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CAUSATION IN CASES OF EVIDENTIAL UNCERTAINTY: JURIDICAL TECHNIQUES AND FUNDAMENTAL ISSUES*

KEN OLIPHANT*

INTRODUCTION

The topic of “causal uncertainty”¹ is rather large, and is here addressed only from one particular angle. The focus of this article is on that particular subset of issues of causal uncertainty that is termed “alternative causation” and it looks at that subject matter from a comparative legal perspective in connection with liability in the law of torts (or non-contractual liability for damage, which is the more common term in Continental Europe).² In this context, “alternative causation” refers to a situation where there are two or more rival explanations of how the claimant’s injury was caused, and the defendant’s tortious conduct is part of one explanation, but not part of the other(s). It is a case of “either . . . or . . .,” rather than “both . . . and . . .” Admittedly, questions of alternative causation often coincide in real cases with questions of “additional” or “cumulative” causation, but analytically they are distinct and should be addressed separately.

The classic illustration of alternative causation is the well-known “hunters case,” where two hunters fire negligently in the direction of an innocent bystander, who is injured by a bullet, but it cannot be determined

* This is the revised text of the author’s keynote address delivered at the conference *Causation, liability and apportionment: an interdisciplinary perspective: Law, Economics and Philosophy* held at the *Cour de Cassation* (Supreme Court) in Paris on September 12, 2014.

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1. For the author’s previous work on this topic from the perspective of English and comparative law, see Ken Oliphant, *Causal Uncertainty and Proportional Liability in England and Wales*, in *PROPORTIONAL LIABILITY: ANALYTICAL AND COMPARATIVE PERSPECTIVES* 121 (Israel Gilead et al. eds., 2013); Ken Oliphant, *Uncertain Causes: The Chinese Tort Liability Act in Comparative Perspective*, in *TOWARDS A CHINESE CIVIL CODE: COMPARATIVE AND HISTORICAL PERSPECTIVES* 395 (Lei Chen & C.H. (Remco) van Rhee eds., 2012) [hereinafter Oliphant, *Uncertain Causes*]; Ken Oliphant, *Alternative Causation: A Comparative Analysis of Austrian and English Law*, in *FESTSCHRIFT FÜR HELMUT KOZIOL ZUM 70. GEBURTSTAG 795* (Peter Apathy et al. eds., 2010); Ken Oliphant, *Proportional Liability*, in *INTERDISCIPLINARY STUDIES OF COMPARATIVE AND PRIVATE INTERNATIONAL LAW* 179 (Bea Verschaegen ed., vol. 1 2010); Ken Oliphant, *Fairchild v Glenhaven Funeral Services Ltd. (2002)*, in *LANDMARK CASES IN THE LAW OF TORT* 335 (Charles Mitchell & Paul Mitchell eds., 2010); Ken Oliphant, *Uncertain Factual Causation in the Third Restatement*, 37 *WM. MITCHELL L. REV.* 1599 (2011) [hereinafter Oliphant, *Uncertain Factual Causation*]; Ken Oliphant, *Loss of Chance in English Law*, 16 *EUR. REV. PRIV. L.* 1061 (2008).

2. See CEES VAN DAM, *EUROPEAN TORT LAW* 4–5 (2d ed. 2013).

from whose gun it was fired.³ Even applying the common law's relatively low standard of proof—the balance of probabilities—neither hunter was the cause of the bystander's injury because neither was *more likely than not* the source of the bullet that did the damage.⁴ The same pertains *a fortiori* if a higher standard of proof, as is found in France and other civilian jurisdictions, is applied.⁵

The hunters case provides a simple and striking example of the difficulty that arises where there are alternative causes of the claimant's injury and neither can be proven to have actually been causal under the orthodox standard of proof. Similar difficulties arise in other recognizable categories of cases, e.g., where the failure to diagnose a medical condition means that the patient is deprived of the chance to receive treatment, and hence of the chance of recovery; or where a group of people is exposed to a toxic substance that increases the incidence in that population of a given health condition, but it cannot be shown which of those developing the condition were injured by the toxin, and which of them suffered the condition independently.

Such cases highlight a number of deficiencies of the orthodox approach whereby the claimant must prove the existence of a causal link between the defendant's tortious conduct and the damage, according to a specified and generally applicable standard of proof (depending on which country one is in, it could be the "balance of probabilities," "the conviction of the judge," or some alternative standard).⁶ Amongst the most significant criticisms⁷ are the following:

3. In the United States, see *Summers v. Tice*, 199 P.2d 1 (Cal. 1948). In Canada, see *Cook v. Lewis*, [1951] S.C.R. 830 (Can.).

4. Assuming that each hunter fired only once, or fired an equal number of shots, and there were no other circumstances pointing to one rather than the other.

5. On standards of proof, see Kevin M. Clermont, *Standards of Proof Revisited*, 33 VT. L. REV. 469 (2009); Kevin M. Clermont & Emily Sherwin, *A Comparative View of Standards of Proof*, 50 AM. J. COMP. L. 243 (2002); Christoph Engel, *Preponderance of the Evidence Versus in Time Conviction: A Behavioral Perspective on a Conflict Between American and Continental European Law*, 33 VT. L. REV. 435 (2009); Ivo Giesen, *The Burden of Proof and Other Procedural Devices in Tort Law*, in EUROPEAN TORT LAW 2008 49, 53–55 (Helmut Koziol & Barbara C. Steininger eds., 2009); Michele Taruffo, *Rethinking the Standards of Proof*, 51 AM. J. COMP. L. 659 (2003); Vibe Ulfbeck & Marie-Louise Holle, *Tort Law and Burden of Proof—Comparative Aspects. A Special Case for Enterprise Liability?*, in EUROPEAN TORT LAW 2008, *supra*, at 26, 28–29; Richard W. Wright, *Proving Facts: Belief Versus Probability*, in EUROPEAN TORT LAW 2008, *supra*, at 79.

6. See sources cited *supra* note 5.

7. For useful overviews, see ARIEL PORAT & ALEX STEIN, TORT LIABILITY UNDER UNCERTAINTY 1–83 (2001); William M. Landes & Richard A. Posner, *Tort Law as a Regulatory Regime for Catastrophic Personal Injuries*, 13 J. LEGAL STUD. 417 (1984); Glen O. Robinson, *Multiple Causation in Tort Law: Reflections on the DES Cases*, 68 VA. L. REV. 713 (1982); David Rosenberg, *The Causal Connection in Mass Exposure Cases: A "Public Law" Vision of the Tort System*, 97 HARV. L. REV. 849 (1984). Regarding other legal systems, see HELMUT KOZIOL, BASIC QUESTIONS OF TORT

(a) “All or nothing” is unfair because crucial differences in outcome can result from small differences in probability (especially between 50% and 51% cases, where the balance of probabilities test is applied, or perhaps between 89% and 90% where the standard is “a very high probability”).⁸

(b) Under-deterrence results where the defendant’s activity (recurrently⁹) only adds to an independent background risk, and does not exceed it¹⁰ (where the balance of probabilities test is applied; the force of this criticism is even stronger if a higher standard of proof applies).

(c) There is a lack of sanction for fault/breach-of-duty in such a case because the defendant can continue a harmful and unreasonable activity without the threat of liability in tort (the “empty duty” argument).¹¹

(d) Alternatively, over-deterrence results if the defendant’s activity habitually more than doubles the background risk because the defendant will be made liable for more than the damage that is actually caused by his activity.¹²

In many legal systems, the weight of these considerations has been recognized through the development of a number of juridical techniques designed to alleviate the deficiencies of the orthodox approach.¹³ Some of these maintain the all-or-nothing outcome of the orthodox approach. These include the reversal of the burden of proof and the use of inferential evidence—for example, the recognition in France of “presumptions” (*présomptions graves, précises et concordantes*)¹⁴ or through the common

LAW FROM A GERMANIC PERSPECTIVE 140–41 (Fiona Salter Townshend trans., 2012); Helmut Koziol, *Comparative Conclusions*, in BASIC QUESTIONS OF TORT LAW FROM A COMPARATIVE PERSPECTIVE 685, 777–80 (Helmut Koziol ed., 2015).

8. For judicial recognition of this point in England, see Lord Nicholls’s dissenting opinion in *Gregg v. Scott* [2005] UKHL 2 [1]–[60], [2005] 2 AC 176 (Lord Nicholls of Birkenhead) (appeal taken from Eng.).

9. See generally Saul Levmore, *Probabilistic Recoveries, Restitution, and Recurring Wrongs*, 19 J. LEGAL STUD. 691 (1990).

10. Landes & Posner, *supra* note 7, at 424, 428; Levmore, *supra* note 9, at 698; Israel Gilead et al., *General Report: Causal Uncertainty and Proportional Liability: Analytical and Comparative Report*, in PROPORTIONAL LIABILITY: ANALYTICAL AND COMPARATIVE PERSPECTIVES, *supra* note 1, at 1, 37.

11. As to the empty duty argument, see *Fairchild v. Glenhaven Funeral Services Ltd.* [2002] UKHL 22 [62], [2003] 1 AC 32, (Lord Hoffmann) (appeal taken from Eng.); *Gregg v. Scott* [2005] UKHL 2 [4], [2005] 2 AC 176 (Lord Nicholls of Birkenhead) (appeal taken from Eng.); SANDY STEEL, *PROOF OF CAUSATION IN TORT LAW* 269 (2015); Donal Nolan, *Causation and the Goals of Tort Law*, in THE GOALS OF PRIVATE LAW ch. 7 (Andrew Robertson & Hang Wu Tang eds., 2009).

12. Gilead, *supra* note 10, at 37.

13. See *infra* Table 1 and discussion *infra* Part II.

14. See Duncan Fairgrieve & Florence G’sell-Macrez, *Causation in French Law: Pragmatism and Policy*, in PERSPECTIVES ON CAUSATION 111, 123–27 (Richard Goldberg ed., 2011).

law's doctrine of *res ipsa loquitur*.¹⁵ Other juridical techniques allow the successful claimant to recover only a proportion of his overall loss ("proportional liability"). The award of damages for loss of chance may be mentioned as a well-known example, as well as liability for materially contributing to risk and "market share" liability.

Table 1: Alternative Juridical Techniques

All or nothing		Proportional liability		
Reversed burden of proof	Use of inferential evidence	Damages for loss of chance	Damages for contribution to risk	Market share liability

As will be demonstrated below, the *ad hoc*, under-theorized recourse to such techniques—though remedying some of the injustice caused by the law's orthodox approach to causation—has also led to a measure of incoherence because such developments have not generally been based on a principled approach to fundamental issues. This article therefore aims (I) to set out a simple framework of principles within which legal responses can be gradated according to the merits of different categories of cases, and then (II) to apply that framework to a number of typical scenarios of uncertain causation.¹⁶

I. A PRINCIPLED FRAMEWORK FOR ANALYSIS

The *ad hoc* development of juridical techniques to solve problems of causal uncertainty has tended to obscure the fundamental issues of justice at stake. The scope or range of application of these techniques does not adequately distinguish the different categories of cases in which problems of causal uncertainty arise. What is needed therefore is a conceptual matrix that can be used to create a hierarchy of case categories that are then matched to the appropriate legal response, whether that be full liability, proportional liability, or no liability at all.

15. The seminal case in English law is *Scott v. London & St. Katherine Docks Co.* (1865) 3 H & C 596, 159 Eng. Rep. 665.

16. My approach is indebted to the conceptual analysis advanced by Israel Gilead et al., *supra* note 10, at 1. Their analysis is, however, based on a different categorization of typical cases. *Id.* at 10–17.

The approach elaborated here has two aspects, which may be termed (A) “ranking” and (B) “matching”.

A. “Ranking”

“Ranking” involves the development of an analytical framework that enables different categories of cases to be ordered according to a principled hierarchy. The criteria employed to affect this ranking express a few simple common-sense ideas:

First, looking at the justice of imposing liability on the defendant, even if it is not certain that the defendant tortiously caused damage to the claimant, liability may still be justified where it is certain that the defendant tortiously caused damage to *someone*, even if it is uncertain whether the claimant was the actual victim. Liability may also be imposed, though the case for it is less strong, where the defendant merely tortiously risked the causation of damage, and it is uncertain if this risk—rather than some independent risk—eventuated at all.

Conversely, looking at things from the claimant’s side, the claimant has a strong claim to receive damages when it is certain that he or she suffered tortious damage, even if it is uncertain by whom it was caused. The claimant may also be entitled to damages, though the case for their award is less strong, where he or she was tortiously put at risk of suffering damage, but it is uncertain if this was the risk that eventuated.

The case for liability is weakest where both causation and fault are uncertain—for example, where it is not known whether the defendant was responsible for some part of the tortious risk, and it is also not known whether the claimant was in fact exposed to the tortious risk rather than a background risk that may also have eventuated.

The interplay of these factors is illustrated by Table 2, *infra*, in which the considerations at the top of each column, addressing the respective perspectives of defendant and claimant, give the strongest reasons for imposing liability, but these reasons weaken progressively as one goes down each column.

Table 2.

The Defendant . . .	The Claimant . . .
. . . tortiously caused damage to the claimant.	. . . suffered tortious damage caused by the defendant.
. . . tortiously caused damage, but it is uncertain to whom.	. . . suffered tortious damage, but it is uncertain by whom.
. . . tortiously risked the causation of damage, but it is uncertain if this was the risk that eventuated.	. . . was tortiously put at risk of suffering damage, but it is uncertain if this was the risk that eventuated.
. . . may or not have been responsible for some part of the tortious risk.	. . . may or may not have been exposed to the tortious risk.

B. “Matching”

Using this hierarchy, it is possible to consider what *type* of outcome is appropriate for each distinct category of case: full liability, proportional liability or no liability.

Table 3.

Full liability	Proportional liability	No liability
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The argument advanced here is not that there is necessarily a “correct” outcome in any particular category of cases, but merely that it should be ensured, at a minimum, that the overall distribution of outcomes reflects the hierarchical ranking of the reasons favoring liability in each type of case. In principle, full liability should correspond to situations where the arguments in favor of liability are strongest; proportional liability should apply where the arguments in favor of liability, though less strong, are still significant;

and no liability may be the desirable outcome where the arguments in favor of liability are weaker still.

II. APPLICATION TO FOUR LIABILITY SCENARIOS

A. The Indeterminate Defendant

The first category is indeterminate defendants.¹⁷ In this scenario, the claimant (C) was wrongfully exposed to the risk of harm by two or more defendants (D1, D2, etc.¹⁸) each acting independently. The risk eventuates and C is injured. It is known that either D1 or D2 was the cause, but it cannot be proven on the balance of probabilities which of them actually caused the injury. This, of course, is the situation that is exemplified by the hunters case.¹⁹ An alternative illustration is employers' liability for mesothelioma following exposure to asbestos. Where the claimant was employed by several employers, each of whom exposed him tortiously to asbestos, it may not be possible to prove which exposure(s) triggered the cancer.²⁰

In such cases, it seems that most legal systems have an exceptional rule allowing liability, in some measure, to be pinned on each of the defendants.²¹ The reasons for doing so are strong, bordering on the overwhelming. On the one hand, the law is simply putting the claimant in the position he or she would have been had there been no tort at all; on the other hand, it merely imposes the cost on those who are proved to have acted wrongfully towards the claimant. The alternative is to leave the proven victim of tortious injury without any remedy at all, and to relieve the actual tortfeasor of responsibility simply because others behaved wrongfully towards the victim too.

A variety of juridical techniques are employed. One is the reversal of the burden of proof as found in the common law of the United States²² and Canada.²³ The same approach is adopted in the U.S. *Third Restatement of Torts: Liability for Physical and Emotional Harm*, which provides:

17. See generally John G. Fleming, *Mass Torts*, 42 AM. J. COMP. L. 507, 511 (1994).

18. The "etc." should be treated as implicit in what follows.

19. See *Summers v. Tice*, 199 P.2d 1 (Cal. 1948).

20. See *Fairchild v. Glenhaven Funeral Services Ltd.* [2002] UKHL 22, [2003] 1 AC 32 (appeal taken from Eng.). Obviously the issue does not arise in the same way in legal systems where workers' compensation displaces employers' liability.

21. See generally Oliphant, *Uncertain Factual Causation*, *supra* note 1, at 1603–04, 1611–16; 1 ESSENTIAL CASES ON NATURAL CAUSATION 353–89 (Bénédict Winiger et al. eds., 2007).

22. *Summers*, 199 P.2d at 1.

23. *Cook v. Lewis*, [1951] S.C.R. 830 (Can.).

When the plaintiff sues all of multiple actors and proves that each engaged in tortious conduct that exposed the plaintiff to a risk of harm and that the tortious conduct of one or more of them caused the plaintiff's harm but the plaintiff cannot reasonably be expected to prove which actor or actors caused the harm, the burden of proof . . . on factual causation is shifted to the defendants.²⁴

Turning to codified civil law, the German Civil Code has a specific provision to deal with alternative defendants through a reversed burden of proof:

§ 830 BGB. Joint tortfeasors, instigators and accessories (1)

Where several persons have caused a loss by acting jointly and unlawfully, each of them is responsible for the whole loss. The same applies where it cannot be ascertained which of several persons involved caused the loss by his conduct.²⁵

This has served as a model for code provisions elsewhere (e.g. Greece, the Netherlands, Slovenia, China, and Japan).²⁶

An alternative approach is to impose liability for material contribution to the risk of the damage occurring. This is the approach of English common law, which also allows the recognition of a causal link in such cases, but the resulting liability is proportional, not full liability.²⁷

Whether in such cases each defendant should bear full joint and several liability—e.g., through the application of a reversed burden of proof— or only a proportional liability—e.g., on the basis of each defendant's contribution to the risk—is open to debate. Full liability is certainly more justifiable in this scenario than in others—to be considered shortly—where it is not possible to show to the normal standard of proof that the claimant was the victim of *someone's* tort. If all the defendants can be traced and are solvent, the outcome is the same in any case: Either the claimant sues each of the defendants for proportional damages, and achieves full recovery by aggregating the sums thereby obtained, or the claimant recovers the full amount from a single defendant under a joint and several liability rule, and the defendant then recovers an indemnity from the other responsible parties.

24. RESTATEMENT (THIRD) OF TORTS § 28(2) (AM. LAW. INST. 2010).

25. BÜRGERLICHES GESETZBUCH [BGB] [CIVIL CODE], § 830, para. 1, translated in Jörg Fedtke & Florian Wagner-von Papp, *Germany*, in, EUROPEAN TORT LAW: BASIC TEXTS 122 (Ken Oliphant & Barbara C. Steininger eds., 2011).

26. See Oliphant, *Uncertain Factual Causation*, *supra* note 1, at 1611; MINPŌ [CIV. C.] art 719, para. 1 (Japan). A similar provision is also to be found in the Draft Common Frame of Reference (DCFR). PRINCIPLES, DEFINITIONS AND MODEL RULES OF EUROPEAN PRIVATE LAW: DRAFT COMMON FRAME OF REFERENCE (DCFR) bk. VI ch. 4 § 103 (Christian von Bar et al. eds., outline ed. 2008).

27. *Barker v. Corus (UK) plc* [2006] UKHL 20, [2006] 2 AC 572 (appeal taken from Eng.) (interpreting *Fairchild v. Glenhaven Funeral Services Ltd.* [2002] UKHL 22, [2003] 1 AC 32).

However, where one or more of the defendants is insolvent or cannot be traced, joint and several liability means that the entire loss may fall on a single defendant who, for purely practical reasons, is unable to recover any indemnity from the other(s) who also contributed to the tortious risk.²⁸ This might well be considered unfair, especially in situations where there is a large pool of claimants, as in many cases of toxic exposure at work or in the environment. A proportional liability rule means, by contrast, that the risk of insolvency amongst the defendants is borne by the claimant, which could also be considered unfair.

One way to reconcile these conflicting concerns would be to apply a rule of joint and several liability in indeterminate defendant cases, but at the same time to ease the burden on defendants—should that be deemed appropriate—by establishing a mutual indemnity fund to reimburse them for what they were in law entitled to collect from other responsible parties, but were precluded from obtaining for reasons of the latter's insolvency or untraceability. This is the approach under section 3 of the Compensation Act 2006 (United Kingdom), which imposes a liability *in solidum* for mesothelioma cases where liability rests on material contribution to risk: A defendant who cannot recover an indemnity from another responsible party is able to recover the outstanding sum from the Financial Services Compensation Scheme.²⁹

B. The Indeterminate Claimant

A contrasting scenario is that involving the indeterminate claimant.³⁰ Here, the situations of the parties are reversed: It is the defendant who is known to have caused tortious injury, and it is the identity of the victim that remains indeterminate. In this scenario, there is a class of injured persons, each of whom was tortiously endangered by the defendant, and *possibly* suffered injury thereby, in circumstances in which it can only be established on the evidence that one or more indeterminate members of the group was *actually* injured tortiously by the defendant. The alternative cause of injury is some innocent factor (“background risk”). Examples include environmental toxins that cause an increase in illness or mortality rates amongst those exposed to them in a particular place, and a defective pharmaceutical product that causes harmful side effects amongst those who

28. *Id.* at [89] (Lord Rodger of Earlsferry).

29. ALEXANDER HORNE AND AMELIA ASPDEN, HOUSE OF COMMONS LIBRARY, HOME AFFAIRS SECTION, MESOTHELIOMA: CIVIL CLAIMS 6 (2015) (UK).

30. *See generally* Fleming, *supra* note 17, at 513.

ingest it. For each victim, indistinguishable symptoms and outcomes might also have resulted from natural, or at least “innocent,” background factors.

The case for departing from the orthodox rules is less strong here than in the indeterminate defendant scenario, principally because it cannot be said that the imposition of liability serves to place the claimant in the position he or she would have been in had he or she not suffered tortious injury. It is not established on the evidence that the indeterminate claimant suffered any tortious injury at all; the injury could well have occurred anyway.

On the other hand, it may be considered undesirable to allow a defendant who exposed multiple persons to risk, and is proven to have caused tortious injury to one or more of them, to escape all liability for it. That would relieve the defendant from responsibility for an injury we believe she or he has caused (even if it cannot be pinned down to a particular victim) and would leave the duty of care owed in such cases empty of content—assuming the “added risk” is insufficient to allow causation to be established under the ordinary standard of proof.

However, if liability *is* admitted in such a case—by way of exception to the orthodox requirements—it seems necessary that it should be proportionate to the likelihood that the defendant was the cause of the harm in the individual case. Otherwise the defendant could end up paying for many times the loss that she or he has actually caused. That would in no way be justifiable in moral or ethical terms, and would seriously distort the defendant’s incentives to take precautions and engage in appropriate levels of activity.

C. Indeterminate Causal Links Within a Closed Group

To be distinguished from both scenarios discussed to this point is the situation where there are indeterminate causal links within what may be termed a “closed group.” This is defined by two characteristics. On the one hand, there exists a group of injured persons (*claimants*) whose injuries are known to have been caused tortiously, but it cannot be shown by which member of a group of possible defendants they were in fact caused. On the other hand, there exists a group of *defendants* who wrongfully exposed the claimants to the risk of the injury they sustained; it is known that each of them has injured at least one claimant, but it cannot be shown who injured whom. The causal links between the claimants and defendants are indeterminate.

This type of case might arise, for example, where several industrial defendants located in a particular place wrongfully release the same rare³¹ toxin into the environment, causing distinctive injuries that bear the “signature” of the toxin released. Alternatively, several pharmaceutical manufacturers distribute a drug that similarly causes distinctive injuries bearing the drug’s “signature,” but there is no way of telling whose drugs each patient took.

It would seem that the case for at least some liability is stronger here than in both scenarios previously discussed. The (different) considerations pointing in favor of liability in each of the preceding cases are combined here. We know both that (a) every claimant was the victim of a tortious injury, and (b) every defendant has caused some tortious injury. It seems unreasonable to exclude the claimants from compensation simply because they cannot identify the particular wrongdoer who caused their injuries, and to deny the liability of every defendant simply because we cannot be sufficiently sure which member of the claimant group each defendant actually injured.

Whether the liability should be all or nothing, or proportional, is perhaps more difficult. Under the well-known market-share theory, liability in one sub-category of such cases is proportional, as recognized in the seminal U.S. decision of *Sindell v. Abbott Laboratories*.³² Looking at things afresh and from first principles, however, may throw the appropriateness of proportional liability in this category of case into doubt. If there are indeed, as argued here, stronger arguments for departing from the orthodox requirements of proof in this scenario than in the simple case of indeterminate defendants, then one might argue for a liability at least as stringent as the full joint and several liability applied in the latter case in most legal systems.³³ To have a weaker liability (proportional rather than solidary) seems actually to be incoherent. This is borne out if one considers the various categories diagrammatically. One sees immediately that the reasons for imposing liability in the “closed group” scenario are stronger than those in the indeterminate defendant and indeterminate claimant scenarios.

31. It must be assumed that the toxin is not independently present in the environment.

32. *Sindell v. Abbott Labs.* 607 P.2d 924 (Cal. 1980).

33. See discussion *infra* Section II.B.

Table 4:

Category of Alternative Causation	C tortiously injured?	D tortiously injures?
1. Indeterminate Defendant	<i>Yes</i>	<i>Not proven</i>
2. Indeterminate Claimant	<i>Not proven</i>	<i>Yes</i>
3. Indeterminate Links in a Closed Group of Cs and Ds	<i>Yes</i>	<i>Yes</i>
4. Risks partly within the victim's sphere	<i>Not proven</i>	<i>Not proven</i>

D. Risks Partly Within "the Victim's Sphere"

The last of the four scenarios to be discussed is where the alternatives are between the defendant's tortious conduct and an innocent background risk. This is the last of the categories represented in Table 4 *supra*. This scenario arises where, for example, doctor D negligently fails to diagnose patient C's illness and C subsequently dies, with the medical evidence indicating that C would have had a less-than-even chance³⁴ of recovering if properly diagnosed and treated.

Alternatively, a defendant, D, negligently releases toxins into the environment in a particular place, and it is subsequently noted that illness and mortality rates there have increased; C is one of the victims, but it is not known whether the toxins were causal at all, or the increased illness and mortality were just statistical quirks. Should C recover, in either scenario, even though it cannot be proved on the orthodox approach that D caused C's injury?

The justification here for departing from the orthodox rules of proof is much weaker than in all the preceding scenarios. It cannot be said on the ordinary standard of proof either that C has suffered a tortious injury, or that D has caused one. Imposing liability neither puts C in the position we believe she or he would have been in had D acted with reasonable care, nor holds D responsible for an injury we believe she or he has caused (even if it cannot be pinned down to a particular victim). It seems undesirable to allow C, having failed to establish causation on an orthodox basis, to "have a second bite at the cherry" in the hope of succeeding, even if only in part, on

34. Or, where a standard of proof other than the preponderance of the evidence applies, whatever chance whose loss would enable the claimant to establish causation on that basis.

some alternative basis. That would be a case of “heads I win, tails you lose” (at least partly).³⁵

Yet, a number of factors may lead us to question the justice of applying the orthodox rules of proof in such cases: (a) large and arbitrary differences in outcome can result from small differences in probability (especially at the borderline between cases just under and just above the ordinary threshold, e.g., under a preponderance of the evidence rule, cases of 49% and 51% probability); (b) under-deterrence results where the defendant’s activity only adds to an independent background risk, and does not exceed it; (c) the lack of sanction for breach of duty in such a case (the “empty duty” argument); and (d) alternatively, the over-deterrence that results if the defendant’s activity habitually more than doubles the background risk.

These considerations may lead us to think again whether it is appropriate to stick with the orthodox all-or-nothing approach in all cases when its outcome in practice is no liability at all. In fact, several legal systems already admit exceptions to the orthodox rule in particular circumstances—for example, where a hospital patient’s condition is misdiagnosed and she or he receives the wrong treatment, thereby losing the chance of recovery provided by the correct treatment, or where a worker develops mesothelioma after being exposed to asbestos tortiously in the workplace and *non-tortiously* in the general environment.³⁶ These exceptions testify to a strong feeling across different legal traditions that the orthodox approach to proof of causation can produce injustice, as demonstrated by the developments discussed below.

An oft-used juridical technique in such cases is the award of damages for loss of chance (especially in medical cases). Damages for loss of chance are accepted, for example, in France, Japan, and a majority of U.S. states.³⁷

35. Cf. *Gregg v. Scott* [2005] UKHL 2 [224], [2005] 2 AC 176 (Baroness Hale): “[i]t would be a ‘heads you lose everything, tails I win something’ situation.”

36. As it appears to have been assumed was the situation in *Sienkiewicz v. Greif (UK) Ltd.* [2011] UKSC 10, [2011] 2 AC 229 (appeal taken from Eng.).

37. France: Cour d’appel [CA] [regional court of appeal] Grenoble, Oct. 24, 1962 (unpublished), RTD civ., 1963, 334 (Fr.); Cour de cassation [Cass.] [supreme court for judicial matters] civ, Dec. 14, 1965, Bull. civ. I, No. 541 (Fr.); Florence G’Sell-Macrez, *Medical Malpractice and Compensation in France: Part I: The French Rules of Medical Liability Since the Patients’ Rights Law of March 4, 2002*, 86 CHI.-KENT L. REV. 1093, 1114–15 (2011). For Japan, see Robert B Leflar, *The Law of Medical Misadventure in Japan*, 87 CHI.-KENT L. REV. 79, 95 (2012). For the United States, see the summary provided in *Matsuyama v. Birnbaum*, 890 N.E.2d 819, 828–29 (Mass. 2008) (discussing that 20 states and D.C. have accepted and 10 states have rejected the approach). English law, by contrast, has so far rejected liability for loss of chance in connection with physical injuries, e.g., in the context of medical negligence. *Hotson v. E. Berkshire Area Health Auth.* [1987] AC 750 (HL); *Gregg v. Scott* [2005] UKHL 2 [2005] 2 AC 176 (Lord Nicholls of Birkenhead) (appeal taken from Eng.).

The patient recovers damages for being deprived of the chance of recovering from the condition for which treatment was required—or at least of achieving an outcome better than that which eventuated—and the damages are proportionate to the chance lost.

A comparable outcome is achieved in other legal systems by deeming the defendant to have contributed to the harm to the extent of his or her contribution to *the risk* of the harm's occurrence, as illustrated in the context of clinical negligence in Austria,³⁸ and employers' liability for occupational exposure to asbestos in England and the Netherlands.³⁹ Proportional liability was also endorsed in the *Principles of European Tort Law*:⁴⁰

Alternative causes

(1) In case of multiple activities, where each of them alone would have been sufficient to cause the damage, but it remains uncertain which one in fact caused it, each activity is regarded as a cause to the extent corresponding to the likelihood that it may have caused the victim's damage.⁴¹

Uncertain causes within the victim's sphere

The victim has to bear his loss to the extent corresponding to the likelihood that it may have been caused by an activity, occurrence or other circumstance within his own sphere.⁴²

In some legal systems, by contrast, the mechanism adopted preserves an all-or-nothing outcome—for example, where there is a reversal of the burden of proof.⁴³ Yet, reversing the burden of proof merely *shifts* the inequities resulting from the all-or-nothing approach without actually reducing them. Further, in practice, it places the entire loss on the shoulders of a defendant who has not been shown to have tortiously injured anyone, for

38. Oberster Gerichtshof [OGH] [Supreme Court] Nov. 7, 1995, 4 Ob 554/95, https://www.ris.bka.gv.at/Dokument.wxe?Abfrage=Justiz&Dokumentnummer=JJT_19951107_OGH0002_0040OB00554_9500000_000 (Austria) (child suffocated by coiling of umbilical cord in womb).

39. Compensation Act 2006, c. 29, § 3 (UK) (reversing the decision in *Barker v. Corus* [2006] UKHL 20 in the specific context of mesothelioma); HR 31 maart 2006, ECLI:NL:HR:2006:AU6092 (Nefalit/Karamus) (Neth.).

40. EUROPEAN GROUP ON TORT LAW, PRINCIPLES OF EUROPEAN TORT LAW (2005), <http://www.egtl.org/Principles/index.htm>.

41. *Id.* art. 3:103.

42. *Id.* art. 3:106.

43. This is the typical approach of German law in cases of clinical negligence, though it is subject to somewhat restrictive conditions. Marc Stauch, *Medical Malpractice and Compensation in Germany*, 86 CHI.-KENT L. REV. 1139, 1154–56 (2011); Marc Stauch, *The 2013 German Patients' Rights Act—Codifying Medical Malpractice Compensation*, 6 J. EUR. TORT L. 85, 90–91 (2015). Also adopting an all-or-nothing approach, the Compensation Act 2006, c. 29, § 3 (UK), applying to mesothelioma claims only, produces the remarkable result that full liability may result where the defendant contributes only a little to the overall risk to which the claimant was exposed. *See, e.g., Sienkiewicz v. Greif* (UK) Ltd. [2011] UKSC 10 [4], [2011] 2 AC 229 (appeal taken from Eng.) (ruling that the defendant employer was liable for 100% of the claimant's loss in circumstances where 85% of her total exposure to asbestos was non-tortious environmental exposure and only 15% was attributable to the defendant's tort).

the benefit of a claimant who has not been shown to have been tortiously injured. The reasons for allowing any exception at all to the orthodox approach are much weaker than those applying in the three scenarios discussed above, and it seems that the liability should, therefore, be less stringent—or, at least, no more stringent. Proportional liability, in one form or another, thus seems preferable to the simple reversal of the burden of proof and to other mechanisms that preserve an all-or-nothing outcome—assuming any departure from the orthodox rules is to be permitted at all.

CONCLUSION

The short comparative survey undertaken in the previous paragraphs demonstrates very clearly that the development of a range of juridical techniques to address perceived problems of uncertain causation has often proceeded in an *ad hoc* and unprincipled fashion, without regard for overall coherence. This article has argued for a more principled legal approach in which the appropriate legal response (full liability, proportional liability, or no liability) is adopted on the basis of a ranking of the different categories of cases in which problems of causal uncertainty can arise. This ranking reflects the strength (or weakness) of the arguments in favor of the imposition of (at least some) liability even though the uncertainty in regards to causation prevents the ordinary standard of proof from being satisfied.

The results of the ranking exercise to some extent go against prevailing orthodoxy—at least as judged by the most common juridical techniques employed in various countries. According to the ranking adopted here, a *more stringent* liability is justified in the “closed group” category of cases, in which the market-share theory produces proportional liability, than in the category of indeterminate defendants, exemplified by the hunters case, where full liability on the basis of a reversed burden of proof is often applied. Conversely, where the potential causes include risks within the victim’s own “sphere,” the ranking suggests that the arguments in favor of an exception to the ordinary approach to proof of causation are at their weakest, which highlights the anomaly of preserving the all-or-nothing outcome for certain categories of such cases in some jurisdictions—for example, through a reversal of the burden of proof.

The argument here is not that there is necessarily a single “correct” outcome in any particular category of case, but merely that it should be ensured, at a minimum, that the overall distribution of outcomes reflects the hierarchical ranking of the reasons favoring liability in the various categories. Bearing this ranking in mind as the various juridical techniques are re-

examined and refined should facilitate the more coherent development of the law in this area in the future.