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## PERFORMATIVE CAUSATION

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*Specific causation requires plaintiffs to prove that their injury was caused by this defendant and not merely that an injury like theirs could have been caused by a party like the defendant. Science, however, cannot regularly supply such proof: scientific evidence of causation typically comes via epidemiology and statistics, which provide a bounty of detail about population-level effects but little that translates to individual questions of causation. This means that in the considerable number of cases in which medical causation is uncertain—including (but not limited to) nearly all mass torts—plaintiffs are required to prove what science cannot. Even where studies show that widespread harm is a statistical certainty, without any individual-level evidence proving specific causation, no plaintiff should be able to recover.*

*But yet some do. This Article’s detailed examination of the specific causation requirement reveals how, in the face of specific causation’s impossible and seemingly unjust demands, judges and juries have grown increasingly receptive to “performative causation,” proofs of causation that rely on shoddy scientific evidence and emotional appeals. This impulse, however well-meaning, routinely facilitates judgments against the wrong defendants or on behalf of the wrong plaintiffs. The result is a mass denial of justice—to countless plaintiffs deprived of any hope of recovery and to numerous defendants held liable for harms they may not have committed.*

*By illustrating the substantive and procedural dimensions of specific causation’s challenges, this Article provides a foundation for future discussions of reform. In its final section, this Article puts forward its own novel proposal: a private law-administrative hybrid model that uses statistical evidence to grant proportional recoveries to plaintiffs. By better aligning the questions asked by the law with the answers provided by*

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*science, this model offers a promising mechanism for resolving individual questions of causation—as well as a template for how mass torts resolutions can capture the best and guard against the worst features of both private law and public law adjudicatory systems.*

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#### INTRODUCTION

On December 10, 1990, Connie Chung detailed the dangers of breast implants to a national audience.<sup>1</sup> This news report crested a rising tide of

1. *Face to Face with Connie Chung* (CBS television broadcast Dec. 10, 1990), <http://yukonmom47.tripod.com/id8.html> [<https://perma.cc/YE35-TXQT>].

anti-implant publicity and, predictably, was followed closely by a flood of breast implant litigation. However, although implants had come into widespread use thirty years prior to Chung's sensational report, no link between implants and illness was shown until over a decade *after* Chung's interview purporting to document the implants' hazards.<sup>2</sup> Even today, now over twenty-five years later, little evidence exists explaining how breast implants cause disease.<sup>3</sup> Yet, thousands of plaintiffs have recovered billions of dollars due to an as-of-yet undiscovered mechanism of injury. How can it be that jurors and judges have repeatedly found causation—a required element of tortious liability—where even the world's leading scientists are baffled?

This Article proposes that the answer to this question lies in the tort system's confused approach to scientific proof of causation. On the one hand, the law is too strict, requiring evidence of specific causation that science cannot often supply: the statistical analyses regularly used to determine causation will rarely prove individual-level causation by a preponderance of the evidence. As a result, countless plaintiffs lose or fail to bring claims even when there is little doubt that some defendant's negligence caused widespread injury. On the other hand, though, the law is too lax, as courts have a great deal of discretion when it comes to the crucial threshold question of a study's validity: under *Daubert*, a study that is only *probably* reliable may be admitted as dispositive evidence of causation.<sup>4</sup> This opens the door for judges and juries to anchor moral-seeming judgments—like those seeking to remedy apparent injustices resulting from the law's strictness—on infirm scientific foundations.<sup>5</sup> Together, these shortcomings combine to create a system ripe for injustice and ripe for abuse; and, as a result, false positives and false negatives abound throughout this large subset of tort law.<sup>6</sup>

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2. For more information on the studies discovering this link, see generally Louise A. Brinton et al., *Mortality Among Augmentation Mammoplasty Patients*, 12 EPIDEMIOLOGY 321 (2001); Louise A. Brinton et al., *Cancer Risk at Sites Other Than the Breast Following Augmentation Mammoplasty*, 11 ANNALS EPIDEMIOLOGY 248 (2001); Sheryl Gay Stolberg, *Study Links Breast Implants to Lung and Brain Cancers*, N.Y. TIMES, Apr. 26, 2001, at A19.

3. E.g., Denise Grady, *Breast Implants Are Linked to Rare but Treatable Cancer*, F.D.A. FINDS, N.Y. TIMES, Jan. 27, 2011, at A18 (“[I]t [i]s not yet known for sure [how] the implants really increase the risk of cancer . . .”).

4. *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 594 (1993); see, e.g., *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 744 (3d Cir. 1994).

5. The law is also incoherent. The statistical evidence needed to satisfy the specific causation requirement is influenced as much by baseline risk (which should have no bearing on liability) as it is by effect size.

6. In this context, a scientifically unjustified award of liability constitutes a false positive; and a scientifically unjustified defense verdict constitutes a false negative.

This Article uses the breast implant litigation to illustrate the closely intertwined substantive, evidentiary, and procedural challenges created by the misalignment between what the law requires and what science can provide. These challenges will manifest in nearly every case in which the mechanism of causation is uncertain—from stand-alone lawsuits<sup>7</sup> to mass torts like Bendectin,<sup>8</sup> Agent Orange,<sup>9</sup> MBTE,<sup>10</sup> talc,<sup>11</sup> and glyphosate.<sup>12</sup>

As this discussion reveals, both substantive and procedural reform is required to remedy these issues. Substantively, this Article proposes that proportional recovery tailored to statistical proofs of causation will better satisfy tort law's compensatory justice and utilitarian aims. Such a reform, however, will further exacerbate private law's institutional difficulties with resolving challenging scientific disputes, especially in the context of mass torts. And so, this Article proposes, significant procedural restructuring is needed as well: the quasi-public nature of the substantive and procedural changes that must be made to resolve these problems militate strongly in favor of a resolution that pairs substantive reform with institutional redesign.

Part I of this Article describes this problem, revealing the close connection between tort law's substantive inadequacy and judges' and juries' susceptibility to what this Article calls "performative causation," proofs of causation that rest on shoddy scientific evidence and emotional appeals.<sup>13</sup> Part II analyzes this problem through the dual lenses of

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7. See, for example, *Wells v. Ortho Pharmaceutical Corp.*, 788 F.2d 741, 744–45 (11th Cir. 1986), in which even the judge acknowledged that it was scientifically "inconclusive" whether the defendant's spermicidal jelly caused the plaintiff child's birth defects—before, nevertheless, finding in the plaintiff's favor. See also Stephen D. Sugarman, *The Need to Reform Personal Injury Law Leaving Scientific Disputes to Scientists*, 248 SCI. 823, 823 (1990), [https://www.law.berkeley.edu/files/The\\_Need\\_to\\_Reform\\_Personal\\_Injury\\_Law\\_Leaving\\_Scientific\\_Disputes\\_to\\_Scientists.pdf](https://www.law.berkeley.edu/files/The_Need_to_Reform_Personal_Injury_Law_Leaving_Scientific_Disputes_to_Scientists.pdf) [<https://perma.cc/H7U4-DB4S>].

8. E.g., MICHAEL D. GREEN, *BENDECTIN AND BIRTH DEFECTS: THE CHALLENGES OF MASS TOXIC SUBSTANCES LITIGATION* 26–43 (1996).

9. See, e.g., PETER H. SCHUCK, *AGENT ORANGE ON TRIAL: MASS TOXIC DISASTERS IN THE COURTS* *passim* (1987).

10. See, e.g., Ann Al-Bahish et al., *Emerging Toxic Torts: MBTE and Mold*, 17 NAT. RESOURCES & ENV'T 219, 220 (2003).

11. See *Talcum Powder and Cancer*, AM. CANCER SOC'Y (Dec. 4, 2018), <https://www.cancer.org/cancer/cancer-causes/talcum-powder-and-cancer.html> [<https://perma.cc/JV86-XTKL>].

12. See generally, e.g., Christopher J. Portier et al., *Differences in the Carcinogenic Evaluation of Glyphosate Between the International Agency for Research on Cancer (IARC) and the European Food Safety Authority (EFSA)*, 70 J. EPIDEMIOLOGY & COMMUNITY HEALTH 741 (2016) (discussing the ongoing scientific debate over glyphosate's—the active ingredient in Roundup—cancer-causing properties); Tina Bellon, *California Jury Hits Bayer with \$2 Billion Award in Roundup Cancer Trial*, REUTERS (May 13, 2019, 2:21 PM), <https://www.reuters.com/article/us-bayer-glyphosate-lawsuit/california-jury-hits-bayer-with-2-billion-award-in-roundup-cancer-trial-idUSKCN1SJ29F> [<https://perma.cc/658X-C9HW>].

13. Unlike some of the more familiar proof paradoxes described in Michael Pardo's piece, Michael

utilitarianism and corrective justice, the two primary competing justifications for the tort system. Part III then applies this theoretical framework to several substantive proposals to reform mass tort litigation, concluding that utilitarian and corrective justice goals will be best met by replacing the specific causation requirement with general causation and proportional recovery. Finally, Part IV discusses the procedural ramifications of such a substantive reform, proposing a novel private-public hybrid recovery system: by combining a qui tam-like trigger with expert administrative adjudication, the specific causation requirement's shortcomings can be efficiently and effectively mitigated.

Indeed, the hybrid agency solution suggested by this Article represents a novel approach to the classical dilemma of how, broadly speaking, to resolve mass torts. Specifically, this Article's proposal of coupling a private law trigger to a public adjudicatory system is not only well suited for the challenges created by the specific causation requirement, but, due to its facility with managing expert adjudication and flexible administrated recoveries, it also has the potential to capture the best<sup>14</sup> and guard against the worst<sup>15</sup> features of both private law and public law adjudicatory systems.

#### I. SPECIFIC CAUSATION AND SCIENTIFIC PROOF

In order to recover in tort, a plaintiff must show that *this* defendant caused *this* plaintiff's injury.<sup>16</sup> This is known as the specific causation requirement.<sup>17</sup> Proving only that the defendant's malfeasance can cause injuries of the sort experienced by the plaintiff—"general causation"—is not

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S. Pardo, *The Paradoxes of Legal Proof: A Critical Guide*, 99 B.U. L. REV. 233, 253–87 (2019), these problems with the specific causation requirement result from science's practical limitations. Thus, although it is exceedingly unlikely that this problem will be resolved for a very long time, it is at least theoretically possible that advances in science could eventually render this concern obsolete.

14. For examples of the important role that privately incentivized plaintiffs' lawyers play in investigating mass torts, see generally Deborah R. Hensler, *Revisiting the Monster: New Myths and Realities of Class Action and Other Large Scale Litigation*, 11 DUKE J. COMP. & INT'L L. 179 (2001), and of the crucial expertise that can be assembled in an administrative resolution scheme, see generally Carl N. Pickerill, *Specialized Adjudication in an Administrative Forum: Bridging the Gap Between Public and Private Law*, 82 NOTRE DAME L. REV. 1605 (2007).

15. For example, the agency-cost concerns endemic to mass torts, see John C. Coffee, Jr., *Class Wars: The Dilemma of the Mass Tort Class Action*, 95 COLUM. L. REV. 1343, 1349 (1995), administrative capture, see generally Matthew C. Stephenson, *Public Regulation of Private Enforcement: The Case for Expanding the Role of Administrative Agencies*, 91 VA. L. REV. 93 (2005), and the immense systemic drain of large contingency fees.

16. 4 FOWLER V. HARPER ET AL., THE LAW OF TORTS § 20.2 (2d ed. 1986); WILLIAM L. PROSSER, HANDBOOK OF THE LAW OF TORTS § 41, at 237 (4th ed. 1971).

17. See HARPER ET AL., *supra* note 16, § 20.2; PROSSER, *supra* note 16, § 41, at 237; Michael D. Green et al., *Reference Guide on Epidemiology*, in REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 549, 551, 627 (3d ed. 2011).

enough.<sup>18</sup> For example, a heart attack patient suing a drug manufacturer who shows only that the drug can cause heart attacks has proven general causation.<sup>19</sup> To recover, the plaintiff will need to prove that the manufacturer's drug and not something else caused *her* heart attack—specific causation. In theory, medical forensics would ideally provide such proof. In practice, though, proving specific causation generally entails assembling a string of inferences and hoping for the best: showing that a plaintiff was exposed to the drug, that she was not exposed to other harmful substances likely to have caused the heart attack, that she was not predisposed to have a heart attack regardless of her drug exposure, and so forth.<sup>20</sup>

Specific causation consists of two prongs: (A) determining *what* caused the plaintiff's injury—"pathogenesis"—and (B) determining *who* is responsible for the harmful substance or pathogenic mechanism—"responsibility."<sup>21</sup> Plaintiffs must prove both specific pathogenesis and specific responsibility to recover. Yet, science has not advanced to a point where it can regularly supply proof of either, let alone both, in the mass tort context.<sup>22</sup> This is the root of specific causation's problems. And, as this Article's discussion illustrates, the gulf between the law's requirements and science's capabilities has led to substantial horizontal inequity in mass torts, as some judges and juries have chosen to side with apparent justice even when that means ignoring the legal requirement of specific causation, while others adhere strictly to the formal requirements of the law even when doing so results in injustice.

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18. Green et al., *supra* note 17, at 551, 623.

19. McClain v. Metabolife Int'l, Inc., 401 F.3d 1233, 1242 (11th Cir. 2005).

20. *Id.* at 1243; *see also infra* Section I.A.2. For additional discussion of tort law's causation requirements, *see, for example, In re Breast Implant Litig.*, 11 F. Supp. 2d 1217, 1224 (D. Colo. 1998); *In re "Agent Orange" Prod. Liab. Litig.*, 611 F. Supp. 1223, 1238 (E.D.N.Y. 1985) (explaining that specific causation may be proven by proving general causation and excluding other possible causes for plaintiff's illness); M. Neil Browne et al., *The Epistemological Role of Expert Witnesses and Toxic Torts*, 36 AM. BUS. L.J. 1 *passim* (1998) (discussing the causation requirement and expert testimony).

21. This particular framing of the specific causation requirement is one of this Article's original contributions.

22. There are rare exceptions to this. For example, thalidomide, a sedative, is "one of the most potent human teratogens ever discovered," causing "[m]any babies [to be] born with severe . . . deformities after Thalidomide exposure." Joseph Sanders, *From Science to Evidence: The Testimony on Causation in the Bendectin Cases*, 46 STAN. L. REV. 1, 21 n.94 (1993); *see also* Max Sherman & Steven Strauss, *Thalidomide: A Twenty-Five Year Perspective*, 41 FOOD DRUG COSM. L.J. 458, 459 (1986); Helen B. Taussig, *A Study of the German Outbreak of Phocomelia*, 17 OBSTETRICAL & GYNECOLOGICAL SURV. 840, 840-44 (1962).

## A. THE SCIENCE OF PATHOGENESIS

## 1. The Difficulty with Causation

Biological proof is the primary means by which a plaintiff can prove specific pathogenesis in the medical context.<sup>23</sup> Biological proof looks to the mechanism of injury: how the agent produces its alleged effect.<sup>24</sup> It is a rare plaintiff who can prove that *this* substance more likely than not caused *this plaintiff's* injury without establishing how exactly the substance interacted with her body.<sup>25</sup> For instance, proving merely that asbestos is associated with lung disease generally will assure few asbestos plaintiffs of recovery: many substances are associated with lung disease. It is the knowledge of asbestos' unique mechanism of disease-causation that ensures a plaintiff recovery: an asbestos plaintiff may point to lodged asbestos fibers and telltale pulmonary scarring as evidence of her disease's etiology.<sup>26</sup> Therefore, with few exceptions, only those plaintiffs who experience an injury unique to their exposure—such as mesothelioma<sup>27</sup>—will succeed in proving specific causation absent evidence of the mechanism of injury.

Because of the complexity of the human body, however, science often cannot explain the mechanism by which something causes an illness. Cancer, autism, and multiple sclerosis are all widely studied but poorly understood

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23. *E.g.*, Sanders, *supra* note 22, at 13 (discussing the ways in which causation may be proven). In rare instances, statistics, which look to the strength of the correlation between exposure and injury, may provide proof of specific pathogenesis. "A plaintiff can prove specific causation by a preponderance of the evidence by providing epidemiological evidence that indicates a relative risk greater than 2.0; that is, the people exposed to the substance suffer injuries more than twice as frequently as those not exposed." *Id.* at 16.

24. *Id.* at 13 (noting that establishing a biological theory requires "analyses of the chemical and physical attributes of the agent and on the agent's effect on animal and human subjects"). For example, a heart attack may be caused by a blockage of a coronary artery, which was facilitated by substantial preexisting cholesterol plaque in that artery, which grew due to the patient's high level of blood cholesterol, and which, in turn, is influenced by diet, genetics, and lifestyle choices such as smoking. Elliott M. Antman & Eugene Braunwald, *Acute Myocardial Infarction*, in HARRISON'S PRINCIPLES OF INTERNAL MEDICINE 1352, 1352–53 (Anthony S. Fauci et al. eds., 14th ed. 1998).

25. For a broader discussion of the causation requirement in tort law, see PROSSER AND KEETON ON THE LAW OF TORTS § 38, at 248–49 (W. Page Keeton ed., 5th ed. 1984) (noting the preponderance requirement).

26. See Tee L. Guidotti et al., *Diagnosis and Initial Management of Nonmalignant Diseases Related to Asbestos*, 170 AM. J. RESPIRATORY & CRITICAL CARE MED. 691, 696–97 (2004), <http://ajrccm.atsjournals.org/content/170/6/691.long> [<https://perma.cc/J7X9-MZPV>] (describing common signs of asbestos-caused lung disease).

27. Mesothelioma is one lung disease caused almost exclusively by asbestos exposure. Marie-Claude Jaurand & Jocelyne Fleury-Feith, *Pathogenesis of Malignant Pleural Mesothelioma*, 10 RESPIROLOGY 2, 2–8 (2005); *What Causes Malignant Mesothelioma?*, AM. CANCER SOC'Y, <https://www.cancer.org/cancer/malignant-mesothelioma/causes-risks-prevention/what-causes.html> [<https://perma.cc/V626-8XL2>].

diseases, and there are many agents that are suspected to cause harm by mechanisms that remain undiscovered.<sup>28</sup> When novel risk factors are involved, as is typically the case in mass torts, it may take decades before scientists understand a substance's mechanism of injury on even the most basic level.<sup>29</sup> Yet plaintiffs are routinely forced to assert what scientists cannot: not merely that the substance can cause the injury, but how.

This is what the breast implant plaintiffs attempted. Plaintiffs invited testimony from experts who argued that leaking silicone from implants stimulated an auto-immune reaction leading eventually to connective tissue disease.<sup>30</sup> However, support for this theory was limited to some evidence that guinea pigs exposed to silicone-serum complexes—but not silicone itself—developed antibodies in reaction to their exposure; a far cry from proving a rodent, let alone a human, mechanism of causation. Because the plaintiffs needed to prove the mechanism of their injury to meet the specific causation requirement, they were forced to take the scientifically dubious approach of assuming that a link existed before seeking to explain the specific mechanism of that link.<sup>31</sup>

Silicone breast implants have subsequently been shown to have an adverse effect on the human body, albeit a different effect by a different mechanism than what breast implant plaintiffs asserted (injuring a somewhat different subpopulation of women).<sup>32</sup> At the time of the breast implant litigation, however, none of this was known. Breast implant plaintiffs suffered from a little-understood ailment—connective tissue disease—and believed, correctly it so happens, that silicone breast implants were not as harmless as their manufacturers claimed. Had the pathogenesis requirement

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28. See, e.g., *Cancer Controversies*, CANCER RES. U.K., <http://info.cancerresearchuk.org/healthy-living/cancercontroversies> [<https://perma.cc/E8H8-5HZP>].

29. For this reason, the vast majority of contemporary mass exposure torts involve substances that are suspected, but not known, to be the cause of injury. See, e.g., David A. Hyman, *Tobacco Litigation's Third-Wave: Has Justice Gone Up in Smoke?*, 2 J. HEALTH CARE L. & POL'Y 34, 39 n.25 (1998) (detailing mass exposure torts with only weak evidence of correlation).

30. MARCIA ANGELL, *SCIENCE ON TRIAL: THE CLASH OF MEDICAL EVIDENCE AND THE LAW IN THE BREAST IMPLANT CASE* 105–07, 120 (1996).

31. E.g., *id.* at 111–32. Statistically, there was little evidence of any such link. *Id.* at 108–10 (“The British Department of Health in 1994 issued a thorough review of all the published studies of the immunologic effects of breast implants, and pronounced most of the world ‘disappointingly poor.’” (citation omitted)).

32. See CTR. FOR DEVICES & RADIOLOGICAL HEALTH, U.S. FOOD & DRUG ADMIN, *ANAPLASTIC LARGE CELL LYMPHOMA (ALCL) IN WOMEN WITH BREAST IMPLANTS: PRELIMINARY FDA FINDINGS AND ANALYSES 5* (2011) (describing scientifically supported implant-caused illnesses, albeit by a different mechanism than what the breast implant plaintiffs claimed in trial); see also Grady, *supra* note 3 (reporting on recent findings that both saline and silicone breast implants increase the risk of anaplastic large-cell lymphoma—a rare disease impacting only a very few recipients of breast implants).

been strictly applied in the breast implant litigation, no plaintiff would have recovered because no proof of specific pathogenesis existed.<sup>33</sup> That would have been fair for breast implant manufacturers. But a firm adherence to the pathogenesis requirement will also proscribe recovery in the vast majority of legitimate mass torts, including for virtually any substance that leads to an increased risk of cancer.<sup>34</sup>

## 2. The Benefits of Correlation

Science may often fall short of explaining the biological mechanism of causation, but it excels at discerning when a risk factor is *associated* with an increased risk of a particular ailment—albeit rarely in a manner that proves specific causation by a preponderance of the evidence. We can thank modern statistics and our fast-growing population for this ability: by observing sufficiently large groups of people, scientists can draw statistically meaningful conclusions regarding what patterns do and do not emerge.<sup>35</sup> This practice is known as epidemiology. In one of the earliest known epidemiological investigations, a local physician suspected that drinking water was a source of infection for a mid-nineteenth century London cholera outbreak and plotted the distribution of cholera cases onto a map showing the city's water pumps. This map revealed that a substantial number of choleric households clustered around one particular pump that the doctor believed to be a possible source of the outbreak. After ruling out several other potential sources of cholera in the area, the doctor removed the handle of the pump in question and stopped the cholera outbreak.<sup>36</sup>

In modern epidemiological studies, the disease incidence in a population exposed to the studied risk factor is compared with the incidence in an otherwise similar population that has not been exposed.<sup>37</sup> To ensure

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33. And, this would likely have led to just results; over a decade later, no reliable evidence links silicone breast implants to connective tissue disease.

34. See, e.g., *Cancer Controversies*, *supra* note 28 (noting the general lack of scientific evidence of pathogenesis for cancers).

35. See 3 DAVID L. FAIGMAN ET AL., *MODERN SCIENTIFIC EVIDENCE* § 23:4 (2012–2013 ed. 2012) (discussing use and non-use of epidemiology in the courtroom).

36. U.S. DEP'T OF HEALTH & HUMAN SERVS., *PRINCIPLES OF EPIDEMIOLOGY IN PUBLIC HEALTH PRACTICE 1-7 to -9* (3d ed. 2006), <https://www.cdc.gov/csels/dsepd/ss1978/SS1978.pdf> [<https://perma.cc/MLX3-DJQ9>].

37. See ANGELL, *supra* note 30, at 97–100. Increasingly, epidemiologists now also rely on computational models, which are computer simulations that incorporate evidence (and assumptions) from a wide variety of sources, to predict risk in progressively more complex circumstances. See, e.g., Madhave V. Marathe & Naren Ramakrishnan, *Recent Advances in Computational Epidemiology*, 28 *IEEE INTELLIGENT SYSTEMS* 96, 96–100 (2013). Computational models are most useful where traditional epidemiological methods fall short, and they can also be used to reconcile seemingly contradictory results or provide more refined estimates of harm than what would be possible through a single study of a real

that any observed differences are due to the risk factor, researchers attempt to account for all other variables that may influence the disease incidences in the populations—age, gender, race, income, and so forth—to ensure that any difference in the two populations’ health outcomes is due to the risk factor rather than something else.<sup>38</sup> Thus, a significantly higher incidence of disease in the exposed population supports the inference that the risk factor causes the disease. Epidemiology is scientists’ primary tool for supporting the inference of causation where the underlying mechanism of injury is unknown.<sup>39</sup>

In some instances, these correlative inferences may be sufficient to meet tort law’s burden of proof for specific causation. For example, if 0.5 percent of the general population experiences a particular injury, but 50 percent of those exposed to a risk factor experience the injury, a court could plausibly find, on this evidence alone, that it is more likely than not that a given exposed plaintiff’s disease was caused by the risk factor; for those exposed to the risk factor, 99 percent (49.5 out of 50) were likely made ill by the risk factor.<sup>40</sup>

For the most part, however, a statistically significant degree of correlation will be only sufficient to indicate *general* causation: that a defendant’s substance caused some people injury.<sup>41</sup> This is not enough for

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system. *E.g.*, Kim J. Boström et al., *A Computational Model Unifies Apparently Contradictory Findings Concerning Phantom Pain*, 4 SCL REP., June 16, 2014, at 1, 1. This Article’s discussion of epidemiology and its ultimate proposal are not wedded to any one particular method of population analysis. *See, e.g., infra* note 122 (describing several relevant differences between computational models and more traditional epidemiological techniques and explaining why any increased reliance on computational modeling weighs more, rather than less, strongly in favor of the proposed reform).

38. *See* ANGELL, *supra* note 30, at 97–100. A well-designed epidemiological study will take into account many other possible risk factors. For example, women who receive breast implants may also be more likely to smoke. A higher cancer incidence in these women may therefore be due to the higher rate of smoking among this population rather than the breast implants. *Id.*

39. As previously discussed, correlative evidence must be strong to provide statistical proof of causation for any given plaintiff. *See* Steve C. Gold, *Causation in Toxic Torts: Burdens of Proof, Standards of Persuasion, and Statistical Evidence*, 96 YALE L.J. 376, 376–80 (1986) (discussing statistical proof of causation in detail).

40. For a similar calculation of causation probability, see Sanders, *supra* note 22, at 16 n.62. *Contra* James Robins & Sander Greenland, *The Probability of Causation Under a Stochastic Model for Individual Risk*, 45 BIOMETRICS 1125, 1126 (1989) (concluding that this practice could not be mathematically supported: “the probability of causation is nonidentifiable”).

41. For example, an epidemiological study may reveal an illness rate of 12 percent for those exposed to a risk factor, but a rate of only 7 percent for those who are not exposed. This supports the inference that, of those exposed to the risk factor, 7 percent would have become sick regardless, but 5 percent likely had their illness “caused” by the risk factor. Despite the fact that such a study indicates a 71 percent increase in risk associated with the factor (from 7 percent to 12 percent)—which is unacceptably high, see Paul R. Hunter & Lorna Fewtrell, *Acceptable Risk*, in WATER QUALITY 207–25 (Lorna Fewtrell & Jamie Bartram eds., 2001)—no individual plaintiff will be able to rely on these

tort law; a plaintiff must not merely prove that the defendant's substance could have caused her illness, but that it most likely did.<sup>42</sup>

### B. THE SCIENCE OF RESPONSIBILITY

The second prong of the specific causation requirement, responsibility, is no less of a challenge in the mass tort context than pathogenesis. Mass tort plaintiffs have typically been exposed to multiple similar or identical risk factors created by multiple potential defendants. A plaintiff may not sue just any producer of the harmful agent in question; common law permits recovery only once the plaintiff identifies who specifically was responsible for her injury.<sup>43</sup> In some instances, the plaintiff's exposure may have been sufficiently limited such that one particular manufacturer may be identified and named as the defendant. Often in mass torts, however, plaintiffs will be unable to single out just one manufacturer.<sup>44</sup>

In these instances, the plaintiff faces two choices. The plaintiff may name multiple defendants and hope for some form of market share or enterprise liability.<sup>45</sup> Or the plaintiff can narrow the field to the most likely manufacturer and name only that defendant. The former strategy carries a substantial risk of non-recovery, as few courts recognize theories of shared recovery and naming multiple defendants in this situation can be portrayed as an implicit concession that the plaintiff has only weak proof of specific responsibility.<sup>46</sup> On the other hand, plaintiffs pursuing the latter course risk suing the wrong party, something that may become apparent only after substantial resources have been devoted to the case.

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results entirely to prove that she was injured by a preponderance of the evidence. In fact, it is *less* likely than not (five-twelfths or 42 percent probable) that any specific plaintiff exposed to this risk factor was injured as a result of her exposure.

General causation may be proven in far more minuscule percentages than this (for example, epidemiological studies may indicate, with 99 percent confidence, that exposure to a certain agent increases the risk of heart disease in a certain population from 40 percent to 41 percent).

42. *E.g.*, Green et al., *supra* note 17, at 551; Sanders, *supra* note 22, at 14 ("Under traditional tort theory, a plaintiff must prevail by a preponderance of the evidence on both [specific and general causation] to succeed."); *see also infra* Part III (discussing epidemiology in more detail).

43. *See, e.g.*, Allen Rostron, *Beyond Market Share Liability: A Theory of Proportional Share Liability for Nonfungible Products*, 52 UCLA L. REV. 151, 151 (2004) (noting that market share liability, enterprise liability, and other theories that permit recovery without the identification of one specific responsible party have been "severely restricted" by courts and exploring potential applications of similar theories of liability).

44. *See*, for example, the DES litigation where plaintiffs could not distinguish one manufacturer's DES from another's.

45. *See* *Sindell v. Abbott Labs.*, 607 P.2d 924, 937 (Cal. 1980) (pioneering market share liability).

46. Naming as few as two defendants implies a lack of confidence as to the culpable party. Even those plaintiffs who can cite to other factors that support specific responsibility will face an uphill battle when they name five, ten, or more defendants—as is often the case in mass torts.

Most problematically, even when a plaintiff correctly identifies the responsible party, it may be difficult to establish the requisite proof of responsibility in court.<sup>47</sup> Distribution chains and expense reports may not definitively reveal the culpable party or parties, forcing plaintiffs to turn to forensics to prove that the injurious substance originated from some specific defendant(s) in situations where there is a significant delay between exposure and onset of injury or where it is not clear which of many manufacturers of a fungible product is liable. Unfortunately, this is a proof that regularly falls outside of science's current capabilities. Injuries may bear telltale signs of their origin—asbestosis, for example, is more than merely an undifferentiated respiratory illness<sup>48</sup>—but rarely are those signs so specific as to indicate which particular manufacturer's product was responsible for the injury. Instead, it is common in the mass tort context for competing manufactures' products to not only be practically indistinguishable but also be chemically identical. Such was the case in the DES litigation, where one manufacturer's synthetic estrogen was no different from any other's.<sup>49</sup>

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The challenges associated with proving pathogenesis and responsibility compound: a plaintiff unable to conclusively demonstrate that one particular substance was the source of her injury will also struggle to prove that liability against a manufacturer of the substance is appropriate. Moreover, even when a plaintiff can meet the burdens of proof for specific pathogenesis and specific responsibility individually, the aggregated uncertainty may cause the plaintiff to fall short of proving specific causation; a jury may find that it is probable that the substance causes the plaintiff's injury (60 percent) and probable that the injurious substance was produced by the defendant (60 percent), but yet improbable that the defendant was responsible for the plaintiff's injury (60 percent multiplied by 60 percent equals 36 percent). Finally, courts treat the interaction between specific pathogenesis and specific responsibility in an inconsistent manner: where one court may separate these questions and find causation where it is more likely than not that the substance causes the plaintiff's injury, and where it is more likely than not that the defendant was responsible for that injury, others, as above, hold that the *combined* probability of causation must exceed 50 percent for

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47. E.g., *Sindell*, 607 P.2d at 929–30.

48. Asbestosis is uniquely characterized by pleural plaques and the recovery of asbestos bodies. Guidotti et al., *supra* note 26, at 692.

49. See Paul D. Rheingold, *Women, Health, and Law: Litigation Involving DES*, 1 WOMEN HEALTH, no. 5, 1975, at 26, 26–27.

a plaintiff to recover.<sup>50</sup>

### C. THE NESCIENCE OF MASS TORT LITIGATION

The challenge of proving specific causation, pathogenesis in particular, should have been too great for the breast implant plaintiffs.<sup>51</sup> There is no accepted scientific theory that explains how silicone breast implants might cause connective tissue disease and epidemiological studies have not supported more than a slight inference of even general causation.<sup>52</sup> Although plaintiffs' lawyers such as John O'Quinn found experts who would speculate on the mechanisms by which silicone might cause illness, the breast implant plaintiffs' general litigation strategy shied away from addressing the issue of specific causation.<sup>53</sup> Rather, plaintiffs' lawyers repeatedly drew jurors' attention to the manufacturers' failure to sufficiently test the safety of implants and to the severity of their clients' injuries.<sup>54</sup> Again and again, teary-eyed plaintiffs took the stand, leading one appellate judge to comment that "[e]ach of these women was at risk of encountering the same fate from which [the plaintiff] suffered"—"a painful and debilitating disease."<sup>55</sup> This strategy worked; plaintiffs repeatedly were awarded large sums by outraged jurors. In fact, jurors interviewed in one breast implant case in which a plaintiff was awarded \$1.5 million openly admitted they had no idea whether the implants had made the women sick.<sup>56</sup> Unable to find specific causation, given the scientific uncertainty surrounding breast implants and connective tissue disease, jurors responded by blatantly ignoring this required element of tort law.<sup>57</sup>

50. This problem is described in more detail in Michael Pardo's article. *See* Pardo, *supra* note 13, at 266–82.

51. Identifying which defendants were responsible was not a concern in this context. Because most plaintiffs only received one set of implants from a single implant manufacturer, it was generally clear which manufacturer was responsible for the implant that purportedly caused each plaintiff's injury. The cooperation between silicone providers and implant manufacturers made this even less of a problem; because many breast implant manufacturers were silicone-implant partnerships, it was generally clear who was responsible for what parts of the implants. *Compare* ANGELL, *supra* note 30, at 39 (describing few proof-of-responsibility issues in the breast implant context), *with* Rheingold, *supra* note 49.

52. Grady, *supra* note 3 ("A woman is more likely to be struck by lightning than get this condition." (quoting a statement from Allergan, a company that makes implants)).

53. ANGELL *supra* note 30, at 111–32. Moreover, O'Quinn and others have been criticized for putting "experts" on the stand with spurious theories for the purpose of confusing and overwhelming juries. *See, e.g., id.* at 118.

54. *See id.* at 111–32.

55. *Id.* at 124 (quoting Judge Proctor Hug).

56. David E. Bernstein, *The Breast Implant Fiasco*, 87 CALIF. L. REV. 457, 497 (1999) (book review).

57. *Id.* It also may be that, given the choice between making an overwhelmingly complicated scientific judgment and ruling in favor of an (apparently) seriously wronged plaintiff, juries chose the latter path. *See, e.g.,* Valerie P. Hans, *Judges, Juries, and Scientific Evidence*, 16 J.L. & POL'Y 19, 20

John O'Quinn was not the first, nor will he be the last, to attempt to subvert the specific causation requirement by taking advantage of procedural shortcomings in the tort system's consideration of challenging scientific questions.<sup>58</sup> Given the frequent impossibility of proving specific causation in the mass tort context, plaintiffs' regular embrace of a strategy of nescience is not surprising.<sup>59</sup> Nor is its success. Mass tort juries, tasked to mete out justice in a system appearing to permit little, fall for this all too often.<sup>60</sup> The complexity of the science underlying specific causation and responsibility can serve as a license for jurors to rule according to their intuition of what is just, rather than what is scientifically supported. Even when defense experts conclusively demonstrate, say, that there is no scientific way to link the asbestos fibers recovered from an asbestosis plaintiff's lungs to the defendant manufacturer, jurors may nevertheless award judgment against the generally—but not specifically—culpable asbestos manufacturer, discussions of pleural thickening and carbon tracing be damned.<sup>61</sup>

Although judges well-versed in science, or especially vigilant, may effectively check such misjudgments through summary judgment, directed verdicts, or *judgments non obstante veredicto*, jury decisions are more often than not upheld.<sup>62</sup> Judges, like jurors, also may be won over by the appearance of a morally superior resolution, even absent the requisite proof of specific causation. Given the scientific obstacles that prevent plaintiffs

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(2007); see also Sanders, note 22, at 9, 12.

58. See, for example, the substantial body of scholarship critical of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), and its progeny. One particularly worrisome development in this area is firms' attempts—some successful—to gain admittance of *proposed* expert testimony. *E.g.*, *Mass. Mut. Life Ins. v. Residential Funding Co.*, 989 F. Supp. 2d 165, 169–70, 176 (D. Mass. 2013); *Nat'l Credit Union Admin. Bd. v. RBS Sec., Inc.*, No. 11-2340-JWL, 2014 U.S. Dist. LEXIS 59893, at \*6–9 (D. Kan. Apr. 30, 2014) (granting a motion in limine for an expert who had proposed a sampling plan but had not yet performed the analysis).

59. Although he does not connect this problem with the specific causation requirement, Wex Malone famously detailed parallel strains of realism running throughout the tort system. John C. P. Goldberg & Benjamin C. Zipursky, *Concern for Cause: A Comment on the Twerski-Sebok Plan for Administering Negligent Marketing Claims Against Gun Manufacturers*, 32 CONN. L. REV. 1411, 1411–12 (2000).

60. Although few of these cases ultimately proceed to trial, the few that do exert an enormous effect on the settlements reached in the remainder.

61. In the asbestos context, cases often involve substantial discussion of the asbestos products to which plaintiffs had been exposed. Because asbestosis appears to be a cumulative injury, plaintiffs able to show their continued contact with a number of defendants' asbestos, and no other asbestos, could establish the requisite degree of specific responsibility, even without scientific evidence of their asbestosis' pathogenesis. This sort of proof can be sufficient to meet the legal requirements of specific responsibility. When only one or several manufacturers of the asbestos that plaintiff encountered were joined, however, this indirect method of proving responsibility loses effectiveness. In the context of other non-cumulative diseases, exact pathogenesis might be required.

62. *E.g.*, Lynne Liberato & Kent Rutter, *Reasons for Reversal in the Texas Courts of Appeals*, 44 S. TEX. L. REV. 431, 440 (2003) (finding a jury reversal rate of approximately 25 percent in Texas). *Daubert* hearings can also be an effective tool for judges seeking to prevent juries from being misled.

from meeting their burden of proof, it is difficult to fault judges or juries, who typically are novices when it comes to science, for seeking what appears to be a just result even in the absence of these proofs. Rather than viewing the procedural defect of runaway judges and juries as the primary problem, we should consider these rogue justice-givers as a symptom of a far greater predicament: the requirements of specific causation are inconsistent with science's capabilities.<sup>63</sup>

## II. IS THIS A PROBLEM?

Just how big of a problem does this present? In some sense, the tort system appears to be self-regulating: because the specific causation requirement is unfair for mass tort plaintiffs, juries simply ignore it when awarding judgments—and punish those who are irresponsible, even if that irresponsibility may not have led to the injury in question. Not all decisionmakers, however, are so disinclined to follow the letter of the law; plaintiffs have repeatedly been denied judgment solely on the basis of failing to meet the specific causation requirement.<sup>64</sup> This disconnect between law and science has therefore furthered horizontal inequity, especially in the context of mass torts. As a consequence, neither corrective justice nor utilitarian goals—widely viewed as the competing primary justifications for tort law—are being met in this context.

### A. CORRECTIVE JUSTICE AND THE SPECIFIC CAUSATION REQUIREMENT

The specific causation requirement impedes, in practice, corrective justice in the context of mass torts. In the corrective justice view, the tort system serves a primarily moral function: to right wrongs perpetrated against plaintiffs by defendants.<sup>65</sup> The very concept of liability itself supports this normative relationship, and the court—“justice ensouled”<sup>66</sup>—ensures that there is a connection between the injury and the remedy.<sup>67</sup> In addition to rights-protection, corrective justice seeks to promote values of fairness and coherence.<sup>68</sup> Additionally, most corrective justice theorists assign some value to deterrence; the tort system should not merely correct past wrongs

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63. Although this was not the case in the breast implant litigation, the cost of the specific causation requirement's limitations is likely disproportionately borne by mass tort victims.

64. *E.g.*, Felicity Barringer, *Exposed to Solvent, Worker Faces Hurdles*, N.Y. TIMES, Jan. 25, 2009, at A16 (describing the legal difficulties facing plaintiffs with Parkinson's disease who had strong evidence of general causation but not specific causation in Trichloroethylene litigation).

65. *E.g.*, Ernest J. Weinrib, *Corrective Justice*, 77 IOWA L. REV. 403, 409 (1992).

66. RONNA BURGER, ARISTOTLE'S DIALOGUE WITH SOCRATES ON THE NICOMACHEAN ETHICS 253 n.46 (2008) (quoting Aristotle).

67. Weinrib, *supra* note 65, at 410.

68. *Id.* at 404, 416–17.

but should seek to prevent future wrongs.<sup>69</sup>

As Ernest Weinrib,<sup>70</sup> Jules Coleman,<sup>71</sup> and others have recognized, the specific causation requirement serves a corrective justice function in theory: it safeguards the link between culpable defendants and wronged plaintiffs. Pathogenesis ensures that plaintiffs who have not been wronged do not recover and responsibility prevents defendants from being punished for the wrongs of others. In practice, however, the specific causation requirement has the effect of substantially reducing corrective justice whenever statistical proof of causation is necessary. Tasked with asserting an impossible-to-meet legal standard, courts are transformed from arbiters of justice to enforcers of the status quo. So long as wronged plaintiffs cannot meet the specific causation requirement, culpable defendants legally should—and often do—escape liability.

Moreover, a tort system that provides no means of recovery for most of an entire class of injured plaintiffs is neither fair nor coherent.<sup>72</sup> The specific causation requirement forces many plaintiffs to choose between deception and non-recovery, even when they are otherwise morally deserving of recovery. Such a system recognizes the validity of some plaintiffs' injuries and the culpability of some defendants with one hand (as general causation may often be satisfied) while formally denying the possibility of any recovery with the other (because specific causation cannot).<sup>73</sup> In practice, corrective justice is often only a possibility for those mass tort plaintiffs who are able to hijack the justice system, leading to substantial horizontal inequity.<sup>74</sup> And similarly situated plaintiffs are treated differently as courts that side with mass tort plaintiffs often overcompensate those plaintiffs, seeking to adequately punish the defendants who they perceive as largely escaping culpability.<sup>75</sup> This also leads to inconsistent deterrence: defendants

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69. *Id.* at 409 n.24; e.g., Gary T. Schwartz, *Mixed Theories of Tort Law: Affirming Both Deterrence and Corrective Justice*, 75 TEX. L. REV. 1801, 1801 (1997); Ernest J. Weinrib, *Deterrence and Corrective Justice*, 50 UCLA L. REV. 621, 623 (2002).

70. Weinrib, *supra* note 65, at 418.

71. Jules L. Coleman, *Risks and Wrongs*, 15 HARV. J.L. & PUB. POL'Y 637, 645 (1992).

72. This Article's introduction illustrates the additional incoherence introduced by background risk's role in statistical proof of causation. A plaintiff injured by a substance that increases her injury risk from 1 percent to 3 percent will achieve recovery (because it is more likely than not—67 percent probability—that her injury was caused by the substance) while a plaintiff injured by a substance that increases her injury risk from 30 percent to 50 percent will not (because it is less likely than not—40 percent probability—that her injury was caused by the substance). For reasons unrelated to the strength of the statistical study or even to the substance's harmfulness, only one plaintiff will recover.

73. Cf. Christopher H. Schroeder, *Corrective Justice and Liability for Increasing Risks*, 37 UCLA L. REV. 439, 465–69, 473–78 (1990) (objecting to the moral luck inherent in the tort system on Kantian grounds).

74. This could lead to race- and gender-based systemic disparities in recoveries as the "attractiveness" of a plaintiff becomes more important relative to more neutral questions of causation.

75. Barbara J. Rothstein et al., *A Model Mass Tort: The PPA Experience*, 54 DRAKE L. REV. 621,

cannot properly price the cost of their malfeasance in the face of an unpredictable judicial system. Designed to promote corrective justice, the specific causation requirement instead stands firmly in the way of the ideology's principal aims in the mass tort context.<sup>76</sup>

#### B. UTILITARIANISM AND THE SPECIFIC CAUSATION REQUIREMENT

Specific causation also interferes with the tort system's fulfillment of utilitarian goals.<sup>77</sup> Utilitarianism seeks to maximize the utility of society as a whole.<sup>78</sup> The utilitarian theory of torts posits that the purpose of the tort system is to optimally deter future injuries; the threat of tort recovery should deter rational economic actors from pursuing harmful practices.<sup>79</sup> Although this deterrence could be achieved through a purely administrative system, optimal deterrence is best accomplished in a world in which the government lacks perfect information by leaving risk assessment to the market: economically rational actors will implement safety measures justified by the risk and cost of an injury.<sup>80</sup> Additionally, because litigation expenses are not utility-enhancing, the utilitarian conception of tort law values systemic efficiency in addition to optimal deterrence. Finally, utilitarian theories of tort law generally do not abandon notions of defendant culpability and plaintiff remuneration entirely; so long as sub-optimal conduct is efficiently deterred, society is best served by transferring wealth from culpable defendants to make injured plaintiffs whole. Similarly, utilitarianism recognizes that loss is best born by large corporate defendants, which can

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622 (2006).

76. Cf. Donald G. Gifford & Christopher J. Robinette, *Apportioning Liability in Maryland Tort Cases: Time to End Contributory Negligence and Joint and Several Liability*, 73 MD. L. REV. 701, 726–27 (2014) (describing an analogous situation that arose over fifty years ago in the context of contributory negligence, concluding, similarly, that “[t]he doctrine of contributory negligence as a total bar to recovery, considered harsh and unfair by many juries, undermines the rule of equal justice under law as well as respect for the rule of law” (footnote omitted)).

77. Utilitarianism is but one of a number of theories focused in one way or another on maximizing the overall happiness, wealth, utility, et cetera of society. E.g., Louis Kaplow & Steven Shavell, *Fairness Versus Welfare*, 114 HARV. L. REV. 961, 988 (2001); Richard A. Posner, *Utilitarianism, Economics, and Legal Theory*, 8 J. LEGAL STUD. 103, 104–05 (1979) (distinguishing between classical utilitarianism and wealth maximization, while advocating for the latter).

78. Utilitarians commonly express utility in economic terms. This is not to say that utility includes only purely economic benefits and loss. Rather, a predominant belief among utilitarians is that an economic value may be assigned even “non-economic” costs such as pain and suffering. See, e.g., Kaplow & Shavell, *supra* note 77, at 992 n.61; Posner, *supra* note 77, at 104.

79. Guido Calabresi, *The New Economic Analysis of Law: Scholarship, Sophistry, or Self-Indulgence?*, 68 PROC. BRITISH ACAD. 85, 97–99 (1981); Kaplow & Shavell, *supra* note 77, at 1098. Put in a purely economic parlance, the utilitarian conceives that torts are a means of internalizing negative externalities. The utilitarian approach to tort law is often referred to as the “instrumental” approach. ROBERT SAMUEL SUMMERS, *INSTRUMENTALISM AND AMERICAN LEGAL THEORY passim* (1982).

80. When society desires above-economic rational safety measures, administrative regulation presents an attractive approach: elected legislatures rather than the free market would then outline society's over-deterrence priorities.

efficiently redistribute that loss.

The specific causation requirement directly undercuts utilitarian goals by removing mass tort resolution from the market's hands, leading to sub-optimal deterrence. Because few mass tort plaintiffs can meet the requirement, litigation is rarely a viable option for recovery. Manufacturers, who would place more emphasis on testing or safety were they responsible for the costs of their carelessness, instead disregard avoidance measures in favor of marginally increased profits. Losses that would be best borne by manufacturers are passed along to private citizens.

Moreover, mass tort plaintiffs who successfully recover typically do so by avoiding the specific causation requirement, leading to haphazard and unpredictable patterns of recovery. Neither the most deserving nor the most injured plaintiffs will necessarily recover, nor will the most culpable defendants regularly face liability.<sup>81</sup> As a result, accurate liability assessment has become virtually impossible in much of the mass tort context, leading to non-optimal levels of deterrence. One other consequence of this unpredictability is that it encourages trials rather than far more efficient settlements; agreeing on a settlement amount is more challenging when the potential judgment ranges from nothing whatsoever to an unprecedentedly large windfall.<sup>82</sup>

Finally, because the specific causation requirement encourages plaintiffs to shift the court's attention away from specific causation and toward other issues, via performative causation, it can increase expert witness costs: plaintiffs will put experts on the stand, not merely to establish causation, but also to testify on whatever other issues to which the plaintiffs hope to divert the jury's attention. Defendants, in turn, will be forced to respond to these new brummagem theories with experts of their own.

No differently than with corrective justice, the specific causation requirement directly impedes the utilitarian goals of the tort system.

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81. "Deserving" and "culpable" are used here to refer to respective strengths of the case in question, and not to the underlying moral claims.

82. When considering whether to settle, defendants and plaintiffs each evaluate the probability and likely amount of judgment: the present case value. Settlements are reached when the lower end of defendant's case value range corresponds with the upper end of plaintiffs' case value range. John Bronsteen, *Some Thoughts About the Economics of Settlement*, 78 *FORDHAM L. REV.* 1129, 1137 (2009). The greater the variability in award amounts, the less incentive either party has to settle; a defendant who believes that a non-judgment is likely may only be willing to settle for a minimal sum, while a plaintiff who sees a possibility of an enormous award may not settle for anything less than a generous amount.

### III. SUBSTANTIVE RESOLUTIONS OF THE SPECIFIC CAUSATION REQUIREMENT

Thus, in the mass tort context, neither corrective justice nor utilitarian ends are well served by the current iteration of the specific causation requirement. As this Part discusses, there are two promising substantive directions for addressing these problems: reforming general causation and reforming specific causation. Because, however, only the latter approach will avoid further encouraging performative causation, it represents the preferable option. This Part proposes, specifically, replacing the specific causation requirement with epidemiology-based proportional damages; instead of tying all-or-nothing recovery to each individual plaintiff's satisfaction of the preponderance requirement, plaintiffs should be permitted to recover in proportion to the likelihood that their injury was caused by the agent in question. Part IV of the Article concludes by addressing the procedural consequences of such a reform, and by proposing a novel system for proportional recovery.

#### A. REFORMING THE GENERAL CAUSATION REQUIREMENT

Several scholars have proposed reforming general causation in the mass tort context, albeit in response to different challenges. Although reforming general causation would substantively resolve problems with the specific causation requirement,<sup>83</sup> it would further encourage performative causation, prompting spurious mass tort lawsuit and subverting the compensatory goals of the tort system in the process. Neither corrective justice nor utilitarian goals would be furthered by such a reform.

In *Eliminating General Causation: Notes Towards a New Theory of Justice and Toxic Torts*, the late Margaret Berger explored the current judicial standards' inadequate deterrence of toxic torts.<sup>84</sup> Because a plaintiff will face great difficulty establishing general causation for a product about which little is known, the general causation requirement creates a perverse incentive for corporations "not to know and not to disclose" the possible risks of their products.<sup>85</sup> Berger suggests that liability should therefore spring from defendants' development and disclosure of the information necessary to assess serious latent risks, essentially creating a rebuttable presumption of causation: a defendant who negligently develops or discloses information on its product's risks must prove that the plaintiff's "adverse health reactions

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83. Eliminating the general causation requirement would also relieve plaintiffs from proving specific causation.

84. Margaret A. Berger, *Eliminating General Causation: Notes Towards a New Theory of Justice and Toxic Torts*, 97 COLUM. L. REV. 2117, 2119 (1997).

85. *Id.*

could not plausibly arise from exposure to defendant's product," or "reduce damages by proof that a particular plaintiff's injury is attributable . . . to another cause."<sup>86</sup>

Wendy Wagner and Heidi Li Feldman, in two separate articles, have similarly suggested that the burden of proof should shift in the mass tort context.<sup>87</sup> First, like Berger, Wagner focuses on the products testing conducted by the defendant. The burden of proof should be reversed, according to Wagner, in instances when a defendant negligently failed to test a potentially dangerous substance sufficiently before exposing a significant number of people to that product.<sup>88</sup> So long as a plaintiff shows that her exposure to the product was foreseeable and that the defendant did not adequately test the safety of that product, a plaintiff need only prove that "it is not biologically implausible that exposure to the product caused plaintiff's harm" to shift the burden of proof to the defendant.<sup>89</sup> The defendant would then bear the burden of rebutting the presumption of causation. This reform, Wagner suggests, not only would encourage manufacturers to thoroughly research the safety of their products, but it would also do so without deviating significantly from common law tort requirements.<sup>90</sup>

Even more radically, Feldman suggests that "whenever the plaintiff could establish strong uncertainty about general causation," the burden of proof on causation would shift in the toxic tort context.<sup>91</sup> This shift would provide a powerful incentive for manufacturers to investigate the negative effects of their substances before widely distributing them.<sup>92</sup> By changing the burden of proof in these situations, Wagner and Feldman's proposals would discourage defendants from releasing products that had not been proven sufficiently safe or, at the very least, exhaustively tested.<sup>93</sup>

86. *Id.* at 2144–45.

87. *Cf. Liriano v. Hobart Corp.*, 170 F.3d 264, 271 (2d Cir. 1999) (Calabresi, J.) (holding that once the defendant violated a standard of care designed to protect the class of people that included the plaintiffs, the burden of persuasion on causation shifted to the defendant); *Martin v. Herzog*, 126 N.E. 814, 820 (1920) (Cardozo, J.) (same).

88. Wendy E. Wagner, *Choosing Ignorance in the Manufacture of Toxic Products*, 82 CORNELL L. REV. 773, 834 (1997).

89. *Id.* at 835 n.230.

90. *Id.* at 839–40.

91. Heidi Li Feldman, *Science and Uncertainty in Mass Exposure Litigation*, 74 TEX. L. REV. 1, 45 (1995); see also Ariel Porat & Alex Stein, *Liability for Uncertainty: Making Evidential Damage Actionable*, 18 CARDOZO L. REV. 1891, 1892 (1997) (applying game theory in concluding that the "risk of non-persuasion" should be shifted to "promote both efficiency and fairness").

92. Feldman, *supra* note 91, at 45 (suggesting, alternatively, awarding half damages whenever the plaintiff established "strong uncertainty about causation, and the defendant could not eliminate it").

93. One of the indignities of the current system is that it places the burden on plaintiffs of proving something to which defendants have superior access. The resulting incentive for defendants to "choose ignorance," discussed by Berger, Wagner, and Feldman, is a separate policy problem from that described in this Article—although it can contribute to the specific causation requirement's challenges by robbing

However, Berger, Wagner, and Feldman's proposals do not actually resolve the specific causation's incompatibility with scientific proof but instead shift its cost from plaintiffs to defendants. Defendants, undoubtedly, can do more to ensure the safety of the products that they introduce to the market; the specific causation requirement's limitations likely cut toward sub-optimal deterrence. So, to the extent that these proposals incentivize responsible corporate behavior, they represent a step in the right direction. But the scientific barriers that inhibit plaintiffs from proving causation will similarly prevent defendants from disproving it. And where a prospective defendant fails to meet its testing requirement or where there is uncertainty about general causation (as there often will be), these proposals will provide a boon to plaintiffs. Moreover, any additional testing resulting from these proposals is unlikely to take the form of the rigorous, but expensive, epidemiological research that might reveal possible latent defects: defendants will likely implement testing procedures sufficient to meet their testing burden but insufficient to discern possible additional risks.

Instead, the greatest impact of reforming general causation will be on the amount of litigation brought by plaintiffs. Relieving plaintiffs from proving a principal tortious element, causation, will lend viability to countless specious lawsuits. This is problematic viewed under either a corrective justice or utilitarian lens. Juries, often innately suspicious of corporate greed, will have little difficulty finding some evidence of corporate negligence, even when none exists; in the hindsight following a mass tort, the failure to take any corporate action that could have forestalled disaster will look like negligence. Thus, almost every person who sustains an injury of uncertain cause will have a viable tort claim against any one of the many manufacturers of products with which she regularly interacts. Even those plaintiffs who have suffered no wrong will recover, and the deterrence value of tort suits will be distorted.

This is essentially what happened in the breast implant litigation. The extreme scientific uncertainty surrounding the health effects of breast implants was used to great effect by plaintiffs' lawyers to shift the question from causation—both specific and general—to defendants' negligence and plaintiffs' injuries. Plaintiffs able to show these latter two elements, even in the absence of any strong proof of causation, were often able to recover large

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those few plaintiffs who might have been able to prove a pathogenic mechanism of the evidence necessary for that proof. Nevertheless, because this Article's proposed reform assigns recovery based on data that is not exclusively controlled by prospective defendants—epidemiology generally relies on publicly available population-level evidence, see *infra* Section III.B, it will also mitigate the "choosing ignorance" problem.

verdicts.<sup>94</sup> The burden of proof had effectively shifted. Decades of epidemiological research, however, now indicate that it is unlikely that more than a handful of these plaintiffs were actually injured by their implants.<sup>95</sup> Moreover, there is no indication that Berger, Feldman, or Wagner's goal of pre-market safety research was accomplished. Breast implant safety appears to be no more of a concern for manufacturers today than before the lawsuits: one need only look to the recent European scandal involving the use of industrial rather than medical-grade silicone in breast implants to see the continuingly cavalier attitude of implant manufacturers toward their customers' health.<sup>96</sup> Rather, implant litigation has left, strewn in its wake, bankrupt defendants, unjustly enriched plaintiffs and plaintiffs' lawyers, and a lingering hysteria about the use of silicone in medical devices.<sup>97</sup>

The breast implant litigation is far from unique as an example of lawsuits gone awry and jurors run amok.<sup>98</sup> The combination of prejudiced media coverage, politics, public outrage, and financial incentives will regularly encourage attorneys and their clients to pursue claims with little scientific basis.<sup>99</sup> The general causation requirement is often the only barrier standing between a hysterical public and socially-costly litigation. Removing this barrier will only increase the frequency of spurious cases, thus imposing a substantial burden on society by way of a strained judicial system, a decreased confidence in science, and a host of recoveries and settlements where the plaintiff's injury has not been caused by the defendant's negligence. Although the benefits of a relaxed general causation requirement may be great, so too would the costs.

#### B. REFORMING THE SPECIFIC CAUSATION REQUIREMENT

Instead, corrective justice and utilitarian aims will be best served by reforms to the specific causation requirement.

This is the conclusion reached by David Rosenberg in *The Causal Connection in Mass Exposure Cases: A "Public Law" Vision of the Tort*

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94. ANGELL, *supra* note 30, at 122–23.

95. Grady, *supra* note 3.

96. See *France Breast Implant Scandal Spurs Criminal Complaint*, CBS NEWS (Dec. 27, 2011 3:48 PM), [http://www.cbsnews.com/8301-504763\\_162-57348842-10391704/france-breast-implant-scandal-spurs-criminal-complaint](http://www.cbsnews.com/8301-504763_162-57348842-10391704/france-breast-implant-scandal-spurs-criminal-complaint) [<https://perma.cc/VBR7-2SWW>].

97. This final consequence may well be the most serious; silicone is a crucial element in numerous medical devices, but the breast implant litigations have driven many of the leading manufacturers out of the silicone medical device market. *E.g.*, ANGELL, *supra* note 30, at 31–32.

98. See generally PHANTOM RISK: SCIENTIFIC INFERENCE AND THE LAW (Kenneth R. Foster et al. eds., 1993) (detailing numerous other such cases).

99. *Id.* at 32–36.

*System*.<sup>100</sup> In his influential article, Rosenberg proposed, for somewhat different reasons than those suggested in this Article, that the specific causation requirement in mass torts should be replaced by class-action based proportional recovery: otherwise, “a claim’s deterrence value is . . . a ‘public good’ that the private claims market fails to maximize because plaintiff attorneys gain nothing from its production.”<sup>101</sup>

The basic substantive contours of this insight remain largely applicable—although, as Part IV discusses, a different procedural vehicle for proportional recovery is now needed. As this Section will describe, despite the numerous scientific advances in the decades since mass torts first emerged as a societal problem, there remains a large and seemingly insurmountable gulf between the needs of the tort system and the tools offered by science. The requirements of the law should reflect the strengths and weaknesses of science’s current capabilities.<sup>102</sup>

### 1. Epidemiology’s Capabilities and Limitations

First, what are those capabilities? In most instances, epidemiology represents science’s gold standard for proving general causation. Epidemiology will typically indicate whether some effect—any effect—is present via a measure of certainty known as a “p-value.”<sup>103</sup> Specifically, the p-value represents the likelihood that the observed effect is due to random chance rather than the hypothesized cause.<sup>104</sup> When the p-value is sufficiently low (indicating a low likelihood that the observed correlations are coincidental), the results are reported as “statistically significant.”<sup>105</sup> Statistical significance generally requires a p-value of less than 0.1 or 0.05, indicating a 90 or 95 percent likelihood, respectively, that the observed effect was not due to chance—far exceeding the greater than 50 percent preponderance standard used in civil law.<sup>106</sup>

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100. David Rosenberg, *The Causal Connection in Mass Exposure Cases: A “Public Law” Vision of the Tort System*, 97 HARV. L. REV. 849, 925 (1984) (proposing, however, that this would best be achieved by class actions); see also Saul Levmore, *Probabilistic Recoveries, Restitution, and Recurring Wrongs*, 19 J. LEGAL STUD. 691, 694 (1990) (arguing for probabilistic recovery in all circumstances to minimize error); cf. Glen O. Robinson, *Probabilistic Causation and Compensation for Tortious Risk*, 14 J. LEGAL STUD. 779, 783 (1985) (arguing for probabilistic recovery in the context of increase-in-risk claims).

101. Rosenberg, *supra* note 100, at 900–01.

102. See *supra* Parts I–II.

103. See *supra* Section I.A.2; U.S. DEP’T OF HEALTH & HUMAN SERVS., *supra* note 36, at 6-42.

104. U.S. DEP’T OF HEALTH & HUMAN SERVS., *supra* note 36, at 6-42.

105. *Id.* at 6-42 to -43.

106. *Id.* at 6-44. It is important to note that these numbers measure subtly different things. A study with a p-value of less than 0.05 could nevertheless fail to meet the preponderance burden if a factfinder determined that the study was unreliable for other reasons.

In addition to reporting whether some effect is present, modern epidemiology can also indicate the size of the observed effect.<sup>107</sup> This is reported as a “point estimate,” which is a number that represents the study’s best guess as to the magnitude of the observed effect.<sup>108</sup> Point estimates are typically reported together with a “confidence interval,” which denotes a possible range of effect sizes at a given level of precision.<sup>109</sup> So, for example, a study might report a point estimate (or best guess) of 6.2, with a 95 percent confidence interval of [5.5, 6.8], which indicates with 95 percent certainty that the true observed effect value falls somewhere between 5.5 and 6.8.<sup>110</sup>

Epidemiology can therefore indicate the likelihood that there is some non-random effect (represented by the “p-value”), the size of that causative effect (represented by the “point estimate”), and the precision of the estimate of the causative effect (represented by the “confidence interval”). Each of these pieces of information could be of immense value in determining if, and how much, an injured party is entitled to recover.

There are, however, a number of limitations that shape how epidemiology can be used. Most fundamentally, because epidemiology describes population-level effects, even well-conducted and carefully considered studies can be poorly suited for determining the specific cause of any given individual’s illness.<sup>111</sup> A study that reveals that 8 percent of the general population experiences a disease, but 10 percent of those exposed to the defendant’s product experiences that disease would support a finding that a substantial percentage of the plaintiff group—20 percent—experienced *but for* causation.<sup>112</sup> But such a study provides no guidance for determining *which* specific plaintiffs are entitled to recovery: the epidemiological evidence provides highly specific salient information about the group as a

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107. *Id.* at 4-56. Because statistical significance is influenced by the size of studied population and the size of the observed effect, effect size does not predetermine statistical significance. This is the source of a key misconception about epidemiological findings. *See, e.g.,* Melissa Moore Thompson, *Causal Inference in Epidemiology: Implications for Toxic Tort Litigation*, 71 N.C. L. REV. 247, 252 (1992) (“A large risk ratio signifies a strong association, which is highly indicative, although not determinative, of a causal relationship.”).

108. U.S. DEP’T OF HEALTH & HUMAN SERVS., *supra* note 36, at 4-56.

109. David H. Kaye & David A. Freedman, *Reference Guide on Statistics*, in REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 211, 243-46 (3d ed. 2011).

110. *Id.* Confidence intervals are generally reported at precisions, typically called “confidence levels,” of 68 percent, 95 percent, or 99.7 percent. *Id.* at 244. When zero, the value for no observed effect, is contained within a given confidence interval, the result is not statistically significant at that level of precision.

111. Specifically, epidemiology is best suited to identifying effects on larger groups. Epidemiology may not indicate whether, for example, thirty-seven-year-old males of Eastern European ancestry are adversely affected by their exposure to a substance that has seen only regional exposure. *See, e.g.,* Green et al., *supra* note 17, at 551.

112. Out of every ten people exposed to the disease, two appear to have been injured as a result of that exposure.

whole but says little about any given individual within the group. This is the crux of the specific causation requirement's shortcomings: the strongest tool available for determining causation in mass torts will, even when providing detailed information with a high degree of confidence, usually fall short of finding specific pathogenesis.

Moreover, epidemiology's provision of useful information—notably, the calculation of the p-value and the confidence interval—is dependent on large study populations.<sup>113</sup> Studies of small populations are less likely to reveal an effect, and even when such a study shows that *some* statistically significant effect is present, it may not be able to specify the extent of that effect (for example, whether the substance in question causes a 10 percent or 20 percent increase in the prevalence of the injury in question).<sup>114</sup> However, because mass torts typically involve hundreds, thousands, or even millions of injured potential plaintiffs, population size will not necessarily limit epidemiology's usefulness in this context. Nevertheless, any application of epidemiology should be designed both to maximize the size of the populations studied and to ensure as close of a relation between the population studied and the recovery group as possible. Private law solutions, which often restrict recovery to only those injuries that spring from a single defendant or occur in a single state, unnecessarily constrain study sizes, potentially undermining the reliability of the scientific evidence.<sup>115</sup>

Finally, epidemiological studies incorporate numerous assumptions about the data—that the effect has a specific size, that certain other causes may also contribute to that effect, that the effect may be generalized to other populations, and so forth—which present opportunities for bias or other validity problems to taint a study's findings.<sup>116</sup> The ultimate validity of any

113. Kaye & Freedman, *supra* note 109, at 243.

114. So, for example, one study on the impact of textured breast implants on a rare cancer observed a population of only *eleven* women with the cancer (because there were only eleven cases of this cancer in the Netherlands in seventeen years). Daphne de Jong et al., *Anaplastic Large-Cell Lymphoma in Women with Breast Implants*, 300 J. AM. MED. ASS'N 2030, 2030 (2008). Although the findings suggested that the breast implants increased women's risk of the cancer, the small sample size resulted in an unusably large confidence interval: the 95 percent confidence interval indicated that the textured breast implants in question increased the risk of the cancer by between 2.1 and 156.8 times. *Id.*

115. See *infra* Part IV. In such circumstances, either a larger study will have to be generalized to the sub-population in question, which may or may not respond in the same manner as the larger group, or studies of the smaller group in question could be conducted, which could lead to unacceptably large confidence intervals or even p-values that do not meet the threshold of statistical significance.

116. Some of these problems include confounding bias, selection bias, and information bias. For example, confounding bias occurs when two seemingly independent factors are statistically associated, which can lead "the effect [of one to] be confused with or distorted by the effect of the other." ROBERT W. FLETCHER & SUZANNE W. FLETCHER, *CLINICAL EPIDEMIOLOGY* 8 (4th ed. 2005). The Bendectin litigation presents a clear example of confounding bias: "there was no mechanism to control 'for age or for other drugs,'" meaning "[e]ither of these factors could have increased the rate of birth defects, thereby skewing [the] study results." Thompson, *supra* note 107, at 260 (footnote omitted). Selection bias

study depends on the accuracy of these assumptions, which often manifest in subtle or complicated ways.<sup>117</sup> Among other things, this means that a study may report statistically significant effects and narrow confidence intervals and yet fail to accurately reflect the truth of what is being observed. Thus, even seemingly valid studies can be misleading and put to misuse. For example, a second scientist studying the mid-nineteenth century London cholera outbreaks believed that cholera was spread by bad air and, therefore, that elevation was a principal factor in the outbreak (because he believed that the soil at low elevations contained more of the organic material that produced the supposed air contamination in question).<sup>118</sup> His epidemiological analysis was remarkably sophisticated for its time, considering, among other things, the possible role of water in the outbreak. But because of a poor assumption that he made—how he defined his water sources—his results led him to incorrectly conclude that elevation was indeed the prime factor in the outbreak: one subtly mistaken assumption tainted the results of what was otherwise a seemingly valid study.<sup>119</sup> Although there are now well-established standards for evaluating and using the results of epidemiological studies, there continue to be numerous ways in which epidemiology can mislead.<sup>120</sup>

Yet epidemiology's reliance on assumptions is not all bad. When incorporated correctly, assumptions in epidemiology enable researchers to test and control for a wide range of hypotheses, leading to highly refined statistical results that provide well-specified answers to questions that are

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describes problems with the selection of the study groups. Again, in the Bendectin litigation, "some patients were included as both Bendectin [patients] and controls." *Id.* (citation omitted) (alteration in original). Information bias arises when there are "errors in obtaining . . . needed information." *Id.* at 261 (citation omitted) (alteration in original). The Bendectin litigation provides a possible illustration of this, too: "[p]atients [who] were supposed to have used Bendectin . . . may not have in fact ingested it because there was nothing to record that they had ever been administered the drug." *Id.* (citation omitted) (alteration in original). These potential limitations are not unique to epidemiological research: validity and bias problems are pervasive throughout all scientific research.

117. For example, in the breast implant context, scientists posited that age, body mass index, smoking, and the use of post-menopausal hormones were each associated with the risk of connective-tissue diseases and therefore controlled for these risk factors in their statistical analysis. I-Min Lee et al., *Prospective Cohort Study of Breast Implants and the Risk of Connective-Tissue Diseases*, 40 INT'L J. EPIDEMIOLOGY 230, 232–38 (2011).

118. P. Bingham et al., *John Snow, William Farr and the 1849 Outbreak of Cholera that Affected London: A Reworking of the Data Highlighting the Importance of the Water Supply*, 118 PUB. HEALTH 387, 387–88 (2004).

119. Modern statistical analysis of Dr. Farr's results actually indicates a stronger association between water and cholera. *Id.* at 392. Nevertheless, Dr. Farr's well-reasoned, careful, but ultimately misleading study highlights the need to use care in employing the results of an epidemiological study.

120. See, e.g., *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 318 (7th Cir. 1996) (Posner, J.) ("[I]t is a daunting task for judges who do not have a scientific background (and most do not) to decide whether a scientist's testimony is real science or not."). These risks are only heightened when computational models are used. See *infra* note 122.

otherwise difficult to address. As a result, epidemiology is most helpful in the increasingly common circumstance in which a disease outbreak is complicated—like, in the context of breast implants, where it was not initially known which of many possible diseases (with multiple known and unknown causes) breast implants could cause. Epidemiology’s usefulness in yielding complicated information about a complicated reality is a strength well-matched for the challenges of the modern world. Thus, notwithstanding its limitations, epidemiology has grown to be one of scientists’ most powerful analytical and descriptive tools—and epidemiology is often scientists’ only tool for ascertaining causation.

Given the complexity and subtlety—and importance—of the assumptions underlying epidemiology, epidemiological research should be evaluated by experts.<sup>121</sup> As the breast implant litigation and other mass torts have shown, the challenge of weighing the strength and validity of epidemiological studies is regularly too great for private law adjudicators. Because judges and juries typically have little post-secondary scientific training and do not possess the scientific fluency to accurately evaluate when a study is well designed or what it does and does not imply about a particular population, they are susceptible to bad science and emotional manipulation.<sup>122</sup> This risk is heightened in the context of epidemiology, where unremarkable but inaccurate assumptions can undermine a study’s otherwise valid results.<sup>123</sup> Allowing expert scientists, rather than lay judges or juries, to evaluate and apply evidence provided by epidemiological research will diminish the risk of recoveries based on infirm or misleading epidemiological studies.

## 2. Epidemiology and Pathogenesis

Together, epidemiology’s fundamental strengths and limitations point to several substantive conclusions (as well as several procedural considerations, which will be discussed in Part IV). First and foremost, an epidemiology-based replacement for the specific causation requirement should not treat recovery as a question with only two possible answers, complete recovery or complete non-recovery. Epidemiological studies can indicate not merely that the substance could have caused the illness, but also the probability that it did. This advantage of epidemiological research is

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121. See *infra* Part IV.

122. See, e.g., Hans, *supra* note 57, at 19–46.

123. Because the assumptions that go into designing a computational model are often both complicated and non-obvious, increased reliance on computational models by lay judges and juries is likely to result in an even greater misuse of science in the courtroom.

squandered by the contemporary tort system when causation is viewed as an all-or-nothing proposition.

But what would it look like to substantively tailor recovery to epidemiology? Epidemiology-based recovery could start with establishing a statistically significant modicum of general causation.<sup>124</sup> Once it has been established that a plaintiff was exposed to a product that *can* cause the injury in question, the plaintiff's recovery could be based on the probability that her injury was caused by exposure and not something else, as determined by an expert reviewer.<sup>125</sup> For example, take a group of one hundred plaintiffs where each plaintiff experienced an illness incurring an average of \$10,000 in medical costs. When, as described above, an epidemiological study indicates that 20 percent of injuries to exposed parties were caused by the defendant, a typical plaintiff would recover 20 percent of her total damage, or \$2,000 (20 percent multiplied by \$10,000).<sup>126</sup> Each plaintiff's recovery could then be reduced or increased by a showing of other exogenous risk factors that influence the likelihood that the injury was caused by defendants.<sup>127</sup>

A defendant's liability could be similarly calculated. Ideally, a defendant's total liability should reflect the harm caused by that defendant. This, too, can be calculated using epidemiology. In the above example, the total injury experienced by exposed parties would be \$1 million (100 plaintiffs multiplied by \$10,000). Where, continuing in the above example, epidemiology indicates that the defendant is responsible for 20 percent of this injury, the defendant should be liable for 20 percent of the total damage, or \$200,000 (20 percent multiplied by \$1 million).<sup>128</sup>

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124. In other words, the operative question is the degree of certainty about *some* effect, rather than the effect size. Whether a relative risk of 1.1 or 2.1 is observed, general causation will be established when a well-conducted study observes a statistically significant effect. This is consistent with the test for general causation used by courts reviewing such evidence today. *See, e.g., In re Lipitor (Atorvastatin Calcium) Mktg., Sales Practices & Prod. Liab. Litig.*, 150 F. Supp. 3d 644, 649 (D.S.C. 2015); *Henricksen v. Conoco Phillips Co.*, 605 F. Supp. 2d 1142, 1158 (E.D. Wash. 2009). For more on statistical significance, see *infra* Section IV.A.

125. This is similar to Mark Geistfeld's "evidential grouping" proposal. Mark A. Geistfeld, *The Doctrinal Unity of Alternative Liability and Market-Share Liability*, 155 U. PA. L. REV. 447, 469 (2006).

126. *Cf.* Steve C. Gold, *When Certainty Dissolves into Probability: A Legal Vision of Toxic Causation for the Post-Genomic Era*, 70 WASH. & LEE L. REV. 237, 281–82 (2013) [hereinafter Gold, *When Certainty Dissolves into Probability*] (arguing, somewhat analogously, for damage apportionment in toxic torts based on increase-in-risk contributions); Gold, *supra* note 39, at 393–401 (advocating for the substantial factor test over but for causation in the toxic torts context while arguing, similarly, that liability should be discounted based on uncertainty).

127. Proportional recovery such as this has been used in the class action context by Judge Weinstein. This also bears some similarity to recovery in medical malpractices cases for loss of chance. *See, e.g., Matsuyama v. Birnbaum*, 890 N.E.2d 819, 828–36 (Mass. 2008).

128. Insurance funds or damage scheduling could be approximated using similar tools. Rosenberg, *supra* note 100, at 916–24.

Such a system satisfies both corrective justice and utilitarian ideals of the tort system.

At first glance, this solution may not appear to be fully adequate from a corrective justice perspective. For the most part, plaintiffs' injuries either will be caused by the defendant or they will not be; either the defendant's substance was the but for cause of the illness or something else was. Proportional recovery provides a plaintiff who would have experienced the injury regardless of her exposure with some recovery, while providing a plaintiff whose injury was caused by the defendant with only a partial recovery. This seems overly generous and yet inadequate.

The reality of science's limitations, however, restricts the availability of superior alternatives. For plaintiffs, in circumstances in which it is impossible to distinguish between injuries that are only apparently caused by the defendant and injuries that are actually caused by the defendant, what is the more just outcome: inconsistently disbursing recovery to some, but not all, plaintiffs without regard to proof of specific causation—the status quo—or providing plaintiffs with recovery proportional to the probability that their injury was caused by a defendant?<sup>129</sup> This latter route essentially assigns plaintiffs the moral right to the probability that they were wronged; a plaintiff whose cancer was 10 percent likely due to the defendant's misconduct has a moral right to recovery proportional to that probability, and no more. In a world in which it is impossible to determine which plaintiff was actually injured by the defendant, how can any individual stake a moral claim to full recovery in lieu of others? Would it be fair to award a plaintiff who we are 90 percent confident was *not* injured by the defendant more than a fraction of a full recovery? And would it be fair for a defendant, who almost certainly caused injuries to 10 percent of exposed parties, to escape liability altogether? Proportional recovery assigns a defendant liability for the exact amount of injury that the defendant caused—a morally attractive option; culpability is determined by the total amount of harm for which the defendant was responsible. Such an outcome is both fair and coherent.<sup>130</sup>

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129. A third alternative would be to provide full recovery to all plaintiffs. This runs into conceptual problems, however, when determining whether only injured plaintiffs can recover. If plaintiffs' moral claim to recovery springs from their exposure, non-injured plaintiffs can stake as powerful a claim as injured plaintiffs; the wrong, after all, is the potentially harmful exposure and not the resulting—or not—injury. This would leave manufacturers open to such sweeping liability that, even were it preferable from some corrective justice stance, it is untenable from a utilitarian perspective.

130. At the very least, the proposal yields fairer and more coherent outcomes than the status quo. To use just one example, southwest residents located downwind of Nevada bomb test fallout experienced increased rates of leukemia but could not prove that the radiation was the *but for* cause of their leukemia: prohibiting recovery for all such plaintiffs, as the status quo does, is far from a triumph of corrective justice.

From a utilitarian perspective, proportional recovery is a much more unambiguously attractive option. The total liability imposed under the proposed system will reflect the actual amount of harm inflicted by defendants and, therefore, it will fully internalize the effects of the mass injury. Defendants, the most efficient redistributors of loss, bear the brunt of the harm. What unrecovered injury loss remains is spread evenly across all plaintiffs and is not haphazardly borne only by litigants with less talented, or less lucky, lawyers. Plaintiffs, in turn, see their individual recoveries adjusted by their exogenous risk factors and thus are individually optimally deterred from undertaking risky activities; plaintiffs engaging in numerous risky practices who happen to also be exposed to a harmful substance do not reap a windfall for their exposure (which may well not be the cause of their resulting illness).<sup>131</sup>

### 3. Market Share Liability and Specific Responsibility

This proportional approach also represents an attractive solution to the proof problems associated with the responsibility prong of the specific causation requirement. One version of proportional liability particularly well-suited to mass injuries is market share liability, in which liability is apportioned among companies according to their respective shares of the market.<sup>132</sup> The specific formula of apportionment, however, is not crucial so long as defendants are held liable in proportions that reflect the likelihood that a given injury was caused by their particular product.

To ensure that no innocent party is held culpable, suit should be permitted against only those parties who could possibly be responsible—like, for example, defendants that produce an agent for which general causation is proven.<sup>133</sup> So long as a defendant may have injured a single plaintiff, however, that defendant could be held liable. Liability should then be adjusted upward or downward from a defendant's market share according to specific aggravating or mitigating factors, so that particularly reckless

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131. Proportional recovery presents an attractive mechanism for addressing other causation problems as well. *See, e.g.*, Pardo, *supra* note 13, at 237–38, 253–58 (discussing, among other things, the red-bus-blue-bus problem).

132. *Sindell v. Abbott Labs.*, 607 P.2d 924, 937 (1980); Rostron, *supra* note 43, at 151 (developing a working theory of proportional liability to “make a reasonable and fair allocation of liability among the defendants”).

133. Proportionality could also apply to general causation, with recoveries discounted by the extent to which general causation is unclear. But this Article proposes, instead, following science's lead and permitting recovery only when a linkage between the substance and the injury is proved to a statistically significant degree, 90 or 95 percent confidence. *See infra* Section IV.A; RONALD A. FISHER, *STATISTICAL METHODS FOR RESEARCH WORKERS* 80 (14th ed. 1970). Adopting statistics' higher degree of certainty for proportional recovery would lend credibility to the new system while substantially decreasing the possibility of non-deserving plaintiffs recovering.

defendants are responsible for more of the recovery than careful defendants.<sup>134</sup>

A modified form of market share liability could satisfy tort law's competing justifications. From a corrective justice perspective, modified market share liability coupled with epidemiology-based group recovery ensures that a defendant is only held liable for the amount of injury for which it is likely responsible.<sup>135</sup> Although a proportional recovery system assigns some amount of responsibility to defendants for the mere production of a potentially harmful product, regardless of whether that product in fact caused harm, truly innocent defendants will not be punished: when epidemiological studies show a product not to be harmful, parties will not be held responsible for damage allegedly flowing from that product.<sup>136</sup> Where there is no better way of determining individual liability than by using clues such as market share, modified market share grouped recovery is the preferable corrective justice reform.<sup>137</sup> Other attempts at determining culpability—such as a strictly enforced specific responsibility requirement—will either lead to severe under-apportionment of liability or, more likely, highly unpredictable recovery. Some culpable defendants may escape liability altogether while other defendants are required to bear the entire cost of the societal injury themselves. Modified market share liability establishes liability as accurately—and therefore as fairly—as is possible.<sup>138</sup>

Moreover, modified market share liability furthers utilitarian goals. Defendants collectively will be optimally deterred, as defendants' aggregated total liability will be accurately based on epidemiological

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134. Mitigating factors might include extra safety precautions imposed by the manufacturer, warning labels, or a concentrated distribution in areas with relatively few reported injuries. One aggravating factor could include a particularly virulent product composition, a relative lack of safety precautions, or distribution-based indications that one particular manufacturer's product was extraordinarily dangerous. Epidemiology could provide clues to many of these factors. *Cf.* Thomas *ex rel.* Grambling v. Mallett, 701 N.W.2d 523, 549–57 (Wis. 2005) (discussing and applying a similar risk contribution theory). Although, this proposal may be limited by the lack of strong epidemiological evidence distinguishing and quantifying the subtly distinct risk factors of different products.

135. There will be, however, rare circumstances in which manufacturers' market shares cannot be determined with a meaningful degree of accuracy. *See, e.g.*, Donald G. Gifford, *The Death of Causation: Mass Products Torts' Incomplete Incorporation of Social Welfare Principles*, 41 WAKE FOREST L. REV. 943, 985–87 (2006) (discussing lead exposure). In such cases, the expertise of the adjudicator in assessing relative levels of responsibility becomes even more important. *See id.*; *see also* Thomas, 701 N.W.2d at 560.

136. A liability system of this nature would incentivize pre-market investigation in a similar manner to the general causation requirement reforms discussed above.

137. *Cf.* Arthur Ripstein & Benjamin C. Zipursky, *Corrective Justice in an Age of Mass Torts*, in PHILOSOPHY AND THE LAW OF TORTS 214, 231–44 (Gerald J. Postema ed., 2001) (supporting market share liability under corrective justice theory in certain circumstances); Richard W. Wright, *Causation, Responsibility, Risk, Probability, Naked Statistics, and Proof: Pruning the Bramble Bush by Clarifying the Concepts*, 73 IOWA L. REV. 1001, 1073 (1988).

138. *E.g.*, Geistfeld, *supra* note 125, at 487.

adjustments to plaintiffs' injuries; defendants will be responsible for the proportion of societal harm that they collectively inflict. And defendants individually will be optimally deterred, as each defendant will be liable for the proportion of this total damage for which it is most likely responsible: a defendant that undertook few safety measures while widely distributing a dangerous substance in a vulnerable population will be responsible for a higher proportion of the damages than a defendant that took greater safety precautions or distributed less widely. Even if not perfect, individual deterrence will be as close to societally optimal as modern science permits.

Proving general causation and responsibility is regularly within reach for modern science. Rather than forcing injured plaintiffs to resort to jury deception in order to meet specific causation's often impossible standard, our system should be substantively modeled to embrace, via proportional recovery, what scientific tools are currently available.

#### IV. PROCEDURAL RESOLUTIONS OF THE SPECIFIC CAUSATION REQUIREMENT

Having laid out a substantive solution to the specific causation requirement's limitations, this Article concludes by analyzing the best procedural vehicle for reform. Class actions once presented an attractive option.<sup>139</sup> However, as this Part discusses, the unique challenges presented by epidemiology coupled with three decades of experimentation with creative private law structures suggest that class actions cannot and should not be used in such a manner, nor should multidistrict litigation ("MDLs"). Instead, the procedural resolution for specific causation's limitations should reflect the public nature of its principal cause, mass torts. Congress should create an administrative alternative to the private law for cases impacted by the specific causation requirement's shortcomings. Although an agency solution could take a number of different forms, this Article proposes that modeling this new path after *qui tam* litigation—and including a private-law component to administrative adjudication—will best ensure societal and individual fairness under both corrective justice and utilitarianism.

##### A. CRAFTING A HYBRID SOLUTION

Many of the procedural concerns raised or exacerbated by specific causation fall in areas in which the public administrative system is especially successful. Expertise, uniformity, and efficiency, in particular, are important considerations for successfully resolving specific causation using

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139. See Rosenberg, *supra* note 100, at 905–16.

epidemiology-based proportional recovery<sup>140</sup>—and are each hallmarks of a successful administrative system.

Moreover, the resolution of mass torts involves questions of a public nature.<sup>141</sup> Deterrence, in particular, is an important consideration under both corrective justice and utilitarian views of mass tort resolution. Thus, although many of the rights typically examined in the context of specific causation are private, the consequences of these adjudications implicate both private and public goods. Private attorneys, who, under the current system, are charged with prosecuting these cases, have no legal or ethical duty to the public as a whole; nor, of course, do defense attorneys. As a consequence, any resolution of mass torts within the private system will risk failing to sufficiently vindicate the important public goods at stake. This will not be as significant a problem if mass torts—and problems with specific causation in particular—are resolved administratively. Traditionally, the resolution of public rights, like those implicated by mass torts, has been left to the state and federal governments via administrative agencies.<sup>142</sup>

On the other hand, administrative enforcers have not always proven as zealous in pursuing possible violations as plaintiffs' attorneys: profit has proven to be a powerful motivator in spurring "private attorneys general" to investigate and develop cases.<sup>143</sup> An administrative law-private law hybrid system could capture the best of both worlds, providing a resolution to specific causation capable of addressing the concerns inherent to mass tort litigation.<sup>144</sup>

This Article proposes molding such a system after *qui tam* litigation, which provides a successful model for how private incentives can be used to promote the public good.

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140. See *supra* Section III.B.

141. E.g., Rosenberg, note 100, at 901.

142. Caleb Nelson, *Adjudication in the Political Branches*, 107 COLUM. L. REV. 559, 568–69 (2007); see also RICHARD A. NAGAREDA, *MASS TORTS IN A WORLD OF SETTLEMENT*, at viii (2007) ("The sheer numbers of [mass tort] claims, their geographic breadth, their reach across time to unidentified future claimants, and their factual patterns, together, demand the kind of systematized treatment characteristic of administrative processes.") (recognizing that the public nature of mass torts is not their only characteristic that calls for administrative resolution).

143. Hensler, *supra* note 14, at 182–84. There is an additional advantage borne out of the numerical advantage of private enforcers: "the citizenry[']s . . . millions of 'eyes on the ground' see far more than federal investigators ever could." Myriam E. Gilles, *Reinventing Structural Reform Litigation: Deputizing Private Citizens in the Enforcement of Civil Rights*, 100 COLUM. L. REV. 1384, 1429 (2000); see also John C. Coffee, Jr., *Rescuing the Private Attorney General: Why the Model of the Lawyer as Bounty Hunter is Not Working*, 42 MD. L. REV. 215, 220 (1983).

144. See Stephanie Bornstein, *Public-Private Co-Enforcement Litigation*, 104 MINN. L. REV. 811, 819–29 (2019) (providing a detailed theoretical description, and defense, of similar hybrid enforcement regimes); Stephen B. Burbank et al., *Private Enforcement*, 17 LEWIS & CLARK L. REV. 637, 687 (2013) (documenting existing federal statutory enforcement schemes with some "hybrid" characteristics).

### 1. The Qui Tam Model

The qui tam provisions of the False Claims Act (“FCA”) permit actions by the Attorney General or by private citizens known as “relators” to challenge fraud against the government.<sup>145</sup> Complaints filed by relators remain under seal for sixty days to give the government an opportunity to investigate the claim and, if it elects, proceed with the claim itself. When the government takes a case, it then is primarily responsible for prosecuting the case and is not bound by any act of the relator—although the relator continues as a party to the action and retains an interest, usually between 15 to 25 percent, in any eventual recovery plus attorney’s costs and fees. When the government elects not to proceed with the case, the relator may go forward and conduct the action herself (although the government retains the right to intervene at a later date). Successful relators, acting without government intervention, are generally entitled to between 25 to 30 percent of the proceeds plus attorney’s costs and fees.<sup>146</sup>

The modern qui tam provision of the FCA was crafted to address many of the same challenges that could arise in the context of an administrative solution to specific causation’s problems: to “supplement[] the public resources available for detecting and deterring public harms,” “lur[e] entrepreneurial attorneys into law enforcement’s battle against public harms, and neutraliz[e] the ‘capture’ of regulatory agencies by industry.”<sup>147</sup> And, as a growing body of research has shown, the FCA has been largely succeeding in accomplishing these goals.<sup>148</sup>

One crude but persuasive measure of qui tam’s success is the number of FCA cases filed and the amount of recovery secured. The FCA was amended in 1986 to, among other things, return qui tam citizen suits to economic viability. In the four decades prior to the amendment, six to ten qui tam cases were filed each year. In 1987, the first year in which the amendment took effect, thirty qui tam cases were filed. By 1997, over five hundred qui tam cases were being filed annually.<sup>149</sup> This filing boom has led to a boom in recovery for the U.S. government: from 1986 to 2009, FCA

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145. 31 U.S.C. § 3730(a)–(b) (2018).

146. *Id.* § 3730(d); *see also id.* § 3730(b) (noting also that the government may request an extension of this time).

147. Pamela H. Bucy, *Private Justice*, 76 S. CAL. L. REV. 1, 12 (2002) (noting, in addition, that the FCA also “seeks to elicit inside information about public harms”) (footnote omitted).

148. *E.g.*, David Freeman Engstrom, *Harnessing the Private Attorney General: Evidence from Qui Tam Litigation*, 112 COLUM. L. REV. 1244, 1318 (2012).

149. Ni Qian, Note, *Necessary Evils: How to Stop Worrying and Love Qui Tam*, 2013 COLUM. BUS. L. REV. 594, 608, 609; *see also* Brief of U.S. Senator Charles E. Grassley as Amicus Curiae Supporting Respondents, *Universal Health Servs. v. United States ex rel. Escobar*, 136 S. Ct. 1989 (2016) (No. 15-7).

actions returned \$28 billion to the U.S. treasury.<sup>150</sup> In fact, the qui tam provisions of the FCA have been so productive that most contemporary criticisms of qui tam litigation paint it as *too* successful, characterizing qui tam as “a ‘cottage industry,’ a ‘legal gold rush’ and a ‘great American giveaway.’”<sup>151</sup>

The striking success of the qui tam model is due in no small part to its built-in economic incentives. Qui tam cases are cheap to litigate, especially relative to mass torts. When the government elects to pursue a case, the costs to the private qui tam attorneys that filed the actions are relatively minimal. And even when private attorneys must foot the bill of the litigation, and not merely of the investigation, the questions presented in qui tam cases are relatively clear-cut, confining the scope of litigation and resulting in less overall uncertainty. As a consequence, although qui tam attorneys usually recover a far smaller percentage of the total than is otherwise standard in plaintiffs-side litigation—it is typical for qui tam attorneys to get only half of what is rewarded to the relator, or 7.5 to 15 percent of the total recovery—the lower cost of litigation and lower uncertainty makes qui tam litigation highly profitable for plaintiffs’ attorneys.<sup>152</sup> This has led to the rise of specialized relator-side firms (as well as a professional class of relators), which have realized “higher litigation success rates and surfac[ed] larger frauds compared to less experienced firms.”<sup>153</sup>

## 2. The Hybrid Solution

The successes of qui tam litigation could be replicated within an administrative resolution to specific causation. This proposal takes the following form: (1) private litigants barred from recovery by the specific causation requirement would file administrative claims for recovery, (2) triggering an administrative review of the epidemiological evidence and, if warranted, (3) epidemiology-based proportional recovery for all possible affected parties and market-based proportional liability against all possible responsible parties. Such a reform would represent a significant step toward resolving the procedural challenges raised both by the specific causation requirement and by the proposed substantive reform.

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150. Monica P. Navarro, *A Look at the Constitutional Implications of Retrospective Laws: The Case of the False Claims Act*, 28 T.M. COOLEY L. REV. 95, 101–02 (2011).

151. Engstrom, *supra* note 148, at 1247 (citation omitted).

152. *Id.* at 1269–85. According to some, qui tam litigation is *too* profitable for plaintiffs’ attorneys. Critics of qui tam litigation portray it as “a litigation regime run amok” in which “an undeserving alliance of ‘bounty-seeking’ and increasingly ‘professional’ relators and an ever more specialized qui tam plaintiffs’ bar” profit from this “great American giveaway.” *Id.* at 1247 (citation omitted).

153. *Id.* at 1249.

i. Filing a Claim

First, individual injured or exposed parties should be permitted to bring an administrative claim against individual, responsible parties in instances in which the specific causation requirement appears to bar recovery but where general causation can be proven by epidemiological evidence.<sup>154</sup> Essentially, this would create an epidemiology-based cause of action for potentially exposed plaintiffs to seek administrative recompense from those who could be responsible for their injury.<sup>155</sup>

Federal regulators should also be permitted to bring these claims and, like for claims brought under the FCA, to intervene in privately filed claims. Allowing government regulators to pursue some of these cases would decrease the recovery drain caused by contingency payments, especially in relatively straightforward cases. The result would likely mirror that of present-day FCA litigation, with the government allowing private firms to take the lead in circumstances in which the litigation appears particularly challenging or costly. As the FCA shows, parallel enforcement generally allows government regulators and private firms to excel in their respective areas of investigatory and litigation competency. Allowing federal regulators to intervene in privately-initiated cases would have the added benefit of diminishing the agency-cost risks that plague class action litigation: unscrupulous plaintiffs' attorneys could not so easily cash out at the expense of largely absent class members when government regulators have the power to continue a case with or without its lead attorneys.<sup>156</sup>

All filings would need to be detailed and particular about the nature and elements of their claim so as to prevent filing abuse. Just as in class actions, a plaintiff "with a largely groundless claim" could otherwise "take up the

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154. This recovery mechanism does not necessarily have to be exclusively available to mass tort victims: it could be made available to any plaintiff impacted by proof problems associated with the specific causation requirement.

155. "[A] potential benefit of private enforcement suits is that they can correct for agency slack—that is, the tendency of government regulators to underenforce certain statutory requirements because of political pressure, lobbying by regulated entities, or the laziness or self-interest of the regulators themselves." Stephenson, *supra* note 15, at 110 (footnotes omitted); *see also* SEAN FARHANG, THE LITIGATION STATE: PUBLIC REGULATION AND PRIVATE LAWSUITS IN THE U.S. 20 (2010) ("Lawsuits provide a form of auto-pilot enforcement that will be difficult for bureaucrats or future legislative coalitions to subvert, short of passing a new law."); *cf.* Michael Sant'Ambrogio & Adam S. Zimmerman, *Inside the Agency Class Action*, 126 YALE L.J. 1634, 1695 (2017) ("[A]gencies have generally avoided using aggregation to . . . deter[] misconduct . . .").

156. For more on these problems, *see supra* Section IV.C. It also may be advantageous to give government regulators the power to unilaterally dismiss a matter, even over the objections of the claim filer. Such a provision exists in the False Claims Act, 31 U.S.C. § 3730(c)(2)(A) (2018), although it is rarely used. This could serve as a mechanism for preventing rent-seeking plaintiffs from using the threat of large actions against defendants to obtain settlements. On the other hand, such a provision would diminish the effectiveness of the private right of action in combatting agency capture.

time of a number of other people, with the right to do so representing an *in terrorem* increment of the settlement value.<sup>157</sup> To prevent claimants from proceeding on claims based on suspicion alone, the administrative system could replicate private law screening mechanisms, like motions to dismiss and motions for summary judgment, to ensure that the agency's time is efficiently spent and that defendants are not victim to expensive fishing expeditions. This is particularly important because one side effect of the proposed system's maximization of the impact of each filed claim and minimization of litigation costs is to increase the incentive for speculative filings in pursuit of a windfall. On the other hand, the efficiency gains of resolving these claims administratively will somewhat mitigate the costs borne by defendants, thereby diminishing the *in terrorem* impact of claims. Moreover, the proposed system's reliance on expert decisionmakers and best scientific practices should function as a powerful systemic check on spurious filings: cases with little merit should be quickly disposed of by adjudicators with the competency to accurately evaluate each claim. Nevertheless, because it is impossible to know exactly how these considerations will interact, it will be necessary to carefully monitor filings within the newly created system to ensure that the respective interests of claimants, defendants, and the system as a whole are properly balanced.

As part of filing an administrative claim, plaintiffs could be required to concede that they cannot prove specific causation in the manner demanded by private law. Such a prerequisite would effectively force plaintiffs to choose between administrative recovery and private law recovery, thereby conserving judicial and administrative resources.<sup>158</sup> Even without this rule, however, an administrative system of this nature could exist in parallel with current private law causes of action.

Because the proposed hybrid system creates an administrative right to recovery for plaintiffs who cannot meet tort law's specific causation requirement, it does not displace any existing private law right to recovery. Preemption would therefore be neither necessary nor appropriate: plaintiffs should still be able to bring private law suits, potentially including mass tort suits, where it is possible to prove specific causation.<sup>159</sup> Nor, for that matter, would the Seventh Amendment—which prohibits the juryless adjudication

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157. *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 558 (2007) (citation omitted). *In terrorem* claims are legal threats made in the hopes of compelling settlements. *Id.*

158. It may not be necessary to force such a choice. Because the hybrid alternative provides a feasible path to recovery for plaintiffs who cannot prove specific causation, private law courts would face little pressure to craft recoveries for seemingly deserving plaintiffs with legally insufficient claims. And, as plaintiffs who cannot prove specific causation see their claims treated with growing disfavor by private law judges, they will increasingly file their claims exclusively in the administrative hybrid system.

159. *Cf. Bornstein*, *supra* note 144, at 819–29.

of suits for money damages that exist “at common law”<sup>160</sup>—present an obstacle to this proposal: the administrative right granted, the express right to recover without any proof of specific causation, is not a right recognized by the common law.<sup>161</sup>

ii. Administrative Review

Once a claim is filed, that claim would act as a trigger for specialized courts with administrative judges expert in epidemiological and statistical analysis to consider the available evidence.

The filing of one administrative claim should prompt as universal a review as possible. At its heart, this review would focus on the available epidemiological studies to determine how (or if) those studies apply and to whom they apply. The key question for adjudicators will be straightforward in theory but complicated in application: does epidemiology support proportional recovery and, if so, how should the liability be borne by various defendants according to their market share?

Such a review would begin by examining each study’s reported statistical significance: what is the likelihood that the observed effect is due to the hypothesized cause?<sup>162</sup> To reduce the risk of inaccurately assigning liability, it could be prudent to require general causation to be proven to a statistical certainty—a degree of proof far exceeding the preponderance of the evidence requirement applicable in the context of torts.<sup>163</sup> Such a high standard will substantially diminish fraud within the system without discouraging legitimate cases: few parties will successfully convince an expert adjudicator that their spurious theory or poorly designed study results in a 90 or 95 percent likelihood of causation; and yet, even the slightest causative impacts may be proven to a high degree of statistical certainty using epidemiology given the large sample sizes that characterize mass torts.<sup>164</sup> Trading the specific causation requirement for a far more searching general causation standard will thus make the investigation of injury more attractive without incentivizing speculative or spurious filings.

160. U.S. CONST. amend. VII.

161. *NLRB v. Jones & Laughlin Steel Corp.*, 301 U.S. 1, 48–49 (1937). Specific causation is an axiomatic requirement of personal injury torts. See Michael D. Axline, *The Limits of Statutory Law and the Wisdom of Common Law*, 38 ENVTL. L. REP. 10268, 10268 (2008) (“Statutory environmental law is often described as a response to the . . . common law[’s] . . . demands [for] proof of specific causation[.] . . . [S]tatutory regimes allow the government to regulate without proof of specific harm and causation.”).

162. See *supra* Section III.B (discussing statistical significance).

163. See *supra* Section III.B. Although this Article’s proposal is not conceptually wedded to any specific degree of statistical certainty, adopting a measure widely accepted in the relevant field—like 90 percent or 95 percent—would lend credibility to the proposed scheme. See FISHER, *supra* note 133, at 80.

164. See *supra* Section III.B.

But the agency's review of the epidemiological evidence cannot stop with the question of statistical significance: as the bad-air cholera study shows, a study may report statistically significant findings and yet be misleading.<sup>165</sup> The administrative experts should also review the numerous assumptions that go into a study's design to ensure that the study is both internally and externally valid—for example, that there are no alternative causes that explain the study's results and that the study's observed effects are reflective of those in the population for which the agency is considering recovery.<sup>166</sup> To this latter point, administrators should be given the discretion to craft as broad or as narrow a recovery as is appropriate based on the available evidence: where epidemiology indicates an effect on only a subset of a broader population, recovery should be limited to that smaller group. On the other hand, when the epidemiological evidence describes effects on the population as a whole, the recovery should not be restricted to claimants who reside in only one state. If necessary, the adjudicatory body would have the authority to complete additional investigation or even commission a new epidemiological study, although there should be a presumption in favor of considering the currently available evidence for the sake of judicial efficiency. Evaluating the studies' assumptions and tailoring the recovery to best match the epidemiological findings will be the tasks for which administrators' expertise will be most helpful.

The administrative court would also adjudicate whatever other questions and defenses arise, like negligence. There is no need to dispense with tort law's other requirements: the point of the administrative hybrid system is not to rewrite all of tort law. Instead, administrative recovery should function primarily as an alternative venue for cases that are not best resolved in private law because of the specific causation requirement's limitations. As a consequence, as a general rule, whatever legal requirements are applicable to the claims in question (besides causation)—such as duty, breach, and injury—should still apply. Where the underlying tort requires proof of negligence, for example, the reviewing adjudicator would determine whether each defendant was negligent.

There are substantial advantages to reviewing such claims administratively. Administrative agencies are well equipped to expertly adjudicate the challenging scientific questions that will accompany an epidemiology-based resolution of the specific causation requirement: from their inception, administrative agencies have been envisioned as “expert

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165. See *infra* Section IV.A.

166. “No scientific methodology for analyzing external validity exists . . . . External validity is a qualitative determination and is, therefore, ultimately a matter of informed judgement.” Thompson, *supra* note 107, at 262 (citation omitted) (internal quotation marks omitted).

disinterested regulatory regimes that could deal with [certain] issues . . . more effectively than Congress.”<sup>167</sup> Specialized adjudicators with specialized skill sets, one of the characteristic strengths of the public administrative system, will be able to effectively evaluate the rigor and reach of epidemiological evidence. Among other things, designating experts to consider the available scientific evidence will help mitigate the risk that epidemiology will be misinterpreted or that outlier studies will lead to too-big or too-small recoveries: experts will do a better job of distilling conclusions from the available evidence and experts will be better at knowing when to wait to render a conclusion.<sup>168</sup>

Moreover, administrative adjudication is well suited for ensuring uniformity. It will generally be easier to join all potential plaintiffs and defendants together through administrative adjudication of mass torts than through the private law: administrative agencies can be granted near-absolute power to transfer all like claims to a single adjudicatory body and evaluate those claims under a single theory.<sup>169</sup> Such a quasi-administrative solution to specific causation’s difficulties would be better able to universally implement market share or enterprise liability—and thus mitigate the challenges presented by the specific responsibility requirement without any resulting horizontal inequity.

Finally, administrative agencies are marked by their efficiency. In addition to the efficiency advantages gained from having experts evaluate challenging claims, and from grouping all impacted plaintiffs and defendants in a single adjudicatory action, agency adjudication tends to be faster, cheaper, and more accessible than ordinary courts.<sup>170</sup> The strengths of an administrative agency system—especially in the context of mass tort resolution—are well-matched to the needs created by specific causation.

A model for administrative review of torts already exists: the Federal Tort Claims Act (“FTCA”) assigns administrative courts to consider tort claims against the United States, which is “liable ‘in the same manner and to

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167. Pickerill, *supra* note 14, at 1628–29.

168. Expert adjudication alone, however, may not be sufficient to fully immunize disputes from this risk. It therefore could also be beneficial to design an administrative compensation scheme that allows for the reviewing agency to adjust compensation amounts upwards and downwards as additional studies are evaluated—perhaps providing recovery in annuity-like payments rather than via lump-sum awards. This sort of flexibility, too, is an advantage of handling these claims administratively rather than through the private law system.

169. Even when it is not possible for a single adjudicator to evaluate all claims, uniformity in administrative adjudication will almost certainly exceed that in state and federal courts. *See* Stephenson, *supra* note 15, at 114 (describing the efficiency and accountability advantages of administrative adjudication over private law).

170. H. W. R. WADE, ADMINISTRATIVE LAW 744 (5th ed. 1982).

the same extent as a private individual under like circumstances,”” albeit only for money damages.<sup>171</sup> FTCA administrative courts have largely proven themselves up to the task of adjudicating the fundamental elements of tort law—as well as resisting capture.<sup>172</sup> Although the factual and legal questions presented by mass torts tend to be particularly challenging, by creating adjudicatory bodies that focus almost exclusively on such claims, the proposed hybrid system would facilitate the accumulation of the expertise necessary to successfully resolve these issues.<sup>173</sup>

Likewise, although agency resolution in its current form is usually accomplished through “formal individualized adjudications . . . conducted on a case-by-case basis by ALJs,” a small number of administrative programs have quietly adopted mass resolution procedures that reflect those successfully applied in the private law.<sup>174</sup> In fact, the Office for Medicare Hearings and Appeals (“OMHA”) recently adopted procedures that, in many ways, parallel those proposed by this Article: the OMHA “Statistical Sampling Initiative” “allows hospitals, doctors, and other medical providers with large numbers of similar claims to conduct ‘trials by statistics,’” which allow an Administrative Law Judge to “extrapolate the average result” of a small number of similar claims to the whole, under the supervision of one of Medicare’s “‘trained and experienced statistical expert[s]’ to develop the ‘appropriate sampling methodology.’”<sup>175</sup> The National Vaccine Injury Compensation Program similarly employs a process that resembles federal multidistrict litigation, pooling the claims of children injured by vaccines.<sup>176</sup> And the Equal Employment Opportunity Commission modeled its own

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171. Jeffrey Axelrad, *Federal Tort Claims Act Administrative Claims: Better than Third-Party ADR for Resolving Federal Tort Claims*, 52 ADMIN. L. REV. 1331, 1338 (2000) (quoting 28 U.S.C. § 2674 (1994)). The FTCA also does not support claims for strict or absolute liability. See 28 U.S.C. § 1346(b) (2018).

172. Axelrad, *supra* note 171, at 1339 (discussing the many successes of the FTCA administrative claims model); see also Paul F. Figley, *Understanding the Federal Tort Claims Act: A Different Metaphor*, 44 TORT TRIAL & INS. PRAC. L.J. 1105, 1138 (2009) (“The FTCA succeeds at the task Congress set for it.”).

173. The reviewing administrative court would also manage whatever discovery is necessary, possibly adopting discovery procedures similar to private law. See Richard T. Freije, *The Use of Discovery Sanctions in Administrative Agency Adjudication*, 59 IND. L.J. 113, 116 (1983) (discussing to what extent agencies can and should use discovery sanctions); Seth D. Montgomery, Note, *Discovery in Federal Administrative Proceedings*, 16 STAN. L. REV. 1035, 1077 (1964) (discussing the policy arguments for and against administrative agencies adopting the Federal Rules of Civil Procedure’s discovery procedures).

174. Sant’Ambrogio & Zimmerman, *supra* note 155, at 1641.

175. *Id.* at 1638–39 (alteration in original) (citation omitted) (examining the ways that administrative agencies use procedures from class actions and complex litigations).

176. Stephen D. Sugarman, *Cases in Vaccine Court—Legal Battles over Vaccines and Autism*, 357 NEW ENG. J. MED. 1275, 1276 (2007); see, e.g., *Capizzano v. Sec’y of Health & Human Servs.*, 440 F.3d 1317, 1319 (Fed. Cir. 2006); *Snyder ex rel. Snyder v. Sec’y of Health & Human Servs.*, 88 Fed. Cl. 706, 712 (Fed. Cl. 2009).

administrative class action procedure after Rule 23 to resolve “pattern and practice” discrimination claims before administrative judges.<sup>177</sup> Although administrative agencies’ use of mass adjudication techniques still remains in its infancy, these experiments have thus far been largely successful,<sup>178</sup> which lends credence to the usefulness of administrative agencies in this context.<sup>179</sup>

### iii. Proportional Recovery

Once general causation is established, the administrative body would seek to craft as scientifically supported a recovery as possible. As described in Section III.B, this would involve grouping all injured or exposed “plaintiffs” and all possibly responsible “defendants” and designing a proportional compensation scheme. At this stage, the plaintiffs and defendants could present competing evidence detailing the extent of the injury and the adjudicatory body would choose the formula that best approximated the harm.

Proportional recovery for the plaintiffs would be based largely on the evidence provided by the epidemiological study or studies.<sup>180</sup> The epidemiological point estimate provides the best baseline for determining the likelihood that a plaintiff was injured by a defendant, but a legislature could reasonably peg recovery to any point within the confidence interval.<sup>181</sup> So long as this determination applied equally and consistently to all mass torts—preserving predictability and horizontal equity—where within a confidence interval to set recovery could be a political decision. The reviewing adjudicators could then adjust this amount to account for each plaintiff’s specific risk factors: a plaintiff who smokes, for example, is less likely to have had her heart attack caused by a defective drug (because her smoking

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177. See 29 C.F.R. § 1614.204 (2020); see also FED. R. CIV. P. 23.

178. Sant’Ambrogio & Zimmerman, *supra* note 155, at 1683.

179. Richard Nagareda suggests resolving *all* mass torts within an administrative framework. This Article does not go so far. The specific causation requirement’s shortcomings do not impact all mass torts, nor do they only impact mass torts. The problem to which Nagareda directs his proposal is different from that addressed by this Article. NAGAREDA, *supra* note 142, at 237 (proposing “link[ing] the rewards for plaintiffs’ lawyers from the representation of present claimants to the viability of the peace arrangement for future ones,” and thereby resolving the Supreme Court’s problem in *Amchem*—an elegant solution that does little for this Article’s identified problem). Thus, the question of the merits of Nagareda’s proposal, and of whether every mass tort should be administratively resolved, falls outside the scope of this Article.

180. See *infra* Section III.B.1; *supra* note 37 (describing how computational models can also be used to analyze evidence from multiple sources); *supra* note 123 (discussing some of the concerns associated with using computational models).

181. See *supra* Section III.B.1. See generally *supra* notes 109–10 (discussing confidence intervals). For example, an aggressive legislature, seeking to prioritize deterrence and compensation, could peg recovery to the highest estimate of liability provided by a 68 percent confidence interval. Or, a conservative legislature, wishing to err on the side of avoiding over-deterrence and overcompensation, could peg recovery to the lowest estimate of liability provided by a 68 percent confidence interval.

may have caused the heart attack) than a plaintiff who does not smoke. In making such determinations, the adjudicator(s) could use a recovery formula, individual adjudication, or whatever else was situationally called for.<sup>182</sup>

Plaintiffs would be permitted to opt out, and, as in class actions, plaintiffs who do not opt out would be bound by the recovery.<sup>183</sup> Because the extent of the recovery would be driven primarily by administrative adjudicators rather than by claimant's counsel, there is less of a need to allow objectors, who function "as a market check on the propensity of counsel to serve their own interests over those of the class."<sup>184</sup> Moreover, the presence of government regulators, who can intervene to prevent unfair deals, likewise serves as a check against the sort of agency-cost problems that lurk beneath so many class action settlements.<sup>185</sup> Nevertheless, because these built-in protections may not fully immunize the hybrid recovery system from intra-class conflicts or inadequate representation, it may be prudent to consider maintaining class action-like procedures that protect against these risks—including allowing objectors to challenge the structure of the recovery.<sup>186</sup>

Proportional liability for defendants would reflect the extent of the overall injury for which each defendant was responsible—based, where there is no better method of calculating liability, on that party's relative participation in the market.<sup>187</sup> This, then, could be adjusted based on individual defendant risk factors to account for a defendant's particularly reckless or safe practices. The intuitive simplicity of such a system, however,

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182. Cf. Linda S. Mullenix, *Mass Tort Funds and the Election of Remedies: The Need for Informed Consent*, 31 REV. LITIG. 833, 838 (2012).

183. Theodore Eisenberg & Geoffrey Miller, *The Role of Opt-Outs and Objectors in Class Action Litigation: Theoretical and Empirical Issues*, 57 VAND. L. REV. 1529, 1534–35 (2004). There may be exceptions to this when justice so requires—like in the limited fund context. See *Ortiz v. Fibreboard Corp.*, 527 U.S. 815, 838–40 (1999).

184. Eisenberg & Miller, *supra* note 183, at 1536.

185. Edward Brunet, *Class Action Objectors: Extortionist Free Riders or Fairness Guarantors*, 2003 U. CHI. LEGAL F. 403, 405 ("The theoretical attack on class actions rests heavily upon the agency cost problem . . .").

186. See *generally id.* (articulating the important role played by class action objectors and arguing for a more liberal stance toward class action objectors). Another option that would help mitigate these risks would be to adopt a more inquisitorial and neutral administrative review of not just the question of epidemiological causation, but also of the other legal questions at issue, like negligence. This would have the further benefit of reducing the expected workload for plaintiffs' lawyers—thereby increasing the net value of administrative claims and prompting greater investment in the investigation of these cases. See *e.g.*, Amalia D. Kessler, *Our Inquisitorial Tradition: Equity Procedure, Due Process, and the Search for an Alternative to the Adversarial*, 90 CORNELL L. REV. 1181, 1184–85 (2005) (arguing that inquisitorial procedures need not threaten due process and advocating for a broader move towards inquisitorial justice).

187. See *supra* Section III.B.2; see also, *e.g.*, *Sindell v. Abbott Labs.*, 607 P.2d 924, 937 (1980) (applying market share liability to the DES litigation).

would be complicated in circumstances in which one or more defendants are found *not* to be negligent: assuming that negligence is a necessary element for the underlying tort in question, a non-negligent defendant should not be required to pay.<sup>188</sup> This could be resolved by eliminating the harm caused by non-negligent defendants from the total calculated liability to ensure that each injured plaintiff's recovery reflected the probability that he or she was injured by a negligent defendant.<sup>189</sup> And then, under such a resolution, the total liability borne by defendants would mirror the total injury resulting from negligence.<sup>190</sup>

An administrative recovery scheme could also be continually updated to account for improvements in the estimates of harm provided by scientific research. Unlike class action damages—which almost always consist of lump-sum awards fixed at a moment in time shortly after trial (or during settlement negotiations)—administrative recovery schemes may be more freely structured to meet the interests of justice. Individual awards could even be intentionally delayed—structured like annuities, for example—to allow administrative refinements to apply both prospectively and retroactively. Regardless of the exact mechanism used, the flexibility of administrative recovery would allow adjudicators to continually improve the accuracy of their awards.<sup>191</sup>

The systemic costs of an administrative hybrid system would be substantially lower than in class actions. This is largely because plaintiffs' lawyers' contingency fees, which are typically the largest non-recovery cost of mass torts, could be dramatically reduced within this system without compromising plaintiffs' lawyers' incentive to investigate and pursue these cases.<sup>192</sup> In *qui tam* actions—likely the closest parallel to the proposed system—plaintiffs' lawyers typically collect 7.5 to 15 percent of the total

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188. As previously discussed, there is no conceptual need to change the other non-causation elements of the torts in question.

189. This could be further refined by adjusting individual injuries where there is some information indicating which defendants could or could not have injured each plaintiff. For example, even where it is impossible to determine which of three manufacturers of a product caused a plaintiff's injury, if none of those manufacturers are found to be negligent, the plaintiff should not recover for her injury. Or, where it appears that a plaintiff is more likely than average to have been injured by a negligent defendant because of the range of products to which she could have been exposed, her recovery should be increased accordingly.

190. Alternatively, negligent defendants could be held liable for harms caused by their non-negligent compatriots. Under this scheme, the total amount of liability would continue to reflect the total harm caused to society, but at the cost of potential over-deterrence. On the other hand, the former option—reducing the total liability pool—risks undercompensating plaintiffs.

191. As discussed in Section IV.A, this would mitigate the risk of basing liability on an initial blockbuster study later shown to be misleading.

192. The administrative costs of this proposal—which, given the efficiency of administrative adjudication, should be relatively lower than class action court costs—could either be deducted from the total recovery or be subsidized by public funding.

recovery. And yet, despite these relatively small contingencies, the cost-benefit calculation of qui tam litigation has arguably been *too* favorable for plaintiffs' lawyers.<sup>193</sup> Given the relatively low costs and uncertainty associated with administratively adjudicating cases afflicted by the specific causation requirement's shortcomings in the manner proposed by this Article—the primary questions involve the evaluation and application of existing epidemiological evidence—awards in this range should be more than enough to render administrative hybrid claims attractive to plaintiffs' lawyers. Thus, vigorous private representation could be guaranteed within the administrative hybrid system at a relative pittance.<sup>194</sup>

And, in fact, moving the resolution of the specific causation requirement to the administrative system may be less dramatic than it at first would seem: the private law's resolution of mass torts already “resemble[s] regulatory policymaking.”<sup>195</sup> As tort law increasingly has trended towards utilitarianism—led by scholars like Steven Shavell, Richard Posner, and Guido Calabresi—the resolution of mass torts has become increasingly regulatory in nature.<sup>196</sup> Although some courts have resisted this impulse, maintaining that tort law must be considered “in rights-based terms, as a vehicle for the achievement of corrective justice between the particular parties to the lawsuit” (thereby creating horizontal inequity in the process), there has been an unmistakable shift in the private law towards public ends.<sup>197</sup> The path, from private law, to pseudo-administrative, to administrative resolution, would not even be a novel one: environmental cases followed a similar path from nuisance torts to regulatory adjudication. Transitioning cases impacted by the specific causation requirement's limitations to the administrative law system may therefore shock the system less than it might otherwise appear.

As a result, the proposed alternative resolution system should combine the investigatory zealotry of private law enforcement with the expertise and efficiency of administrative adjudication. The market—and not politics—will continue to dictate which potential cases are investigated and brought to trial. Yet, it will do so at a far lower overall systemic cost than what is currently standard in the private law or even in qui tam FCA actions: even accounting for administrative costs, approximately 80 to 90 percent of the total recovery will go to injured parties—far more than the what is

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193. *E.g.*, Engstrom, *supra* note 148, at 1247.

194. Principal-agent problems may exist even within such a system. For a detailed discussion of principal-agent problems in administrative settlements and a proposal of several means of mitigating such problems, see Adam S. Zimmerman, *Distributing Justice*, 86 N.Y.U. L. REV. 500, 540–41 (2011).

195. NAGAREDA, *supra* note 142, at 5.

196. *Id.* at 6; *see also* Kaplow & Shavell, *supra* note 77, at 967–76.

197. NAGAREDA, *supra* note 142, at 6.

standard in private law. And because plaintiffs' lawyers' recovery would be split among far fewer lawyers than is typical for class actions and much of the cost of litigation would be borne by the administrative body, lawyers will still be strongly incentivized to bring these claims, even with smaller contingency payments. Such an administrative hybrid would therefore serve as an ideal vehicle for resolving specific causation.

## B. ALTERNATIVES

This Article concludes by discussing possible alternatives, including a purely private or a purely administrative regime. Neither private law nor administrative law alone will as adequately resolve the substantive and procedural issues raised by the specific causation requirement as will a hybrid solution.

### 1. Class Actions: No Longer a "Solution" for Specific Causation

In 1984, it likely seemed that many of the concerns raised by mass tort litigation could be resolved effectively through private law.<sup>198</sup> The strong profit motive underlying private law litigation provides a powerful incentive to investigate and develop even difficult or politically unpopular cases. Class actions, in particular, appeared to be the ideal vehicle for resolving mass torts in a manner fair both to plaintiffs and to defendants: mass torts of the 1970s, 1980s, and 1990s had created a crushing burden on the judicial system, and courts responded by facilitating creative class structures for mass tort settlement.<sup>199</sup> For example, in *Ahearn v. Fibreboard Corp.*, the district court sought to address the problem of the financial drain of mass tort defense on a defendant teetering on insolvency.<sup>200</sup> By interpreting Rule 23(b)(1)(B)'s historical limited fund criteria loosely, the court gave "the class as a whole . . . the best deal"<sup>201</sup> by allowing the defendant "to remain a working enterprise, rather than slowly forcing it into bankruptcy."<sup>202</sup>

As mass injuries presented increasingly complex questions, however, lower courts grew reluctant to relax the individual burdens of causation and

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198. See, e.g., Rosenberg, *supra* note 100, at 851–60.

199. See DEBORAH R. HENSLER ET AL., CLASS ACTION DILEMMAS: PURSUING PUBLIC GOALS FOR PRIVATE GAIN 24–25 (2000) (describing as notable, the Agent Orange certification, the Fifth Circuit's first ever upholding of an asbestos class certification, and a surprising Sixth Circuit reversal of its previous denial of class certification for personal injury claims).

200. *Ortiz v. Fibreboard Corp.*, 527 U.S. 815, 828 (1999) (discussing the underlying district court case, *Ahearn v. Fibreboard Corp.*, 162 F.R.D. 505, 508 (E.D. Tex. 1995), *aff'd sub nom, In re Asbestos Litig.*, 90 F.3d 963 (5th Cir. 1996)).

201. *Id.* at 839.

202. *Id.* at 883 (Breyer, J., dissenting).

responsibility.<sup>203</sup> And it was not long before the Supreme Court weighed in on the inappropriateness of the class action format for mass exposure cases more generally: however societally necessary mass exposure tort class certification appeared in *Amchem Products, Inc. v. Windsor* and *Ortiz v. Fibreboard Corp.*, the Supreme Court maintained that class actions presented too many risks to absent class members—like “unwarranted or overbroad class definitions”—to allow courts to sidestep Rule 23’s safeguards.<sup>204</sup>

This may be for the best: the class action innovations of the 1970s, 1980s, and 1990s uncovered deep-seated structural problems with using the class action format for mass torts. Where class actions were once welcomed, they have proven both unreliable and inefficient for resolving mass torts. Because class actions rely on judges and juries with little scientific training, mass tort awards regularly fail to approximate the actual harm inflicted by defendants or experienced by plaintiffs.<sup>205</sup> The breast implant class action settlement—a large settlement that was reached absent strong evidence of even general causation—demonstrates the danger of trusting such significant matters to a jury of peers.<sup>206</sup> And contingency fees have imposed a severe tax on class action recovery. After accounting for court costs, contingency fees have led to numerous settlements that provide little benefit for members of the class but large cash awards for plaintiffs’ lawyers.<sup>207</sup> Class actions have also proved ill equipped for many of the other challenges that arise in mass torts, like the question of future injuries or the management of conflicts

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203. See Donald G. Gifford, *Challenge to the Individual Causation Requirement in Mass Products Torts*, 62 WASH. & LEE L. REV. 873, 880 (2005) (“By the late 1980s, with rare exceptions, it was clear that these challenges to the principle of individual causation were unsuccessful.”); see also *Becker v. Baron Bros.*, 649 A.2d 613, 620–21 (N.J. 1994) (refusing to extend market share liability to asbestos); *Shackil v. Lederle Labs.*, 561 A.2d 511, 529 (N.J. 1989) (same, to vaccines); *Hamilton v. Beretta U.S.A. Corp.*, 750 N.E.2d 1055, 1067 (N.Y. 2001) (same, to handguns); *Skipworth by Williams v. Lead Indus. Ass’n*, 690 A.2d 169, 172 (Pa. 1997) (same, to lead paint). But see *In re Methyl Tertiary Butyl Ether (“MTBE”) Prods. Liab. Litig.*, 379 F. Supp. 2d 348, 375 (S.D.N.Y. 2005) (reviving market share liability for MTBE); *Thomas ex rel. Grambling v. Mallett*, 701 N.W.2d 523, 567 (Wis. 2005) (allowing victims of childhood lead poisoning to recover against lead pigment manufacturers on a “risk contribution” basis).

204. *Amchem Prods., Inc. v. Windsor*, 521 U.S. 591, 620 (1997); see also *Ortiz*, 527 U.S. at 847.

205. Lay judges and juries, for example, may not recognize when a study is poorly conducted. And even well-conducted studies reporting accurate results can mislead. For example, an epidemiological study may report on the effects of a chemical compound on Oregon Medicaid users. Where the class action involves only Illinois residents who used the name brand version of that compound, lay judges and juries will be asked to extrapolate from the results of the study in ways that may or may not be scientifically supported. This hypothetical is representative of a common problem in class action litigation, where epidemiological evidence rarely informs on the *exact* population of the class in question.

206. Although one study supported the claimed recovery, expert adjudicators would have approached evidence provided by a single study with more caution.

207. See e.g., *In re Auction Houses Antitrust Litig.*, 197 F.R.D. 71, 77–78 (S.D.N.Y. 2000); *In re Oracle Sec. Litig.*, 131 F.R.D. 688, 696 (N.D. Cal.), *modified*, 132 F.R.D. 538 (N.D. Cal. 1990).

often inherent in large and diverse classes.<sup>208</sup>

As a practical matter, the Supreme Court's Rule 23 jurisprudence now bars even careful courts from extending Rule 23 to meet the increasingly complex problems posed by modern-day mass torts.<sup>209</sup> Any class action resolution to the specific causation requirement's challenges must, therefore, originate in sweeping legislative changes to Rule 23. Although class actions and class-like private law structures once appeared to be an attractive mechanism for resolving mass exposure torts, now, in hindsight, their advantages may not outweigh their costs; the high systemic cost of contingency fee litigation, for example, will not be alleviated by relaxing the specific causation requirement in class actions.<sup>210</sup>

## 2. MDLs Are Hardly Better

Following the Supreme Court's increasingly discouraging stance toward class actions, much of the resolution of mass torts has shifted to multi-district litigation ("MDLs"). MDLs are a statutorily authorized device for consolidating the pretrial proceedings of individual federal cases that share a common question of fact.<sup>211</sup> Similar to class actions, the goal of the MDL aggregation mechanism is efficiency and uniformity: "The basic idea is that it is more efficient to conduct pretrial proceedings in cases involving the same questions only one time and before only one judge, rather than over and over again before many."<sup>212</sup> In theory, because each litigant in an MDL is represented by her own lawyer and will receive an individual trial, the MDL structure preserves many of the advantages of class actions without raising the same due process and individual autonomy concerns that have

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208. Insurance funds and damage scheduling, two promising administrative law ideas proposed for class action use by Rosenberg, may run afoul of due process and are often not vigorously pursued by plaintiffs' attorneys, who seek to maximize their guaranteed recovery while minimizing the costs necessary to achieve that recovery. *E.g.*, Sergio J. Campos, *Mass Torts and Due Process*, 65 VAND. L. REV. 1059, 1075–76 (2012); John C. Coffee, Jr., *Conflicts, Consent, and Allocation After Amchem Products—or, Why Attorneys Still Need Consent to Give Away Their Clients' Money*, 84 VA. L. REV. 1541, 1550 (1998) (noting that, although plaintiffs' counsel has a "strong incentive to maximize the settlement fund," there is "[n]o similar incentive [that] presently aligns the interests of counsel with a fair allocation of the fund").

209. The Supreme Court has also rejected other novel approaches designed to solve problems that often arise in class actions—like using statistical sampling to engage in de facto "[t]rial[s] by [f]ormula." *E.g.*, *Wal-Mart Stores, Inc. v. Dukes*, 564 U.S. 338, 367 (2011) (holding that this stretched the hearing procedures too far under the Rules Enabling Act).

210. There are no obvious solutions to the burden imposed by contingency fees within the current system: contingency fee caps, for example, could decrease the systemic cost of plaintiffs' lawyers' fees—but only by undermining lawyers' incentive to investigate and bring these cases.

211. *See* 28 U.S.C. § 1407 (2018).

212. Andrew D. Bradt & Zachary D. Clopton, *MDL v. Trump: The Puzzle of Public Law in Multidistrict Litigation*, 112 NW. U. L. REV. ONLINE 85, 87 (2018).

cast a pall over class action litigation.<sup>213</sup>

However, in practice, MDLs have exhibited many of the same shortcomings that led to the disfavoring of class action litigation. In fact, as Elizabeth Chamblee Burch and Margaret Williams have shown, the MDL structure may even enhance agency-cost problems, as repeat-player plaintiffs' lawyers negotiate sweetheart deals at the expense of individual plaintiff recoveries.<sup>214</sup> Moreover, the non-class aggregate settlements that typically spring from MDLs are rife with the same sort of attorney-recommendation and lock-in provisions that ethicists condemned in the Vioxx Agreement.<sup>215</sup> As a result, MDLs represent, at best, an imperfect procedural vessel for the resolution of the specific causation requirement.

But even casting these concerns aside, MDLs do not provide a solution to private law's struggles with complicated scientific evidence. As is the case with class actions, the MDL format is simply an aggregation mechanism. Thus, even were it otherwise desirable to implement a system of proportional recovery within the current MDL framework, the resulting demands on lay judges and juries—who would be asked to evaluate and apply challenging epidemiological studies—would likely be too much.<sup>216</sup> Indeed, as the procedural requirements of mass litigation continue to evolve, courts continue to innovate new shortcuts to manage the crush of litigation; although such developments, like *Lone Pine* orders, are helpful for case management, they increase the pressure on courts to resolve specific causation earlier in litigation without better facilitating the review or development of supporting scientific evidence.<sup>217</sup>

It may yet be possible to design a workable legislative mass-aggregation solution to the specific causation requirement's shortcomings, but, as this Article's discussion indicates, a quasi-public law approach presents a more promising alternative.

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213. For this reason, MDLs do not present the same advantage to small value claims plaintiffs. Nevertheless, the promise of MDLs—combined with tort law's desperate need for aggregate systems of resolution—has pushed fully one third of all civil cases into an MDL. *Id.*

214. Elizabeth Chamblee Burch, *Monopolies in Multidistrict Litigation*, 70 VAND. L. REV. 67, 70 (2017); see also Elizabeth Chamblee Burch & Margaret S. Williams, *Repeat Players in Multidistrict Litigation: The Social Network*, 102 CORNELL L. REV. 1445, 1496–1501 (2017).

215. Burch & Williams, *supra* note 214, at 1496–1501; Noah Smith-Drelich, *Curing the Mass Tort Settlement Malaise*, 48 LOY. L.A. L. REV. 1, 37 (2014) (describing these problems in detail).

216. Nor do MDLs significantly alleviate the significant tax on recoveries imposed by contingency fees.

217. *E.g.*, Nora Freeman Engstrom, *The Lessons of Lone Pine*, 129 YALE L.J. 2, 34–51 (2019).

### 3. Administrative Law's Limitations

Another seemingly promising alternative, a purely administrative system of mass tort adjudication, also comes with serious limitations. Such a regime will rely on agency employees to vigorously investigate, develop, and pursue potential mass torts. Because administrative prosecutors collect a salary regardless of how aggressively or successfully they discover and pursue malfeasance, there is a tendency among government regulators “to underenforce certain statutory requirements.”<sup>218</sup> This problem is further exacerbated by the funding woes that haunt so many agencies: “many agencies simply lack the capacity to enforce the law adequately.”<sup>219</sup> Moreover, agency adjudication is susceptible to capture—when government regulators bow to political pressure or to lobbying by regulated entities and therefore shirk in their prosecutorial duties.<sup>220</sup> And even when agencies successfully attain a large recovery, agencies typically lack procedural safeguards to ensure that both corrective justice and utilitarian goals are furthered by the recovery.<sup>221</sup> Finally, a substantial amount of the legal innovation that has occurred over the past several decades has been from plaintiffs’ attorneys in the context of private enforcement suits.<sup>222</sup> Conservative government regulators, on the other hand, have not shown a great willingness to experiment with novel approaches.<sup>223</sup>

### CONCLUSION

Modern hazards have tested common law notions of causation and responsibility—to a mixed effect. The mismatch between science’s capabilities and tort law’s requirements has led judges and juries to reach for justice in an unfair system, resulting in widespread inconsistency and injustice.<sup>224</sup>

Indeed, several important observations have emerged over the course

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218. Stephenson, *supra* note 15, at 110.

219. *Id.* at 107; *see also* U.S. FOOD & DRUG ADMIN., PATHWAY TO GLOBAL PRODUCT SAFETY AND QUALITY 3 (2011) (“[The] FDA does not—nor will it—have the resources to adequately keep pace with the pressures of globalization.”).

220. Stephenson, *supra* note 15, at 130.

221. Zimmerman, *supra* note 194, at 518.

222. Barton H. Thompson, Jr., *The Continuing Innovation of Citizen Enforcement*, 2000 U. ILL. L. REV. 185, 188, 206.

223. Stephenson, *supra* note 15, at 112–13 (using the example of “supplemental enforcement projects” in environmental enforcement cases to illustrate the sort of creative device pioneered by private attorneys).

224. *See e.g., Don’t Sour Tort Reform in Indiana*, THE TIMES (Munster, Ind.), Oct. 25, 2011, at A6; *Certain Tort Reforms Overdue in Pennsylvania*, PATRIOT-NEWS, [http://www.pennlive.com/editorials/index.ssf/2011/03/empty\\_the\\_pockets\\_lawmakers\\_mu.html](http://www.pennlive.com/editorials/index.ssf/2011/03/empty_the_pockets_lawmakers_mu.html) [<https://perma.cc/5LH8-SLXE>]; *Tort-Scam Takedown*, N.Y. POST (Mar. 5, 2012, 5:00 AM), [http://www.nypost.com/p/news/opinion/editorials/tort\\_scam\\_takedown\\_ftwC4JMqjPPXuO8sphjdN](http://www.nypost.com/p/news/opinion/editorials/tort_scam_takedown_ftwC4JMqjPPXuO8sphjdN) [<https://perma.cc/FF3M-XZ9E>].

of the modern tort era. First, judges and juries are not well-equipped to evaluate the increasingly challenging questions of causation at the heart of most mass torts.<sup>225</sup> The specific causation requirement therefore presents a procedural as well as a substantive challenge for torts. Aligning science with the law in the context of specific causation will therefore be difficult within a private law system that relies on lay judges and juries. Otherwise, the result will reflect that achieved in the breast implant litigation: “performative causation” trading on pseudoscience and individual juries’ perception of fairness triumphing over justice. Second, the financial incentives that drive private litigation can warp recoveries, leading to settlements crafted to benefit plaintiffs’ lawyers over plaintiffs—all at a substantial cost to the system. But these incentives can also be channeled for good; as *qui tam* litigation has shown, the zeal of plaintiffs’ attorneys is a powerful tool that can be as effective in pursuing public ends as private. Third, while the specific causation requirement’s shortcomings have been largely overlooked by policymakers, its effects—on individual litigants and on the public as a whole—continue to spread, unimpeded by the advances of science (in part because science remains unable to answer questions of specific pathogenesis or specific responsibility).<sup>226</sup> Thus, specific causation remains a substantive and procedural problem that the existing legal system appears increasingly unwilling and unable to appropriately address.

Some of the procedural consequences of the specific causation requirement’s limitations—the need for expert adjudicators and the high cost of contingency fees in particular—present challenges in other contexts as well. As a result, the administrative hybrid solution proposed by this Article could also be adopted elsewhere: many of the systemic advantages that it provides would mitigate problems that persist throughout private law. Such a reform would not render scientifically improbable recoveries impossible.<sup>227</sup> But it would prompt a shift toward disputes using optimal tools and toward a truly expert adjudication of such disputes—and at a relative systemic discount. This would, in many instances, represent a significant improvement over the current system.

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225. See ANGELL, *supra* note 30, at 111–32.

226. See Gold, *When Certainty Dissolves into Probability*, *supra* note 126, at 319 (arguing that scientific advances will broaden our recognition of population-level harms without providing an accompanying depth of understanding about those harms, thereby increasing this problem).

227. Although it may be tempting to restrict this model’s applicability to mature litigation cycles—doing so would significantly diminish the possibility of improperly basing recovery on an early outlier study—the proposed *qui tam* trigger’s incentivization of private attorneys to investigate and bring claims to the attention of regulatory agencies represents an important advantage of this model. Concern over the influence of outlier studies may therefore be better addressed in the ways discussed in Section IV.B.

The qui tam-like trigger proposed by this Article is not the only possible way of linking litigation with the regulatory process: Congress could replace private state tort claims with an administrative claim for penalties, similar to what currently exists within the Food, Drug, and Cosmetic Act; Congress could fully replace private tort claims with private claims that would be adjudicated within the agency; or Congress could implement a scheme in which private claimants could refer certain issues to the agency for resolution.<sup>228</sup> But the corrective justice and utilitarianism concerns that support grouped epidemiology-based proportional recovery also most support the proposed administrative hybrid solution—while avoiding the Seventh Amendment issues raised by any solution that relies on preemption.<sup>229</sup>

Whatever the exact means, some change is undoubtedly necessary. So long as dangerous agents create little-understood harms, the specific causation requirement will continue to impede justice.

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228. These are each options proposed and discussed by Catherine Struve in *The FDA and the Tort System: Postmarketing Surveillance, Compensation, and the Role of Litigation*. Catherine T. Struve, *The FDA and the Tort System: Postmarketing Surveillance, Compensation, and the Role of Litigation*, 2 YALE J. HEALTH, POL'Y L. & ETHICS 587, 654–66 (2005) (concluding that a similar qui tam mechanism to the one proposed in this Article presents the best, and most constitutional, balance of private and public systems).

229. See *supra* Section IV.B (considering the advantages of the proposed hybrid system); see also Struve, *supra* note 228. Each of the alternatives considered by Struve involves preemption—and therefore implicates the Seventh Amendment. *Id.* at 591–92 (concluding that some of these options likely violate the Seventh Amendment). Although the United States here would have a similarly strong *parens patriae* interest in resolving cases hobbled by the demands of the specific causation requirement, as is discussed in Section IV.B, it may not be necessary to preempt existing claims to resolve these problems.