest diagnosis of illnesses . . . could lead to improved prospects for cure, prolongation of life, relief of pain, and minimization of disability."); Slagel, supra note 8, at 850.
tion, development, and distribution of scientific data on the effects of toxic exposure on humans. Such data furthers the important public health interest of avoiding and minimizing disease.

One jurisdiction has recognized this natural progression. In *Cook v. Rockwell International Corp.*, the plaintiffs, who suffered exposure to hazardous substances, sought a fund for scientific studies, in addition to medical monitoring damages. The District Court for the District of Colorado held that a claim for a scientific fund, which assembled and disseminated data from the medical examinations of the exposed class, was cognizable. The court stated that “pooling the examination results is a reasonable complement to normal diagnostic testing that furthers the objective behind the [medical monitoring cause of action]—to assure the early diagnosis of a latent disease.”

An adaptation of medical monitoring damages, the medical monitoring fund, provides an additional foundation for public health funds. Medical monitoring damages are generally awarded in two ways—the traditional lump sum payment and a medical monitoring fund. A lump sum payment awards the plaintiff all past, present, and future recovery in one lump sum payment at the conclusion of the process to finance serious scientific study of the potential impact of health hazards on exposed groups. See also Gara, supra note 3, at 270–71 (periodic testing produces essential data on the health consequences of exposure-related diseases).

The elimination of scientific uncertainty regarding the effects of toxic chemicals on humans is accomplished by gathering data from exposed human populations, comparing it to the unexposed populations, and estimating the health risks to the broader population. Lyndon, supra note 5, at 1802.

See *Friends for All Children*, 746 F.2d at 823; *Cook v. Rockwell Int'l Corp.*, 778 F. Supp. 512, 515 (D. Colo. 1991) (combining examination results furthers the public health objective of early detection and diagnosis of disease); Barth v. Firestone Tire and Rubber Co., 673 F. Supp. 1466, 1478 (N.D. Cal. 1987) (without scientific fund plaintiffs were subject to misdiagnosis and mistreatment).

*Cook*, 778 F. Supp. at 515.

Id. at 514–15.


*See Cook*, 778 F. Supp. at 515. The district court clearly differentiated the type of fund sought by plaintiffs, which was cognizable, from a “generalized population based scientific study[],” which would not be recoverable, in a medical monitoring cause of action. Id. at 514–15. The same court, in an earlier decision, did not recognize the recovery of a general scientific fund as a valid cause of action. See *Cook*, 755 F. Supp. at 1478.

*Cook*, 778 F. Supp. at 515.

*E.g.*, *Ayers v. Township of Jackson*, 525 A.2d 287, 314 (N.J. 1987) (Supreme Court of New Jersey advocates use of medical monitoring fund to disperse medical monitoring damages); Barth v. Firestone Tire and Rubber Co., 673 F. Supp. 1466, 1476 (N.D. Cal. 1987) (medical monitoring fund adapted to include gathering and distributing information function).

*Cook*, 778 F. Supp. at 515; see *Ayers*, 525 A.2d at 314.
The majority of courts employ this method which comports with the traditional tort doctrine, the "single recovery rule."335 Some courts, in response to the unique characteristics of toxic torts, have advocated and/or recognized a novel alternative to the lump sum damage award—the medical monitoring fund.337 A medical monitoring fund is a supervised fund, typically utilized in mass exposure cases.338 It disperses medical monitoring damages to plaintiffs on a periodic basis.339 Medical monitoring funds centralize all known victims of a toxic exposure by associating them with a common entity.340 This centrality facilitates the collection and distribution of data.341

It was a natural progression to adapt medical monitoring funds to include a formalized public health fund component.342 Public health funds go a step beyond the medical monitoring fund. They assimilate

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335 Blumenberg, supra note 7, at 683; Poston, supra note 9, at 161.
336 The "single recovery rule," also known as the "single controversy rule," requires a party to recover all past, present, and future damages, against an adversary, in one cause of action. See supra notes 109–10 and accompanying text.
337 E.g., Ayers, 525 A.2d at 314 (Supreme Court of New Jersey, although refusing to overturn the jury awarded lump sum damages, advocated the creation of a court-supervised medical monitoring fund); In re Agent Orange Litig., 611 F. Supp. 1396, 1402–03 (E.D.N.Y. 1985) (district court stated that traditional lump sum disbursements were impossible in toxic exposure cases because of a "virtual absence of proof of causation [and] financially impractical because of [the] administrative costs . . ."); see also Blumenberg, supra note 7, at 702 & n.227. Commentators and courts advocating these funds reason that they are the most equitable method of compensation in toxic tort cases. E.g., Ayers, 525 A.2d at 313; see Blumenberg, supra note 7, at 702. The Supreme Court of New Jersey stated "[t]he indeterminate nature of damage claims in toxic tort litigation suggests that the use of court-supervised funds to pay medical-surveillance claims as they accrue, rather than lump-sum verdicts, may provide a more efficient mechanism for compensating plaintiffs." Ayers, 525 A.2d at 313. The court reasoned that such funds offset the defendant's liability by allowing payments from collateral sources and by limiting liability to the amount of expenses actually incurred. Further, the fund serves the public health interest by encouraging regular medical examinations and public interest by reducing insurance increases. Id. at 314. See also Blumenberg, supra note 7, at 693 (periodic payments reduce windfalls to toxic tort plaintiffs by limiting recovery to actual expenses).
338 E.g., Friends for All Children, Inc. v. Lockheed Aircraft Corp., 746 F.2d 816, 818 (D.C. Cir. 1984) (medical monitoring damages sought for class of 149 Vietnamese orphans); In re Three Mile Island Litig., 557 F. Supp. 96, 96 (M.D. Pa. 1982) (medical monitoring fund sought for thousands of residents living within twenty-five miles of the Three Mile Island Nuclear Plant); Blumenberg, supra note 7, at 702 n.227 (citing In re Fernald Litig., No. C-01-85-0149 (S.D. Ohio 1985) (medical monitoring fund sought for estimated 30,000 person class)).
339 Typically a medical monitoring fund awards a lump sum payment to the plaintiff at the conclusion of the litigation for all medical expenses already incurred and then either reimburses the plaintiff periodically for all future authorized medical expenses or performs the authorized medical monitoring examinations. See Blumenberg, supra note 7, at 687–88. For a more extensive discussion of the variations of medical monitoring funds, see id. at 687–91.
340 See Blumenberg, supra note 7, at 702.
341 See id. The pooling of data is impractical in lump sum awards due to the lack of diagnostic uniformity of examinations and the lack of centrality of subjects. Id.
the collected data, develop scientific data on the effects of toxic exposure on humans, and disseminate that useful information.\(^{343}\)

One jurisdiction has considered this natural progression.\(^{344}\) In *Barth v. Firestone Tire and Rubber Co.*\(^{345}\), the plaintiff,\(^{345}\) who was exposed to benzene, heavy metal compounds, and industrial toxins, brought a claim in equity seeking the creation of a public health fund.\(^{346}\) The public health fund sought by the plaintiff was to “gather and forward to treating physicians information relating to the diagnosis and treatment of [the] diseases” potentially caused by the toxic exposure.\(^{347}\) The District Court for the Northern District of California denied the defendant’s motion to dismiss,\(^{348}\) holding that the plaintiff satisfied the requisite elements of a claim in equity and was therefore, entitled to maintain his claim for the creation of a public health fund.\(^{349}\)

The court stated that the requisite elements of a claim in equity are: (i) the plaintiff has no available remedy at law; (ii) the plaintiff will suffer irreparable harm if the requested relief is not granted; and (iii) the plaintiff has exhausted all legal remedies.\(^{350}\) The court reasoned that the plaintiff had no legal remedy, nor was there a legal remedy supporting the creation of a public health fund.\(^{351}\) The court further reasoned that without the creation of such a fund, the plaintiff was subject to the misdiagnosis and treatment of exposure-related diseases and susceptible to re-exposure to the same harmful toxins.\(^{352}\) The court stated that “[p]ostponing or foregoing action that, if taken now, might result in the saving of human life would constitute irreparable harm.”\(^{353}\) Therefore, the court concluded that the plaintiff could maintain his claim in equity.\(^{354}\) The guiding principle of the court was the adaptability of tort law: “the greatest lesson that we can draw

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\(^{343}\) See *supra* note 319 and accompanying text.

\(^{344}\) See *Barth*, 673 F. Supp. at 1476–78.

\(^{345}\) A single plaintiff brought this action on behalf of an unidentified class of persons. *Id.* at 1468. The plaintiff alleged that the defendant exposed all of its manufacturing employees, over 5,000 persons, to toxic substances from 1963 until 1981. *Id.*

\(^{346}\) *Id.* at 1467–68.

\(^{347}\) *Id.* at 1476. The fund was also designed to locate the unidentified exposed workers and inform them of the exposure. *Id.*

\(^{348}\) *Id.* at 1478. This case was settled on January 13, 1992. The plaintiffs did not receive specific medical monitoring or health fund damages. Blumenberg, *supra* note 7, at 709 n.266.

\(^{349}\) See *Barth*, 673 F. Supp. at 1478.

\(^{350}\) *Id.* at 1477.

\(^{351}\) *Id.* at 1477–78.

\(^{352}\) *Id.* at 1478.

\(^{353}\) *Id.*

\(^{354}\) *Id.*
from the common law of torts to apply here is that the system must evolve to meet the needs of society.”

The most successful utilization of public health funds, to date, has been in private settlement actions. Public health funds have been used to assimilate and disseminate essential scientific information on toxic exposure and its effect on humans. For example, in In re Three Mile Island Litigation, a five-million dollar “Public Health Fund” was established to “finance studies on the long term health effects of the [Three Mile Island] incident.” The Public Health Fund was designated to monitor radiation releases from Three Mile Island (TMI) Nuclear Power Plant; fund studies concerning exposure-related health risks; fund public education programs of plaintiffs and treating physicians concerning the early detection of cancer and exposure-re-

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855 See id. at 1469. Influential in the decision of the court was Prosser and Keeton’s discussion of tort law. Id.

856 See In re Three Mile Litig., 557 F. Supp. 96, 96–97 (M.D. Pa. 1982) ($5 million public health fund was established); Three Mile Island Public Health Fund, 1989-1990 Annual Report 9 (hereinafter TMI Public Health Fund) (public health fund has produced and disseminated important scientific data). See also In re Fernald Litig., No. C-1-85–148, 1989 WL 267039, at *2, *10 (S.D. Ohio, Sept. 29, 1989) ($73 million fund established for “extensive long-term medical monitoring of individuals in class” as well as epidemiological studies of residents “to determine if unusual health effects have been experienced.”); Brennan, supra note 317, at n.255 (citing In re Heptachlor Litig., Civ. Nos. 76335, 76338, Memorandum in Support of Motion for Approval of Disbursements (Mar. 31, 1988) (public health fund included epidemiological studies, designed to identify an increased risk of disease due to an exposure to heptachlor).

857 See Lyndon, supra note 5, at 1802.

858 557 F. Supp. at 97. On March 28, 1979, the Three Mile Island (TMI) nuclear power plant accident occurred, emitting toxic radioactive substances into the atmosphere. Three classes of persons living within a twenty-five mile radius of the plant sued TMI. Class I consisted of business entities suffering economic loss; Class II consisted of all individuals who suffered economic harm, such as evacuation expenses, lost wages, and diminished property values; and Class III consisted of all persons seeking future medical detection damages. Id. at 97 n.1. Classes I and II received $20 million in damages and Class III was the recipients of the $5 million “Public Health Fund.” Id.
lated diseases; and fund general research, including epidemiological studies into the effects of low level radiation on human health.\textsuperscript{359}

The TMI Public Health Fund has studied the effects of radiation on humans, developed scientific data, and distributed that data.\textsuperscript{360} Since the settlement agreement of September 9, 1981,\textsuperscript{361} the Public Health Fund has undertaken numerous scientific studies, including epidemiological studies, on the patterns of childhood and adult cancer in radiation exposure victims\textsuperscript{362} and the effects of radiation and exposure stress on pregnant women.\textsuperscript{363}

The Public Health Fund distributes its scientific results via its Annual Report, independent publications, and industry publications.\textsuperscript{364} Annually, the Public Health Fund publishes the progress of its research, including any significant scientific discoveries.\textsuperscript{365} For example, in its 1989–90 Annual Report, the Public Health Fund reported that "noble gases" were the major radioactive substance released from TMI.\textsuperscript{366} It further reported that a "meteorological dispersion model" had been developed which accurately estimates the patterns of doses received by the communities surrounding TMI.\textsuperscript{367}

Numerous independent publications are available through the Public Health Fund.\textsuperscript{368} These address topics such as the increased risk of breast cancer from low-level radiation exposure and the carcinogen effects of low-level radiation.\textsuperscript{369} Additionally, the Public Health Fund

\textsuperscript{359} Stipulation and Agreement of Settlement, Three Mile Island Litigation (No. 79–0432), at 12–14. The Public Health Fund was to be used for any of the following purposes:
(a) improving the monitoring of radiation releases from TMI . . . ;
(b) funding of studies or analyses relating to the possible health related effects . . . resulting from the TMI accident . . . ;
(c) funding of public education programs involving the general public residing or working within twenty-five miles of TMI or the medical community within or serving that region on the subjects of (i) cancer and early detection of cancer generally and the health effect of radiation . . . ;
(d) funding the preparation of or the means to implement or assist in implementing a comprehensive plan of evacuation or emergency assistance . . . ; and
(e) funding general research into the effects of low level radiation on human health and related studies and analyses.

\textsuperscript{360} Id.

\textsuperscript{361} See infra notes 362–74 and accompanying text.

\textsuperscript{362} See In re Three Mile Island, 557 F. Supp. at 96.

\textsuperscript{363} See TMI Public Health Fund, supra note 356, at 9–14.

\textsuperscript{364} Id. at 15–16.

\textsuperscript{365} See infra notes 365–74 and accompanying text.

\textsuperscript{366} TMI Public Health Fund, supra note 356, at 2–6.

\textsuperscript{367} Id. at 3.

\textsuperscript{368} Id. at 3–4.

\textsuperscript{369} For a comprehensive list of publications, see id. at 30–31.

\textsuperscript{370} Id.
distributes significant scientific information through industry publications. 370 For example, the Public Health Fund published the conclusions of one of its epidemiology studies in the American Journal of Epidemiology. 371 The epidemiological study investigated the effects of radiation exposure on 160,000 adults and children living near TMI. 372 While the study found no significant connection between exposure to the TMI accident and leukemia, it did identify a positive trend between routine emissions from TMI and leukemia and other cancers in children. 373 The study further revealed a statistically significant relationship between childhood cancer in the TMI area and "outdoor background gamma radiation from cosmic and terrestrial sources." 374

While public health funds have not yet been widely recognized by the courts, they have been extremely successful in private settlements. 375 Public health funds have developed scientific data on the effects of toxic exposure on humans and disseminated that information to victims of toxic exposure, treating physicians, and other industry professionals such as scientists and epidemiologists. 376


Public health funds are a novel, innovative damage theory. 377 But the "mere fact that a claim is novel does not defeat it." 378 When courts consider a novel claim they "weigh . . . the interests for which the plaintiff demands protection against the defendant's claim to untrammeled freedom in furtherance of defendant's desires . . . " in conjunction with the interests of society. 379 Public health funds provide substantial benefits to society and the victims of toxic exposure and

370 Id. at 9.
372 Id. at 9.
373 Id. at 11.
374 Id. at 12.
375 See supra notes 356-79 and accompanying text.
376 See id.
377 While public health funds have been considered in several courts, no jurisdiction has recognized a public health fund as defined by this Comment. See, e.g., Cook v. Rockwell Int'l Corp., 778 F. Supp. 512, 514-15 (D. Colo. 1991) (court recognized scientific fund for pooling data of exposed plaintiffs not general scientific study); Barth v. Firestone Tire and Rubber Co., 673 F. Supp. 1466, 1476, 1478 (N.D. Cal. 1987) (claim for equivalent of general public health fund survived motion to dismiss but was not decided because case was settled).
378 PROSSER & KEETON, supra note 11, § 3 at 18.
379 Id. at 16.
minimal detriment to toxic substance manufacturers, distributors, and/or disposers.

A. Societal Interests Benefit from Public Health Funds

Public health funds facilitate the attainment of several important societal interests: the interest in public health and the minimization of disease; the interest in the development of scientific data; and the interest in the deterrence of future toxic exposure. It is well-established that society has an interest in the preservation of public health and the minimization of disease. Early detection and diagnosis of disease protects this important societal interest. But in the field of toxic torts essential scientific data concerning the causes and symptoms of exposure-related diseases is inconclusive or non-existent. Without such data, early detection and diagnosis is difficult, if not impossible, to achieve.

Public health funds promote society's interest in the minimization of disease by developing and distributing essential scientific data, which facilitates the early detection of disease. Public health funds examine populations of exposed persons; develop essential knowledge, such as what diseases are likely to develop and the early symptoms of those diseases; and distribute the knowledge to the victims of exposure and their treating physicians. This was illustrated by the TMI Public Health Fund. The development and distribution of this scientific knowledge will assist in the early detection and diagnosis of leukemia in children, in the TMI community and in all other children exposed to "noble gas" radiation. This function of public health funds facilitates the societal interest in the maintenance of health and the minimization of disease.

Society has an interest in the development and dissemination of scientific data on the effects of toxic exposure on humans. One commentator explained, "[the] improved production and dissemina-
tion of toxicological data would go far to alleviate [scientific uncertainty]. Presently, in the field of toxic torts, such data is inconclusive or non-existent. Without scientific data, society is virtually incapable of protecting itself against the life-threatening effects of toxic exposure.

The fundamental purpose of public health funds is to develop and distribute scientific data, including epidemiological studies, which are considered the “best” evidence. Public health funds are capable of fulfilling their purpose. For example, the TMI Public Health Fund conducted epidemiological studies on the effects of low-level radiation on children; developed scientific data; and disseminated their results. Public health funds advance this important societal interest.

Society has a tremendous interest in the deterrence of future toxic exposures because toxic chemicals are a threat to every member of our society. They exist in every home and are virtually untested concerning their effects of humans. They are improperly disposed of and frequently and suddenly released. Exposure to them causes cancer and other equally insidious diseases which are life-threatening. This pervasiveness of toxic chemicals and the severity of exposure-related diseases illustrates the magnitude of society’s deterrence interest.

Tort law advocates that liability deters future wrongful conduct. The unique nature of toxic torts created virtually insurmountable barriers to recovery. These barriers hinder the deterrence function of tort law. In response to these barriers the courts implemented incremental adaptations, such as the adoption of the “discovery rule,” the rejection of the “single controversy rule,” and the adoption of a “weak version” of the “preponderance of the evidence rule.” Additionally, the courts have recognized numerous innovative dam-

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390 Lyndon, supra note 5, at 1797.
391 See supra notes 67–77 and accompanying text.
392 See id.
393 See supra notes 135–37 and accompanying text.
394 See supra note 359 and accompanying text.
395 See supra notes 31–34 and accompanying text.
396 See supra note 36 and accompanying text.
397 See supra notes 39–42.
398 See supra note 54 and accompanying text.
399 See supra note 54 and accompanying text.
400 See supra note 11, § 4 at 25.
401 See supra notes 78–81 and accompanying text.
402 See supra notes 168–70 and accompanying text.
403 See supra notes 99–107 and accompanying text.
404 See supra notes 115–18 and accompanying text.
405 See supra notes 123–24 and accompanying text.
age theories—fear of future disease, enhanced risk of future illness, and medical monitoring damages. While these adaptations have provided some recovery to victims of toxic exposure they have not sufficiently eradicated all barriers to recovery in toxic torts.

Public health funds would reincorporate the deterrence function into tort law. The recognition of public health funds would alert manufacturers, distributors, and disposers of toxic chemicals that they are liable for wrongful conduct. They would know that they are going to be held liable for the expense of developing conclusive scientific data on toxic substances and their effect on humans. While this liability would undoubtedly deter wrongful conduct, it might also facilitate some responsible conduct. Toxic substance manufacturers may implement more extensive pre-production testing to identify potentially hazardous substances. Also manufacturers, distributors, and disposers may limit their use of untested products in an attempt to avoid the known commodity of public health fund liability. For these reasons, public health funds facilitate the important deterrence function of tort law.

Public health funds also provide the ultimate deterrence function—the removal of life-threatening toxic chemicals from society. Public health funds help to determine the excess risk of disease caused by a toxic chemical. When scientific data is developed, indicating that a toxic substance is highly dangerous, that chemical should be removed from society. Without the data produced by public health funds, that same dangerous substance might remain in mainstream society and continue to threaten us all.

B. Toxic Exposure Victims Benefit from Public Health Funds

Public health funds provide significant benefits to victims of toxic exposure. They facilitate the early detection and diagnosis of expo-

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405 See supra notes 189–205 and accompanying text.
406 The success of the fear of future illness and enhanced risk of future illness claims were severely limited by the adherence to physical injury requirements and the "reasonable medical certainty" standard. See supra notes 204–65, 214–19 and accompanying text.
407 Medical monitoring damages provided the greatest recovery to victims of toxic exposure. While this was a revolutionary adaptation, its scope is limited. Medical monitoring damages provide compensation for periodic medical examinations, they do not ease the barriers of recovery for plaintiffs who develop an exposure-related disease and seek damages. See supra notes 305–07, 316 and accompanying text.
408 See supra notes 168–69, 287, 298, 304 and accompanying text.
409 See supra note 358 and accompanying text.
410 This statement is premised on belief that governmental regulations would ban or significantly regulate the use of toxic chemicals that were deemed to be highly dangerous to humans. The validity of this premise is beyond the scope of this Comment.
sure-related disease\textsuperscript{411} and significantly reduce the barriers to recovery that have plagued victims of toxic exposure since the inception of toxic torts.\textsuperscript{412}

Public health funds benefit victims of toxic exposure by facilitating the early detection and diagnosis of disease, thereby minimizing the severity of the resulting injury. Exposure-related diseases, such as cancer, can be life-threatening.\textsuperscript{413} It is well-documented that the early diagnosis and treatment of exposure-related diseases is the best method for prolonging life and minimizing disability.\textsuperscript{414} Without substantive scientific data on the causes and symptoms of exposure-related diseases, victims of toxic exposure are prey to misdiagnosis and mistreatment, each of which is potentially fatal.\textsuperscript{415}

Public health funds examine populations of exposed persons;\textsuperscript{416} develop essential knowledge, such as what diseases are likely to develop and the early symptoms of those diseases;\textsuperscript{417} and distribute the knowledge to the victims of exposure and their treating physicians.\textsuperscript{418} This knowledge improves the potential for early detection, diagnosis, and treatment of exposure-related diseases and may literally be the difference between life and death.\textsuperscript{419} No greater interest exists than that of the toxic exposure victim. Public health funds further this interest.

Public health funds reduce the barriers to recovery, which have plagued victims of toxic exposure. Tort law's basic tenet provides that plaintiffs should be compensated when they are wrongfully injured by the conduct of others.\textsuperscript{420} The long latency and scientific uncertainty of exposure-related diseases made it virtually impossible for toxic tort victims to recover under traditional tort doctrine.\textsuperscript{421} While the courts have implemented incremental adaptations of tort law\textsuperscript{422} and recognized innovative damage theories,\textsuperscript{423} these adaptations have not sufficiently eradicated these barriers.

\textsuperscript{411} See infra notes 413–19 and accompanying text.
\textsuperscript{412} See infra notes 420–32 and accompanying text.
\textsuperscript{413} See supra note 54 and accompanying text.
\textsuperscript{414} See supra notes 257–59 and accompanying text.
\textsuperscript{415} See id.
\textsuperscript{416} See supra notes 319, 326, 372–74 and accompanying text.
\textsuperscript{417} See id.
\textsuperscript{418} See supra notes 326, 364–74 and accompanying text.
\textsuperscript{419} See supra notes 257–59 and accompanying text.
\textsuperscript{420} See supra note 45 and accompanying text.
\textsuperscript{421} See supra note 52 and accompanying text.
\textsuperscript{422} See supra notes 97–107, 115–18, 124 and accompanying text.
\textsuperscript{423} See supra notes 189–206, 206–27, 232–37, 267–304 and accompanying text.
The most significant barrier remaining is the burden of proving causation.\textsuperscript{424} Whether a jurisdiction adopted the “more likely than not” standard or the “reasonable probability” standard,\textsuperscript{425} the absence of conclusive scientific data has virtually ensured that the toxic tort plaintiff cannot satisfy either standard.\textsuperscript{426} Public health funds will facilitate the development of conclusive scientific data capable of satisfying even the higher “more likely than not” standard. Further, by disseminating crucial scientific information, sharing results with other epidemiologists, and coordinating research,\textsuperscript{427} public health funds will assist in the development of “public” scientific data\textsuperscript{428} and nationwide databases of information.\textsuperscript{429} This development and dissemination of scientific data, accomplished by public health funds, will assist victims of toxic exposure in satisfying their burden of causation, thereby eradicating a major barrier to recovery.

Public health funds eradicate numerous practical barriers to recovery for victims of toxic exposure. Previously the low probability of recovery discouraged victims of exposure from bringing actions or encouraged premature settlement.\textsuperscript{430} Public health funds improve the opportunity for recovery, thereby eradicating this barrier. Additionally, victims of toxic exposure are often discouraged or precluded from bringing an action due to the inordinate expense of the requisite scientific data and expert testimony.\textsuperscript{431} Public health funds provide scientific data for the “public good;” data that is made available to everyone.\textsuperscript{432} The increased availability of scientific data will eradicate this barrier to recovery.\textsuperscript{433}

C. Defendant’s Detriment from Public Health Funds is Minimal

When considering the interests of the defendant, one must consider “the defendant’s claim to untrammeled freedom in the furtherance of defendant’s desires, together with the importance of those desires

\textsuperscript{424} See supra notes 120–143 and accompanying text.
\textsuperscript{425} See supra notes 120–24 and accompanying text.
\textsuperscript{426} See supra note 127 and accompanying text.
\textsuperscript{427} This role of public health funds was illustrated in the TMI Public Health Fund. When the Fund discovered the link between noble gases and leukemia, it considered the coordination of research with studies in Britain. See supra notes 366–67 and accompanying text.
\textsuperscript{428} “Public” data is that which is available to all. See Lyndon, supra note 5, at 1809.
\textsuperscript{429} See supra notes 76, 360 and accompanying text.
\textsuperscript{430} See supra notes 157–58 and accompanying text.
\textsuperscript{431} This barrier is exacerbated by fact that economically disadvantaged are most often victims of toxic exposure. See supra note 156 and accompanying text.
\textsuperscript{432} Scientific data which is a “public good” is a “good whose consumption by one user does not diminish its availability or benefit to any other user.” Lyndon, supra note 5, at 1809.
\textsuperscript{433} Once data is developed it is easily transferable at a low marginal cost. See id.
themselves." The defendant has an interest in the maximization of financial profits. However, this is not an unfettered interest. Since, this interest is not a protected interest, additional factors must be considered when assessing the overall detriment to the defendant.

Manufacturers, distributors, and disposers of toxic substances reap tremendous benefits from their use of toxic substances and the recognition of public health funds will not substantially reduce these benefits. It is estimated that the development of scientific data on a toxic substance costs "up to one million dollars." While this figure appears large, it is minimal in comparison to the overall profits of chemical companies. This financial detriment is further diminished when the scope of public health funds is considered. Public health funds are best utilized in mass exposure cases which, while too frequent, are not a common occurrence. For these reasons, public health funds will not substantially reduce defendant's economic profits.

Manufacturers and distributors of toxic substances are allowed to utilize and profit from toxic substances without knowing their effect, harmful or otherwise, on humans. In fact, they are virtually insulated from mandatory testing by medical ethics considerations, lack of governmental regulations, and the long latency of exposure-related diseases. Public health funds require the defendant to finance scientific testing that should have occurred in the early stages of the development and production of toxic substances. Since public health funds merely require something that should have already occurred, the defendant's detriment is minimal.

Lastly, a basic tenet of tort law is that between an innocent victim and a wrongdoer, the wrongdoer should bear the expense of its actions. It is most equitable for the defendant and not the innocent toxic exposure victim to bear the cost of the collection, development, and dissemination of scientific data. For these reasons, the overall

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434 PROSSER & KEETON, supra note 11, § 3 at 16-17.
436 See PROSSER AND KEETON, supra note 11, § 3 at 16-17.
437 See supra note 70 and accompanying text.
438 In 1975 the after-tax profits of the chemical industry were $5.5 billion. Lyndon, supra note 5, at 1797 n.66 (citing S. Epstein, POLITICS OF CANCER 72-73 (1978)).
439 See supra note 68 and accompanying text.
440 See Lyndon, supra note 5.
441 See supra note 77 and accompanying text.
442 See supra note 45 and accompanying text.
detriment to defendants imposed by the recognition of public health funds is minimal.

D. Balance The Interests And Recognize Public Health Funds

Public health funds significantly benefit the interests of society and the victims of toxic exposure. While they diminish the potential profits of the manufacturers, distributors, and disposers of toxic substances, the overall detriment is minimal. When these competing interests are balanced, the result must be in favor of "the greatest happiness [and health] of the greatest number."\(^{443}\) The obvious result is the recognition of public health funds. This is the only equitable outcome for society.

V. CONCLUSION

The massive commonplace use of untested toxic chemicals, the improper disposal of such chemicals, and the sudden uncontrolled release of them has caused a proliferation of toxic exposure victims. The unique nature of toxic torts—the long latency and scientific uncertainty of cancer and exposure-related diseases—created virtually insurmountable barriers to recovery for toxic tort victims. In the absence of legislative recovery, the courts have incrementally adapted tort law and recognized innovative damage theories in an attempt to eradicate these barriers. While some victims of toxic exposure are compensated within the tort system, particularly by the innovative damage theory of medical monitoring damages, significant barriers to recovery remain.

Public health funds are the essential next step in the evolution of tort law to accommodate toxic torts. Public health funds provide tremendous benefits to society, including the protection of the public health and the minimization of disease. Public health funds also significantly benefit the victims of toxic exposure by facilitating the early detection of disease and eradicating the barriers to compensation. In light of the significance of these interests, the detriment to the defendant is minimal. The weight of the interests clearly favors recognition of the novel claim, public health damages. Whether a public health fund is recognized as a component of medical monitoring damages or as its own cause of action in equity, public health funds must be recognized and fully utilized if our society is to be free of the threat of toxic chemicals.

\(^{443}\) See Prosser & Keeton, supra note 11, § 3 at 16-17.