

Sommerville v. Union Carbide Corp.

United States Court of Appeals for the Fourth Circuit

January 29, 2025, Argued; August 18, 2025, Decided

No. 24-1491

Reporter

2025 U.S. App. LEXIS 21016 *; 2025 LX 384255

LEE ANN SOMMERVILLE, individually, and on behalf of all others similarly situated, Plaintiff — Appellant, v.

UNION CARBIDE CORPORATION; COVESTRO LLC, Defendants — Appellees. AMERICAN TORT REFORM ASSOCIATION; CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA, Amici Supporting Appellee.

Prior History: [*1] Appeal from the United States District Court for the Southern District of West Virginia, at Charleston. Joseph R. Goodwin, District Judge. (2:19-cv-00878).

Disposition: REVERSED AND REMANDED.

Core Terms

district court, plant, emission, exposure, medical monitoring, concrete, cancer, input, increased risk, future harm, speculative, reliable, clean, expert testimony, injury in fact, class member, diagnostic, expose, abuse of discretion, summary judgment, scientific, unreliable, disease, meteorological, methodology, manifest, estimate, credibility, gatekeeping, dispersion

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Judges: Before DIAZ, Chief Judge, WYNN, and BENJAMIN, Circuit Judges. Judge Benjamin wrote the opinion in which Judge Wynn joined. Chief Judge Diaz wrote a dissenting opinion.

Opinion by: DEANDREA GIST BENJAMIN

Opinion

DEANDREA GIST BENJAMIN, Circuit Judge:

Plaintiff Lee Ann Somerville appeals the district court's exclusion of her proposed expert, Dr. Ranajit Sahu, and its grant of summary judgment to Defendants **Union Carbide** Corporation and Covestro LLC for lack of standing. We now reverse.

I.

Sommerville, on behalf of herself and others similarly situated, sued Defendants **Union Carbide** Corporation and Covestro LLC (collectively "the Plant Owners") for alleged exposure to ethylene **oxide** ("EtO"), a gas that causes cancer. Somerville's lawsuit concerns a plant in South Charleston, West Virginia ("the Plant"), which **Union Carbide**, and then Covestro, operated between 1978 and 2019. Somerville alleges that the Plant

emitted EtO into the atmosphere, that she breathed this EtO, and that this exposure increased her risk of developing specific diseases. Sommerville alleges that she has a present need to manage this increased risk [*3] of illness through medical monitoring and diagnostic testing, and that the Plant Owners should foot the bill. Sommerville brought a single claim for medical monitoring under West Virginia common law.

Sommerville challenges two orders the district court issued. The first is an order excluding the opinions of her proffered expert, Dr. Sahu. The second is an order granting the Plant Owners summary judgment. Sommerville timely appealed and we have jurisdiction. [28 U.S.C. § 1291](#).

II.

The district court acknowledged that West Virginia law recognizes medical monitoring claims. Nevertheless, it held that because Sommerville lacked a "manifest" physical injury, she did not have Article III standing. If the district court is correct, then whether Dr. Sahu's testimony was erroneously excluded is beside the point. So we begin with standing. Our review is *de novo*. [White Tail Park, Inc. v. Stroube](#), 413 F.3d 451, 459 (4th Cir. 2005).

A.

In [Bower v. Westinghouse Electric Corp.](#), 522 S.E.2d 424 (W. Va. 1999), the Supreme Court of Appeals of West Virginia recognized common law claims for medical monitoring. [Id. at 431](#). Plaintiffs bringing medical monitoring claims seek "to recover the anticipated costs of long-term diagnostic testing necessary to detect latent diseases that may develop as a result of tortious exposure to toxic substances." [Id. at 429](#). The tort is a "well-grounded extension [*4] of traditional common-law tort principles." See *id.*; see also *id.* n.5 (collecting cases).¹

Medical monitoring claims originate from the traditional common law principle that individuals have "legally protected interest[s] in avoiding physical injury." See [Bourgeois v. A.P. Green Indus., Inc.](#), 716 So. 2d 355, 359 (La. 1998); [Bower](#), 522 S.E.2d at 429-30. Medical

monitoring claims apply this principle to injuries where there is no visible "impact." [Bourgeois](#), 716 So. 2d at 358 (noting that "modern environmental toxins[] affect[] the body in ways that often do not become manifest for many years") (citing [Hansen v. Mountain Fuel Supply](#), 858 P.2d 970, 977 (Utah 1993)). "[T]he exposure *itself* and the concomitant *need* for medical testing constitute the injury." [Bower](#), 522 S.E.2d at 430 (cleaned up and emphasis added) (citing [Hansen](#), 858 P.2d at 977).

Medical monitoring claims concern exposure to "hazardous substance[s]" like "asbestos" or, in this case, EtO and, by their nature, occur "without impact." See [Bourgeois](#), 716 So. 2d at 358 ("Unlike a car crash, asbestos exposure is an accident almost always without impact."). The fact that exposure to a contaminant happens invisibly—so to speak—does not sever the tort from its common law roots. The exposure "is still an accident that can have consequences every bit as real as those sustained in a head-on collision. In fact, it is precisely because asbestos—or EtO—"can have such deadly consequences [*5] that plaintiffs, regardless of whether or not they are currently suffering from a disease, are often encouraged to submit to regular diagnostic testing." See [id. at 358-59](#).

Put simply, "an individual has an interest in avoiding expensive diagnostic examinations just as he or she has an interest in avoiding physical injury." [Friends for All Child., Inc. v. Lockheed Aircraft Corp.](#), 746 F.2d 816, 826 (D.C. Cir. 1984). "When a defendant negligently invades this interest, the injury to which is neither speculative nor resistant to proof, it is elementary that the defendant should make the plaintiff whole by paying for the examinations." *Id.*; [Bower](#), 522 S.E.2d at 430 (quoting [Friends for All Child.](#), 746 F.2d at 826, for this proposition). Or in *Bower's* own words, "[a]lthough the physical manifestations of an injury may not appear for years, the reality is that many of those exposed have suffered [a] legal detriment; the exposure itself and the concomitant need for medical testing constitute the injury." 522 S.E.2d at 430 (quoting [Hansen](#), 858 P.2d at 977).

Given the injury's nature—tortious exposure to a known hazardous substance whose effects won't appear for years but for which expensive medical testing is required today—*Bower* "reject[ed] the contention that a claim for future medical expenses must rest upon the existence of present physical harm." *Id.* *Bower* quoted at length from *Friends for All Children* to support this conclusion. See 522 S.E.2d at 430-31. We do too:

Jones is knocked down by a motorbike which Smith

¹ Because [Bower v. Westinghouse Electric Corp.](#), 522 S.E.2d 424 (W. Va. 1999), does not articulate explicitly the common law principles from which West Virginia's medical monitoring claim grew, we rely on [Bourgeois v. A.P. Green Industries, Inc.](#), 716 So. 2d 355 (La. 1998), one of the cases which *Bower* cited.

is riding through a red light. Jones lands on his head with some force. Understandably shaken, Jones enters a hospital where doctors recommend that he undergo a battery of tests to determine whether he has suffered any internal head injuries. The tests prove negative, but Jones sues Smith solely for what turns out to be the substantial cost of the diagnostic examinations.

...

[In such circumstances] it is clear that even in the absence of physical injury Jones ought to be able to recover the cost for the various diagnostic examinations proximately caused by Smith's negligent action. A cause of action allowing recovery for the expense of diagnostic examinations recommended by competent physicians will, in theory, deter misconduct, whether it be negligent motorbike riding or negligent aircraft manufacture. The cause of action also accords with commonly shared intuitions of normative justice which underlie the common law of tort. The motorbike rider, through his negligence, caused the plaintiff, in the opinion of medical experts, to need specific medical services—a cost that is neither [*7] inconsequential nor of a kind the community generally accepts as part of the wear and tear of daily life. Under these principles of tort law, the motorbiker should pay.

Friends for All Child., 746 F.2d at 825. Bower explicitly adopted this logic. 522 S.E.2d at 430-31.

Last, Bower articulated the elements required to state a medical monitoring claim. To succeed on a medical monitoring claim, a plaintiff must prove

- (1) he or she has, relative to the general population, been significantly exposed; (2) to a proven hazardous substance; (3) through the tortious conduct of the defendant; (4) as a proximate result of the exposure, plaintiff has suffered an increased risk of contracting a serious latent disease; (5) the increased risk of disease makes it reasonably necessary for the plaintiff to undergo periodic diagnostic medical examinations different from what would be prescribed in the absence of the exposure; and (6) monitoring procedures exist that make the early detection of a disease possible.

Id. at 432-33.

B.

We turn to the district court's standing decision. The

district court correctly recognized that Sommerville sought monetary relief to pay for the future cost of medical monitoring. And because Sommerville sought damages—not injunctive relief—the [*8] district court also correctly concluded that Sommerville must show a "present injury." See *Sommerville v. Union Carbide Corp.*, No. 2:19-CV-00878, 2024 WL 2139394, at *6 (S.D.W. Va. May 13, 2024) (hereinafter *Sommerville II*); *TransUnion LLC v. Ramirez*, 594 U.S. 413, 441 (2021) ("[T]he risk of future harm on its own does not support Article III standing for the plaintiffs' damages claim.").

At this point, however, and as we explain later, the district court's analysis went off course. It framed Sommerville's injury as an increased risk of "eventually getting cancer." *Sommerville II*, 2024 WL 2139394, at *7 ("Here, [Sommerville] seeks monetary damages based on the premise that because [the Plant Owners] emit EtO into the air and she, in turn, breathes that air, [the Plant Owners] have put her and proposed class members at higher risk of eventually getting cancer."); *id.* at *8 ("[H]er claim is based entirely on the unsubstantiated possibility of a future cancer diagnosis."). Then, relying on *TransUnion LLC v. Ramirez*, 594 U.S. 413 (2021), the district court concluded that because the "possibility of [a] future cancer diagnosis" was not "concrete," and because Sommerville did not have a present physical injury, Sommerville lacked Article III standing. See *id.* at *7-8 ("The Supreme Court's holding in *TransUnion* makes clear to me that claims for medical monitoring seeking damages without a manifest injury do not satisfy the injury-in-fact requirement for [*9] Article III standing.") (footnote omitted). The district court likewise held that Sommerville's claim was not "ripe" because "not one of [her] experts can say with any level of certainty that [Sommerville] . . . will develop cancer from [the Plant Owners'] actions." *Id.* at *11.

C.

Article III of the Constitution limits the jurisdiction of federal courts to actual "cases" or "controversies." *U.S. Const. art. III, § 2*. Thus, it is a jurisdictional requirement that litigants be parties to a live case or controversy. This standing requirement "is an essential and unchanging part of the case-or-controversy requirement of Article III." *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560 (1992) (citing *Allen v. Wright*, 468 U.S. 737, 751 (1984)).

To establish standing, a party must establish, as "the irreducible constitutional minimum," three elements: (1)

that it has suffered an "injury in fact" that is both "concrete and particularized" and "actual or imminent, not conjectural or hypothetical"; (2) that there is "a causal connection between the injury and the conduct complained of," i.e., the injury is "fairly traceable" to the challenged action; and (3) that it is "likely, as opposed to merely speculative, that the injury will be redressed by a favorable decision." *Id.* at 560-61 (internal quotation marks and citations omitted); *Burke v. City of Charleston*, 139 F.3d 401, 405 (4th Cir. 1998). As to ripeness, "[t]he doctrine . . . prevents judicial [*10] consideration of issues until a controversy is presented in clean-cut and concrete form." *Scoggins v. Lee's Crossing Homeowners Ass'n*, 718 F.3d 262, 270 (4th Cir. 2013) (noting a case is ripe "when the action in controversy is final and not dependent on future uncertainties") (quoting *Miller v. Brown*, 462 F.3d 312, 319 (4th Cir. 2006)).

TransUnion addressed "the Article III requirement that the plaintiff's injury in fact be concrete" in the context of a class action. 594 U.S. at 424 (cleaned up). The named plaintiff in that case brought a class action, alleging that TransUnion, a credit reporting agency, had violated the Fair Credit Reporting Act by failing to use reasonable procedures before placing a misleading alert in his credit file that labeled him as a potential terrorist, drug trafficker, or serious criminal. *Id.* at 419-21. He also asserted two claims based on TransUnion's having sent him two mailings that did not comply with certain formatting requirements imposed by the statute. *Id.* at 421-22.

The district court certified a class of more than 8,000 people who had the same misleading alert added to their credit files and who had also received similar mailings during a certain time period. A jury then awarded each class member statutory and punitive damages, and the Ninth Circuit largely affirmed the judgment. *Id.* at 422.

The Supreme Court reversed and remanded, holding that only [*11] a subset of the class had established Article III standing to sue TransUnion for its failure to use reasonable procedures to ensure the accuracy of their credit files—namely, the 1,853 class members whose credit reports had been provided to third-party businesses and who had suffered "concrete reputational harm" as a result. *Id.* at 417. With respect to the two claims relating to the formatting defects in the mailings, the Court held that no class member other than the named plaintiff had demonstrated any concrete harm caused by the formatting errors, such that only he had

standing to recover on those claims. *Id.* at 418.

In explaining its decision, the Court emphasized that, "under Article III, an injury in law is not an injury in fact" and that "[o]nly those plaintiffs who have been *concretely harmed* by a defendant's statutory violation may sue that private defendant over that violation in federal court." *Id.* at 427. Put simply, "[n]o concrete harm, no standing." *Id.* at 417. The Court explained that while "[t]he most obvious" concrete injuries are "tangible harms, such as physical harms and monetary harms," "[v]arious intangible harms can also be concrete," depending on whether they have "a close relationship to harms traditionally recognized [*12] as providing a basis for lawsuits in American courts." *Id.* at 425.

Then, the Court applied those principles to class actions, observing that "standing is not dispensed in gross." *Id.* at 431. It emphasized that federal courts lack "the power to order relief to any uninjured plaintiff, class action or not." *Id.* (quoting *Tyson Foods, Inc. v. Bouaphakeo*, 577 U.S. 442, 466 (2016) (*Roberts, C.J., concurring*)). As a result, "[e]very class member must have Article III standing in order to recover individual damages." *Id.* Moreover, "plaintiffs must demonstrate standing for each claim that they press and for each form of relief that they seek." *Id.*

Finally, the Court also made clear that the form of relief sought matters when assessing the sufficiency of the alleged harm. Thus, while "a person exposed to a risk of future harm may pursue forward-looking, injunctive relief to prevent the harm from occurring," *id.* at 435, "the risk of future harm on its own does not support Article III standing for [a] damages claim," *id.* at 441.

Applying these principles to the facts before it, the Court held that the approximately 6,300 class members who failed to prove that the misleading alerts in their credit reports were ever provided to a third party "did not suffer a concrete harm," as necessary for them to recover damages for the reasonable procedures [*13] claim. *Id.* at 439. The Court rejected the argument that those class members had "suffered a concrete injury for Article III purposes because the existence of misleading . . . alerts in their internal credit files exposed them to a *material risk* that the information would be disseminated in the future to third parties and thereby cause them harm." *Id.* at 435 (emphasis added) (noting plaintiffs, despite seeking damages, tried to demonstrate standing under the standard applicable to injunctive relief).

And it was also unpersuaded by the plaintiffs' argument

that it could infer that those class members' credit reports "were likely also sent to third parties . . . because all of the class members [had] requested copies of their reports, and consumers usually do not request copies unless they are contemplating a transaction that would trigger a credit check." *Id.* at 438-39. Rejecting that contention, the Court reasoned that "[t]he plaintiffs had the burden to prove at trial that their reports were actually sent to third-party businesses" and that "[t]he inferences on which the argument rests are too weak to demonstrate that the reports of any particular [class member were] sent to third-party businesses." *Id.* at 439.

Finally, the Court [*14] concluded that, other than the named plaintiff, none of the class members had "demonstrated that the format of TransUnion's mailings"—even if not in compliance with the statute—caused them "any harm *at all*," let alone "a harm with a close relationship to a harm traditionally recognized as providing a basis for a lawsuit in American courts." *Id.* at 440.

In sum, *TransUnion* stands for the proposition that "a plaintiff does not 'automatically satisf[y] the injury-in-fact requirement' whenever a statute [or state common law] . . . 'grants a person a [] right and purports to authorize that person to sue to vindicate that right.'" See *Fernandez v. RentGrow, Inc.*, 116 F.4th 288, 294 (4th Cir. 2024) (quoting *TransUnion*, 594 U.S. at 426). Article III requires a "concrete injury." *Id.* (quoting *Spokeo, Inc. v. Robins*, 578 U.S. 330, 341 (2016)). "Accordingly, '[o]nly those plaintiffs who have been *concretely harmed* by a defendant's statutory violation [or tortious act] may sue that private defendant over that violation in federal court.'" See *id.* (quoting *TransUnion*, 594 U.S. at 427).

D.

i.

We reverse the district court's order granting the Plant Owners summary judgment. Sommerville has Article III standing.

To begin, the district court misstated the harm for which medical monitoring plaintiffs like Sommerville seek recovery. Sommerville's alleged injury is not an "increased risk of [*15] cancer development due to the alleged EtO emissions." *Sommerville II*, 2024 WL 2139394, at *7. Sommerville's injury is her "exposure *itself*" to "environmental toxins" tortiously emitted by the Plant Owners, "[which] affect the body in ways that often do not become manifest for several years" and "the

concomitant need [to pay] for medical testing" *today* to mitigate an increased risk of illness which Sommerville would not bear but for the Plant Owners' actions. See *Bower*, 522 S.E.2d at 430 (emphasis added); *Bourgeois*, 716 So. 2d at 358 (cleaned up); *Friends for All Child.*, 746 F.2d at 825 ("The [tortfeasor], through his negligence, caused the plaintiff, in the opinion of medical experts, to need specific medical services—a cost that is neither inconsequential nor of a kind the community generally accepts as part of the wear and tear of daily life. Under these principles of tort law, the [tortfeasor] should pay."). Framed properly, Sommerville's injury is concrete and ripe.

Sommerville alleges that the Plant Owners wrongfully exposed her to EtO in such great quantities that her chance of contracting a serious latent disease increased to the point that she must, in a qualified physician's opinion, pay for and undergo periodic diagnostic medical examinations *now*. See *Bower*, 522 S.E.2d at 433. West Virginia law permits Sommerville to seek [*16] recovery for this harm, which is grounded in the "traditional common-law principle[]" of "avoiding physical injury." *Bourgeois*, 716 So. 2d at 359; *Bower*, 522 S.E.2d at 429-30; see *TransUnion*, 594 U.S. at 424-25. Sommerville might not have a visible injury like a broken arm, but this does not make her injury any less actual, concrete, or serious. See *Bourgeois*, 716 So. 2d at 358 (observing that "asbestos exposure is an accident almost always without impact. Nevertheless, it is still an accident that can have consequences every bit as real as those sustained in a head-on collision").

Lest there be any doubt that the injury requisite to bring a medical monitoring claim is not merely "conjectural," *Sommerville II*, 2024 WL 2139394, at *8, the Supreme Court of Appeals of West Virginia has emphasized that the six *Bower* factors "establish[] an extremely high bar for a plaintiff to overcome before there can be any recovery for medical monitoring." *In re Tobacco Litig.*, 600 S.E.2d 188, 194 (W. Va. 2004). These factors require Sommerville to demonstrate such significant exposure to a hazardous substance as to render monitoring a present medical necessity. This injury is actual and concrete. So, Sommerville has Article III standing.

The Plant Owners' principal argument for affirming the district court's grant of summary judgment is unconvincing. The Plant Owners contend that the district court *didn't* [*17] hold that medical monitoring plaintiffs without a manifest physical injury always lack Article III standing. Appellees' Br. (ECF No. 24) at 53

("[Sommerville] argues against a strawman she puts forth—that the District Court decided that no medical-monitoring plaintiff could ever have Article III standing at any stage of litigation."). Instead, the Plant Owners insist that the district court granted them summary judgment because Sommerville "lacked admissible evidence [of] her exposure." *Id.* at 56 (arguing that the district court's exclusion, by prior order, of Dr. Sahu's testimony left Sommerville without evidence of exposure to EtO). This argument is counterfactual.²

The district court explicitly ruled that Sommerville lacked an actual injury because "[t]he Supreme Court's holding in *TransUnion* ma[d]e[] clear to [it] that claims for medical monitoring seeking damages without a manifest injury do not satisfy the . . . requirement[s] for Article III standing." See *Sommerville II*, 2024 WL 2139394, at *7. As explained above and as we reiterate here, this conclusion—along with the factual assertions on which it rested—was wrong.

Sommerville's claim is not that the Plant Owners' EtO emissions *may* have harmed her by putting [*18] her "at a higher risk of eventually getting cancer." *Sommerville II*, 2024 WL 2139394, at *7; see *TransUnion*, 549 U.S. at 435 (rejecting argument that roughly 6,300 class members had "suffered a concrete injury for Article III purposes because the existence of misleading . . . alerts in their internal credit files exposes them to a material risk that the information w[ill] be disseminated in the future to third parties and thereby cause them harm"). Rather, Sommerville's injury is that the Plant Owners exposed her to EtO in such quantities that she must, in a qualified physician's opinion, pay for and undergo periodic diagnostic medical examinations *now*. This injury is no less concrete than the injury suffered by the 1,853 class members in *TransUnion* whose credit

reports had *actually* been provided to third-party businesses and who had suffered "concrete reputational harm." See *TransUnion*, 549 U.S. at 417.

ii.

The dissent frames Sommerville's injury like the district court—as an increased risk of "develop[ing] cancer." See Diss. Op. at 31 ("Sommerville claims that she's at an increased risk of developing cancer and that the risk creates a present need for medical monitoring. . . . Though the future harm here—cancer—is serious, it's certainly not impending. The record doesn't show [*19] who in the putative class (if anyone) will develop cancer or when (if ever)."). Then, relying on *Beck v. McDonald*, 848 F.3d 262 (4th Cir. 2017), it concludes Sommerville's injury is too speculative to establish Article III standing. Diss. Op. at 30-31.

In *Beck*, the plaintiffs sued Department of Veterans Affairs officials after their medical records were stolen from a Veterans Affairs medical center. The plaintiffs sought damages for two injuries: (1) the "increased risk of future identity theft" and (2) "credit monitoring services." *Id.* at 273, 276. The court held that both injuries were "too speculative" to confer Article III standing. See *id.* at 274; *id.* at 276 (holding second injury was "a repackaged version" of the first and that plaintiffs could not establish standing by seeking "costs they incurred in response to a speculative threat") (cleaned up).

In holding that the plaintiffs' claims were too speculative, *Beck* emphasized the "attenuated chain of possibilities" that the plaintiffs relied on to establish their injury. *Id.* at 275 (quoting *Clapper v. Amnesty Intern. USA*, 568 U.S. 398, 410 (2013)). This chain included "assum[ing] that the thief targeted the stolen items for the personal information they contained. And . . . [that] the thieves select[ed], from thousands of others, the personal information of the named plaintiffs *and* attempt[ed] [*20] successfully to use that information to steal their identities." *Id.* (emphasis added).

Here, *Beck* is inapposite. Sommerville's alleged injury does not rest on an "attenuated chain of possibilities." Nor does it rest on an unknown third party's actions. It exists *already*. Her injury is a present physical one—"exposure *itself*" to "environmental toxins" the Plant Owners tortiously emitted and "the concomitant need [to submit to and pay] for medical testing" *today* to mitigate an increased risk of illness. See *Bower*, 522 S.E.2d at 430 (emphasis added). Put differently, Sommerville is not suing about a "speculative threat" that depends on a

² Having previously excluded Dr. Sahu's testimony, the district court could have granted the Plant Owners summary judgment against Sommerville not for "lack of standing," but for want of necessary evidence. See *Sommerville v. Union Carbide Corp.*, No. 2:19-CV-00878, 2024 WL 2139394, at *12 n.7 (S.D.W. Va. May 13, 2024) (noting that "if [the district court] had to proceed to the merits of the action," it would have granted the Plant Owners summary judgment due to Sommerville's failure to meet *Bower*'s first element). The district court, however, granted summary judgment based on standing. Further, even if the district court had granted the Plant Owners summary judgment for failure to meet *Bower*'s first element, that conclusion would have been erroneous—as explained in Section III, Dr. Sahu's testimony was wrongfully excluded.

third party's future acts. [Beck, 848 F.3d at 277](#) (cleaned up). She is suing about her current need for "specific medical services—a cost that is neither inconsequential nor of a kind the community generally accepts as part of the wear and tear of daily life." [Friends for All Child., 746 F.2d at 825](#). At bottom then, like the district court, the dissent misapprehends both the nature and immediateness of the harm for which Sommerville seeks redress.

* * *

For the reasons stated above, we hold that plaintiffs properly alleging the elements of West Virginia's medical monitoring tort have Article III standing. Sommerville has done so, and we reverse the [*21] district court's order granting the Plant Owners summary judgment for lack of standing.

III.

We now address the district court's exclusion of Sommerville's proposed expert Dr. Sahu.

A.

Under [Fed. R. Evid. 702](#), trial judges act as gatekeepers to "ensure that any and all scientific testimony . . . is not only relevant, but reliable." [Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579, 588 \(1993\)](#). While "Rule 702 was intended to liberalize the introduction of relevant expert evidence . . . court[s] must recognize that due to the difficulty of evaluating their testimony, expert witnesses have the potential to 'be both powerful and quite misleading.'" [Westberry v. Gislaved Gummi AB, 178 F.3d 257, 261 \(4th Cir. 1999\)](#) (quoting [Daubert, 509 U.S. at 595](#)) (internal citation omitted). Therefore, a trial judge, faced with a proffer of expert scientific testimony, must conduct "a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." [Daubert, 509 U.S. at 592-93](#). The proponent of the testimony must establish its admissibility by a preponderance of proof. See [id. at 592 n. 10](#) (citing [Bourjaily v. United States, 483 U.S. 171, 175-76 \(1987\)](#)); [Fed. R. Evid. 702](#).

In [Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 \(1993\)](#), the Supreme Court identified several factors that may bear on a judge's determination of the reliability of an expert's testimony. See [509 U.S. at 592-94](#). Those factors include: (1) whether a theory [*22] or technique can be or has been tested; (2) whether it has

been subjected to peer review and publication; (3) whether a technique has a high known or potential rate of error and whether there are standards controlling its operation; and (4) whether the theory or technique enjoys general acceptance within a relevant scientific community. See [id. at 592-94](#).

In [Kumho Tire Co. v. Carmichael, 526 U.S. 137 \(1999\)](#), the Supreme Court noted that the factors discussed in [Daubert](#) were neither definitive, nor exhaustive. [Id. at 150-51](#). The Court explained that particular factors may or may not be pertinent in assessing reliability, "depending on the nature of the issue, the expert's particular expertise, and the subject of his testimony." See [id.](#) The Court further emphasized that the objective of [Daubert's](#) gatekeeping requirement is to "make certain that an expert . . . employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." See [id. at 152](#).

Courts of appeals apply an abuse of discretion standard when reviewing a trial court's decision to admit or exclude expert testimony. See [Gen. Elec. Co. v. Joiner, 522 U.S. 136, 138-39 \(1997\)](#). The Supreme Court also has emphasized that "the trial judge must have considerable leeway in deciding in a particular case how to [*23] go about determining whether particular expert testimony is reliable." See [Kumho Tire, 526 U.S. at 152](#).

B.

To establish liability, Sommerville acknowledges that she must put forth admissible expert testimony to establish *Bower's* first element—that she was, relevant to the general population, "significantly exposed" to a proven hazardous substance. [522 S.E.2d at 432-33](#). Accordingly, Sommerville offered Dr. Sahu to testify about the fate and transport of the Plant's EtO emissions between 1984 and 2019. Dr. Sahu sought to provide "technical expertise, analysis, methodology, and opinions regarding various environmental and pollutant fate and transport issues relating to emissions of [EtO] from [the Plant] . . . to ultimately determine the potential exposure levels of [Sommerville] and the proposed class members." [Sommerville v. Union Carbide Corp., No. 2:19-CV-00878, 2024 WL 1204094, at *2 \(S.D.W. Va. Mar. 20, 2024\)](#) (hereinafter *Sommerville I*).

Dr. Sahu modeled EtO emissions using the "AERMOD" dispersion model, a computer program. J.A. 524. Before running AERMOD, however, Dr. Sahu had to select the inputs AERMOD would use to generate his EtO

modeling. These inputs included source data³, receptor data⁴, and meteorological data. J.A. 524.

The district court excluded Dr. Sahu's proposed testimony. For a plethora of supposedly independently-sufficient [*24] reasons, the district court found Dr. Sahu's testimony was unreliable. The district court did not question AERMOD itself but took issue with Dr. Sahu's choice of source and meteorological data.

First, the district court found that Dr. Sahu's choice of source parameters rendered his report unreliable. [Sommerville I, 2024 WL 1204094, at *10](#). To set his source parameters, Dr. Sahu relied on data the West Virginia Department of Environmental Protection created. Further, for the years 1985-1989, Dr. Sahu modeled all emissions as fugitive. The district court faulted Dr. Sahu for these choices, holding that both decisions were based on "assumptions . . . with little to no scientific basis." [Id. at *11](#).

Excluding Dr. Sahu for these choices was an abuse of discretion. Dr. Sahu presented detailed reasons for his challenged assumptions. See, e.g., *id.* (acknowledging Dr. Sahu's assertion that the Plant Owners' lack of record keeping limited Dr. Sahu's choice of "site-specific data to base his model on"); J.A. 514 (explaining why Dr. Sahu chose to model all Plant emissions as fugitive for 1985-1989); [id. 568](#) (further explaining Dr. Sahu's modeling choices and assumptions as to fugitive emissions). The district court, however, simply ignored or discounted [*25] Dr. Sahu's proffered explanations in favor of those that the Plant Owners' expert, Dr. Ranjit Machado, offered. See [Sommerville I, 2024 WL 1204094, at *10-11](#).

³ Source data means EtO "emissions sources" including "specification and locations of source units, historical emissions rates, and source parameters." J.A. 524. "Source parameters" are details describing the locations from which EtO was omitted. [Id. 525](#). "Point source" or "stack emissions" are "air releases that occur through identifiable confined air streams, such as stacks, ducts or pipes." [Sommerville v. Union Carbide Corp., No. 2:19-CV-00878, 2024 WL 1204094, at *10 n.5 \(S.D.W. Va. Mar. 20, 2024\)](#) (cleaned up). And "fugitive emissions" are "releases to air that don't occur through a confined air stream" such as via "equipment leaks." *Id.*

⁴ The AERMOD model allows the user to input a set of receptors, which are locations at which the model will predict hourly concentrations due to the input source emissions." J.A. 526.

At bottom, the district court's analysis was not a true critique of Dr. Sahu's "methodology," but a veiled credibility determination based on Dr. Sahu's choice of which data to input into his model. This was an abuse of discretion because "questions regarding the factual underpinnings of the [expert witness'] opinion affect the weight and credibility of the witness' assessment, not its admissibility." See [Bresler v. Wilmington Tr. Co., 855 F.3d 178, 195 \(4th Cir. 2017\)](#) (cleaned up); [Rappuhn v. Primal Vantage Co., No. 23-10050, 2024 WL 2930448, at *4 \(11th Cir. June 11, 2024\)](#) ("[C]rediting one expert over another . . . misapplies *Daubert* and intrudes on the province of the jury.").

Second, the district court found Dr. Sahu's testimony was unreliable because he did not "validate" **Union Carbide's** self-reported emissions data before inputting them into AERMOD. [Sommerville I, 2024 WL 1204094, at *12-13 \(Union Carbide self-reported 1984 data\); id. at *13-14 \(Union Carbide self-reported data 1990-2019\)](#). The district court did not cite controlling case law imposing a "validation" requirement. Nor did it explain, in practical terms, *how* Dr. Sahu was supposed to undertake "validation."

Excluding Dr. Sahu for failing to "validate" his data was a glaring abuse of discretion. Nothing in Rule 702 [*26] requires an expert witness to "validate" data. [Fed. R. Evid. 702](#). The district court's requirement that Dr. Sahu do just that, however, was extratextual, an error of law, and thus an abuse of discretion per se. See [New York City Transit Auth. v. Express Scripts, Inc., 588 F. Supp. 3d 424, 445 \(S.D.N.Y. 2022\)](#) (rejecting argument that expert failed to validate data and noting "the [c]ourt has not found[] precedent requiring experts to validate the data underlying each source on which they rely in order to satisfy the reliability threshold for admissibility"); see also [Daubert, 509 U.S. at 596](#) ("Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.").

Said differently, the district court again disagreed with Dr. Sahu's choice of data and excluded Dr. Sahu's testimony as a result, even though our caselaw forbids as much. See [Baxter v. Comm'r of I.R.S., 910 F.3d 150, 158 \(4th Cir. 2018\)](#) (affirming admission of expert and rejecting challenge to his selection of certain data finding that "to the extent that Taxpayers[] disagree with Kolbe's estimates of the costs of obtaining a 'good' or 'normal' loan, 'such challenges . . . affect the weight and credibility of [Kolbe's] assessment, not its admissibility'").

(citing [Bresler, 855 F.3d at 196](#)).

The district court made further related errors concerning its critique of Dr. Sahu's emissions data selections. For the year 1984, Dr. Sahu relied on data [Union Carbide](#) reported to the West Virginia Air Pollution Control Commission. When [Union Carbide](#) reported this data to authorities, it included a letter claiming its figures should not be taken at face value because they were "drastically overstated." [Sommerville I, 2024 WL 1204094, at *12](#). In the district court's [*27] opinion, because [Union Carbide](#) had cast doubt on its own data, Dr. Sahu's use of the data rendered his opinion unreliable.

This conclusion was an abuse of discretion for two reasons. First, Dr. Sahu provided reasons for why he did not believe [Union Carbide's](#) claim that its 1984 data were inaccurate. Second, and more fundamentally, excluding Dr. Sahu on this basis again violated [Bresler's](#) holding that "questions regarding the factual underpinnings of the [expert witness] opinion affect the weight and credibility of the witness' assessment, not its admissibility." See [Bresler, 855 F.3d at 195](#) (cleaned up).

The district court committed a similar error when it held that Dr. Sahu's report was unreliable because of the data Dr. Sahu based emissions on for the years 1985-1989. For this period, Dr. Sahu based EtO emissions on the "Toxic Air Pollutant Facility Registration Summary Sheets" the Plant Owners provided to regulatory authorities. The district court took issue with this choice because it believed that the "values listed [on the summary sheets were] estimates for maximum toxic air pollutant emissions, not *actual* emissions." [Sommerville I, 2024 WL 1204094, at *13](#) (cleaned up). The district court, however, ignored Dr. Sahu's testimony justifying [*28] his contrary interpretation of the summary sheets.

While Dr. Machado argued that the summary sheets were only potential emissions, Dr. Sahu testified that the "substantial variation" over time in the reported figures led him to infer [Union Carbide](#) was reporting actual emissions. J.A. 261-62. Such a "factual dispute is best settled by a battle of the experts before the fact finder, not by judicial fiat." See [City of Pomona v. SQM N. Am. Corp., 750 F.3d 1036, 1048-49 \(9th Cir. 2014\)](#); see also [Johnson v. Mead Johnson & Co., LLC, 754 F.3d 557, 562 \(8th Cir. 2014\)](#) ("The district court in the instant case violated these liberal admission standards by resolving doubts in favor of keeping the testimony out

and relying upon its own assessment of the correctness of the expert opinions."); [Westberry, 178 F.3d at 261](#) ("[T]he court need not determine that the expert testimony a litigant seeks to offer into evidence is irrefutable or certainly correct. As with all other admissible evidence, expert testimony is subject to being tested by '[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof.'" (quoting [Daubert, 509 U.S. at 596](#)) (alteration adopted); see also [McCulloch v. H.B. Fuller Co., 61 F.3d 1038, 1044 \(2d Cir. 1995\)](#) (noting that perceived faults in doctor's differential diagnosis were matters for cross-examination that did not affect admissibility).

Third, the district court took issue [*29] with Dr. Sahu's choice of meteorological inputs for AERMOD. To model dispersion patterns around the Plant, Dr. Sahu had to input wind speed and direction data. Dr. Sahu inputted data from various sites and elevations to create his model. The district court concluded Dr. Sahu's testimony was unreliable because "[w]ind directions are highly variable . . . [and] a single location—such as [Sommerville's] residence—cannot have multiple wind speeds coming from various directions at one specific time." [Sommerville I, 2024 WL 1204094, at *16](#). The district court further found Dr. Sahu's testimony unreliable because Dr. Sahu used 1985-1986 onsite meteorological data from the Plant for the years 1984-2019.

These conclusions were abuses of discretion. Beyond possibly misstating the science of wind⁵—and unnecessarily attempting to make scientific findings to justify its exclusion of Dr. Sahu⁶—the district court again

⁵ Multiple wind speeds from different directions at the same time at a single geographic location is not only possible but widely accepted. See, e.g., *What Causes Tornadoes?*, NOAA (describing how tornadoes are created and noting that "[c]onditions are ripe for tornadoes when the air becomes very unstable, with winds at different altitudes blowing in different directions or at different speeds—a condition called wind shear") (emphasis added), <https://perma.cc/9MYS-P7CK>.

⁶ We agree with the dissent that the *district court* should not have fashioned itself as an "amateur scientist[]," and excluded Dr. Sahu's testimony on the basis that "a single location . . . cannot have multiple wind speeds coming from various directions at one specific time." [Sommerville I, 2024 WL 1204094, at *16](#); Diss. Op. at 38-39 n.9; cf. [Daubert, 509 U.S. at 601](#) (Rehnquist, C.J., concurring in part and dissenting in part) ("[Rule 702] imposes on [courts] [n]either the obligation

conflated admissibility with the weight a factfinder might attribute Dr. Sahu's testimony based on his choice of data. Simultaneously, the district court ignored Dr. Sahu's testimony as to why using wind data from various altitudes was proper given South Charleston's mountainous geography and why Dr. Sahu chose to use onsite [*30] data from 1985-1986 to model 1984-2019. See J.A. 532-33 (explaining that because of the "elevated point source[s]" of certain "flare emissions," Dr. Sahu used data from Yeager Airport, roughly 285 meters elevation); *id.* 572 (explaining that the *only* onsite data available at the Plant was from 1985-1986, that the Plant Owners had supplied no other data and, in Dr. Sahu's professional experience, any variation would not be significant); *see also* [Daubert](#), 509 U.S. at 596 ("Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.").

Fourth, the district court faulted Dr. Sahu for how he chose to calculate "background" EtO levels. "Background" refers to exposure levels experienced by the general population as opposed to the levels Sommerville alleges she was exposed to due to the Plant Owners' negligence. The district court found Dr. Sahu's testimony was unreliable because Dr. Sahu used data produced by the United States Environmental Protection [*31] Agency (EPA) instead of data from the West Virginia Department of Environmental Protection—data the district court described as being more "local." [Sommerville I](#), 2024 WL 1204094, at *19. The district court found Dr. Sahu was "cherry-picking" data. *Id.* at *18-19. This finding was an abuse of discretion.

Dr. Sahu didn't "cherry-pick data." Cherry-picking data means engaging in a "[r]esult-driven analysis" that "undermines principles of the scientific method." See [In re Lipitor \(Atorvastatin Calcium\) Mktg., Sales Pracs. & Prods. Liab. Litig. \(No II\) MDL 2502](#), 892 F.3d 624, 634 (4th Cir. 2018). In *Lipitor*, this court affirmed the trial court's exclusion of the plaintiffs' expert where he "cho[se] to include in his report the results of some tests he performed (which supported the plaintiffs' argument) but exclude the results of another (which did not)." *Id.* at 634-35.

Dr. Sahu did nothing of the sort. Instead, Dr. Sahu

chose to use the EPA's data because he found it more representative of Sommerville's claims. True, the EPA had reservations about aspects of its data set. See J.A. 814 (stating that while the EPA was "confident" in EtO data collected "downwind of facilities," the EPA had also detected EtO levels close to the detection limit, implying "greater uncertainty in its measurement and . . . less confiden[ce] in [its] accuracy"). But the West Virginia data the district court [*32] held Dr. Sahu should have used came with disclaimers too. *Id.* 1786 ("The project involved four (4) 24-hour sampling events. Four days of data cannot be used to calculate risk over a 70-year period."). Put simply, the weight to give Dr. Sahu's choice of EtO background data had nothing to do with the admissibility of his testimony. Though framed as a "reliability" question, the district court again waded into credibility determinations. Excluding Dr. Sahu on this basis was an abuse of discretion.

Last, the district court abused its discretion when it concluded that Dr. Sahu's report was unreliable because Dr. Sahu had wrongly maintained Covestro's emissions rates constant from 1984-2019 in AERMOD. To so find, the district court ignored Dr. Sahu's testimony that while he had erroneously held Covestro's emissions constant in his initial report, he had corrected this error in his supplemental report. *Id.* 1188-93 ("I . . . reran the model using the varying emission rates for the Covestro sources. In this supplemental report I show the results of this revised modeling and also comparisons to the prior constant emission rate results.") (cleaned up). Therefore, the district court's exclusion [*33] of Dr. Sahu on this basis was likewise an abuse of discretion.

In sum, none of the reasons for which the district court excluded Dr. Sahu's testimony were proper. And in accordance with Federal Rules of Evidence 104(a) and 702, Sommerville has established by a preponderance of evidence that Dr. Sahu's testimony is admissible. Therefore, Dr. Sahu's exclusion was an abuse of discretion.⁷

⁷ The dissent is unclear "what line" we "intend to draw." Diss. Op. at 36. We do not question that a district court can decide "that an expert's opinion lacks sufficient support in the record" or that "there is simply too great an analytical gap between [an expert's] data and the opinion proffered." *Id.*; [Gen. Elec. Co. v. Joiner](#), 522 U.S. 136, 146 (1997). Rather, we underscore that a district court may not exclude expert testimony based on (1) its *mere disagreement* with an expert's choice of data or (2) its *own* assessment of the correctness of an expert's opinions. See [Bresler v. Wilmington Tr. Co.](#), 855 F.3d 178, 195 (4th Cir. 2017) (noting "questions regarding the factual underpinnings

[n]or the authority to become amateur scientists"). We include the information in the preceding footnote only to emphasize the danger trial courts run when, as the district court did here, they attempt to exclude expert testimony in this fashion.

IV.

For the reasons stated above, we reverse the district court's grant of summary judgment to the Plant Owners and its exclusion of Dr. Sahu.

REVERSED AND REMANDED

Dissent by: DIAZ

Dissent

DIAZ, Chief Judge, dissenting:

West Virginia courts have opened their doors to claims for damages, like Sommerville's, in which the only claimed injury is a present need for medical monitoring. In my view, Article III standing principles prevent us from doing the same. Because my colleagues conclude otherwise, I respectfully dissent.

I.

West Virginia allows plaintiffs to bring medical monitoring claims "to recover the anticipated costs of long-term diagnostic testing necessary to detect latent diseases that may develop as a result of tortious exposure to toxic substances." [Bower v. Westinghouse Elec. Corp.](#), 522 S.E.2d 424, 429 (W. Va. 1999). Plaintiffs must show—as relevant here—that an exposure to a hazardous substance [*34] put them at a "significantly increased risk of contracting a particular disease" that makes diagnostic testing "reasonably necessary." [Id. at 433](#). They don't need to show that they've experienced any physical harm, nor any certainty (or even likelihood) that a disease will occur. *Id.*

But to get into federal court, a state law injury isn't enough. As my colleagues agree, Sommerville (who alleges she was exposed to a carcinogen emitted from Defendants' operations at a manufacturing facility in South Charleston, West Virginia near her home) must show that she's suffered an injury in fact sufficient for Article III.

of the [expert witness'] opinion affect the weight and credibility of the witness' assessment, not its admissibility") (cleaned up); [Rappuhn v. Primal Vantage Co.](#), No. 23-10050, 2024 WL 2930448, at *4 (11th Cir. June 11, 2024) ("[C]rediting one expert over another . . . misapplies *Daubert* and intrudes on the province of the jury."). These errors permeate the district court's order excluding Dr. Sahu and dictate reversal.

Sommerville doesn't claim that she's been physically harmed. Nor does she claim that her injury in fact is an increased risk of developing cancer. And for good reason, because a "risk of future harm . . . cannot, by itself, establish concrete injury to have standing to seek damages." [Penegar v. Liberty Mut. Ins. Co.](#), 115 F.4th 294, 302 (4th Cir. 2024) (citing [TransUnion LLC v. Ramirez](#), 594 U.S. 413, 436 (2021)).

Instead, Sommerville's asserted injury is the "necessary medical monitoring costs resulting from toxic exposure." Appellant's Br at 12. For the majority, that's enough for standing.¹ I disagree and would instead hold that medical monitoring costs (incurred or anticipated), without more, can't confer standing [*35] to seek damages in federal court.

Our decision in [Beck v. McDonald](#), 848 F.3d 262 (4th Cir. 2017), explains why. There, plaintiffs sued after their medical records were stolen from a Veterans Affairs medical center. [Id. at 267-68](#). They brought data privacy claims seeking damages and declaratory and injunctive relief. *Id.* They claimed two injuries in fact: (1) "the increased risk of future identity theft," [id. at 273](#), and (2) "the cost of measures to guard against identity theft, including the costs of credit monitoring services," that they had incurred or would incur, [id. at 276](#).

But we rejected the first because, under the circumstances of the data breaches, the risk that the plaintiffs' identities would be stolen was too speculative.² [Id. at 274](#). And the second was "merely a repackaged version" of the first. [Id. at 276](#) (cleaned up). It too failed because "costs . . . incurred in response to a speculative threat" can't confer standing.³ [Beck](#), 848

¹ Neither the *Bower* court, in its assessment of the common-law principles underlying medical monitoring claims, nor the majority, in its injury-in-fact analysis, disaggregate the exposure from the costs of medical monitoring. Though both mention the exposure, both focus on the economic harm of medical monitoring costs stemming from the exposure. So the asserted injury in fact here appears to be the costs of medical monitoring, not the exposure that creates the need for those costs.

I don't read the majority opinion to hold that exposure alone is an injury in fact. Nor could I join such a novel holding without substantially more analysis than what the majority offers.

² Recall that Sommerville doesn't press that her injury in fact is an increased risk of developing cancer.

³ The plaintiffs in [Clapper v. Amnesty International USA](#), 568

F.3d at 276-77 (quoting *Clapper v. Amnesty Int'l USA*, 568 U.S. 398, 416 (2013)); see also *Remijas v. Neiman Marcus Grp., LLC*, 794 F.3d 688, 694 (7th Cir. 2015) ("Mitigation expenses do not qualify as actual injuries where the harm is not imminent.").

So too here. Sommerville claims that she's at an increased risk of developing cancer and that the risk creates a present need for medical monitoring—the costs of which are her injury in fact. But to confer Article III standing, [*36] these costs must be based on a future harm that is "certainly impending." *Clapper*, 568 U.S. at 409, 416.

Though the future harm here—cancer—is serious, it's not certainly impending. The record doesn't show who in the putative class (if anyone) will develop cancer or when (if ever). Because the risk of this harm coming to pass, even if heightened, is uncertain, monitoring costs based on such a risk aren't enough for Article III standing.

According to the majority, I "misapprehend[]" the injury it recognizes. Majority Opinion at 17. I think not.

I don't rely on *Beck* because I see here a similarly "attenuated chain of possibilities." *Id.* (quoting *Beck*, 848 F.3d at 275). Nor is that alone what *Beck* relied on to decide the case. And I would know—I wrote it!

Beck instructs that for costs stemming from a potential future harm to be an injury in fact, the underlying future harm must be a non-speculative one. The future harm underlying the credit-monitoring-cost injury asserted in *Beck* was not that the plaintiffs' medical records had been stolen—it was the risk of identity theft. Similarly, the future harm underlying the medical-monitoring-cost injury asserted here is not the EtO exposure—it's the

U.S. 398 (2013), sought injunctive relief, and Sommerville seeks damages. Still, *Clapper's* reasoning with respect to the mitigation injury asserted there applies here. *Id.* at 415 (costs incurred to protect confidentiality of communications based on risk of surveillance).

In each case, plaintiffs claimed to be suffering "present injury" because the risk of a harm in the future created the need to incur certain costs now and in the future (and, in *Clapper*, it had forced them to incur such costs already). *Id.* at 401. That type of injury can be addressed by eliminating the risk that the future harm will occur (via injunction) or by shifting the costs to the defendant (via damages). A plaintiff who lacks standing to seek an injunction because the underlying "future harm . . . is not impending" shouldn't have standing to seek damages for costs incurred based on that same speculative harm. *Id.*

risk of developing cancer. In each case, plaintiffs [*37] seek to "monitor" something that may occur, not the event that's already occurred.

Here and in *Beck*, the future harm underlying the monitoring-cost injury is speculative. It doesn't matter that the future harm in *Beck* isn't speculative in precisely the same manner as here. Because the underlying future harm is speculative, costs needed or incurred based on that harm can't be an injury in fact.

II.

There's yet another reason Sommerville lacks standing. The district court, in my view, correctly excluded Dr. Ranajit Sahu's expert testimony. And without Sahu's testimony, Sommerville can't meet her burden at summary judgment to demonstrate an injury in fact.

A.

Sommerville hired Dr. Sahu to reconstruct ethylene *oxide*, or "EtO,"⁴ emissions from the Defendants' South Charleston industrial facility between 1984 and 2019 and to create an air dispersion model⁵ to estimate cumulative EtO exposure levels at points near the facility.

According to Sahu, this model could estimate an individual's cumulative EtO exposure based on where they lived and the years they lived there. Sommerville's other experts would use these [*38] cumulative exposure estimates and background EtO levels—which Dr. Sahu also estimated—to calculate each class member's relative risk of developing certain cancers.

⁴ EtO is a human carcinogen. *Our Current Understanding of Ethylene Oxide (EtO)*, EPA, <https://www.epa.gov/hazardous-air-pollutants-ethylene-oxide/our-current-understanding-ethylene-oxide-eto> [<https://perma.cc/F53C-JPUV>]. Long-term exposure to EtO increases the risk of certain cancers, while "[s]hort-term inhalation exposure to high amounts of EtO can cause headache, dizziness, nausea, fatigue, respiratory irritation[,] . . . and, in some cases, . . . gastrointestinal distress." *Id.*

⁵ Air dispersion modeling uses mathematical formulas to simulate "the atmospheric processes that disperse [an air] pollutant emitted by a source." *Air Quality Dispersion Modeling*, EPA (Nov. 21, 2024), <https://www.epa.gov/scram/air-quality-dispersion-modeling> [<https://perma.cc/F7C6-L6C6>]. An air dispersion model "can be used to predict concentrations" of an air pollutant at locations around the source. *Id.*

When faced with expert testimony, the district court's gatekeeping responsibility is to "ensur[e] that [the] testimony both rests on a *reliable* foundation and is *relevant* to the task at hand." [*Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 597 \(1993\)](#) (emphases added). To be reliable, an expert's opinion must be "based on scientific, technical, or other specialized knowledge and not on belief or speculation," and any "inferences must be derived using scientific or other valid methods." [*Nease v. Ford Motor Co.*, 848 F.3d 219, 229 \(4th Cir. 2017\)](#) (emphasis omitted) (quoting [*Oglesby v. Gen. Motors Corp.*, 190 F.3d 244, 250 \(4th Cir. 1999\)](#)).

The question isn't whether we would have admitted Dr. Sahu's testimony in the first instance, but whether the district court abused its discretion in excluding it. The Supreme Court has cautioned us against being "overly stringent" in answering this question. [*Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 143 \(1997\)](#). After all, "[i]t is very much a matter of discretion with the court whether to receive or exclude the evidence," so we should not reverse "unless the ruling is manifestly erroneous." [*McKiver v. Murphy-Brown, LLC*, 980 F.3d 937, 962 \(4th Cir. 2020\)](#) (quoting [*Gen. Elec. Co.*, 522 U.S. at 142](#)).

Here, the district court concluded that Sahu's expert testimony wasn't well-grounded in the facts and data available [*39] and was thus unreliable. [*Sommerville v. Union Carbide Corp.*, No. 19-CV-00878, 2024 WL 1204094, at *1 \(S.D. W. Va. Mar. 20, 2024\)](#). The district court didn't abuse its discretion. In fact, the court was right.

1.

The majority faults the district court for focusing on Dr. Sahu's justifications for his inputs into the "AERMOD" modeling system, rather than on the system itself. According to the majority, this flouts *Daubert*, which directs courts to focus on methodology. Not so.

The AERMOD modeling system and Sahu's model aren't the same. The fact that the AERMOD modeling system could (in theory) produce a sufficiently reliable dispersion model⁶ doesn't settle whether Sahu's dispersion model was sufficiently reliable. Instead, the reliability of Sahu's model depends on the reliability of

the inputs, as Dr. Sahu himself agreed.⁷ *E.g.*, J.A. 219 (agreeing that "the accuracy of the model bears a strong positive relationship to the correct inputs being used . . . that represent the actual condition in the facilities in its emissions sources").

True, *Daubert* directs us to focus on "principles and methodology, not on the conclusions that they generate." [*509 U.S. at 595*](#). But an expert who constructs a model based on faulty assumptions and irrelevant data shouldn't be handed a "get-out-of-*Daubert*-free card" simply [*40] because he uses an otherwise reliable modeling system. [*In re Lipitor \(Atorvastatin Calcium\) Mktg., Sales Pracs. & Prods. Liab. Litig. \(No II\) MDL 2502*, 892 F.3d 624, 641 \(4th Cir. 2018\)](#); see also [*id. at 643-44*](#).

A modeling expert's methodology doesn't end with selecting a modeling system. The expert must also develop the inputs and assumptions used to create the model.⁸ Here, the district court had to consider whether those inputs and assumptions are supported by "scientifically valid" "reasoning or methodology," [*Daubert*, 509 U.S. at 592-93](#), such that the resulting model is "based on sufficient facts or data," [*Fed. R. Evid. 702\(b\)*](#). And that's precisely what the district court did.

But, says the majority, "questions regarding the factual underpinnings of the expert witness[s] opinion affect the weight and credibility of the witness[s] assessment, not its admissibility." Majority Opinion at 21, 23 (cleaned up) (quoting [*Bresler v. Wilmington Tr. Co.*, 855 F.3d 178, 195 \(4th Cir. 2017\)](#)).

I can't tell what line my colleagues intend to draw here, especially because *Daubert* inquiries are inherently "tied to the facts of a particular case." [*Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 150 \(1999\)](#) (cleaned up). Yet they can't possibly mean that district courts may not decide that an expert's opinion lacks sufficient support in the record, cf. [*Fed. R. Evid. 702\(b\)*](#), or conclude "that there is simply too great an analytical gap between [an expert's] data and the opinion proffered," [*Gen. Elec. Co.*, 522 U.S. at 146](#).

⁷ Put more bluntly, garbage in, garbage out.

⁸ Even Dr. Sahu considered developing these inputs to be his methodology. The "Methodology" section of his expert report focuses exclusively on how he "reconstruct[ed] operations and identif[ied] emission and waste sources." J.A. 467-68; see also J.A. 494.

⁶ The Defendants don't challenge the reliability of the AERMOD modeling system. So I assume that the system doesn't introduce any separate *Daubert* concerns here.

We've faulted district courts [*41] for "abdicate[ing] [their] responsibility" with respect to expert testimony based on the belief "that the question of whether an expert's opinion had an adequate basis in fact should be handled by opposing counsel through cross examination and in jury argument." [*Tyger Constr. Co. v. Pensacola Constr. Co.*, 29 F.3d 137, 143 \(4th Cir. 1994\)](#); see also [*Sardis v. Overhead Door Corp.*, 10 F.4th 268, 281-82 \(4th Cir. 2021\)](#).

The district court recognized its duty here and honored it. We should commend the court, not reverse its ruling.

2.

Nor can I agree with the majority that the district court's concern about a lack of validation was misplaced. See [*Sommerville*, 2024 WL 1204094, at *12, *14](#). Validation (as in "data validation") can refer to specific protocols used to confirm data quality. But I take the district court to have used "validate" in a more colloquial sense—as in "substantiate" or "support."

The district court had good reason to be concerned about Dr. Sahu's failure to justify the assumptions he made in creating the inputs for the dispersion model. See [*Daubert*, 509 U.S. at 590](#) ("Proposed testimony must be supported by appropriate *validation*—i.e., 'good grounds,' based on what is known." (emphases added)). Here again, the district court was simply doing its job as the "gatekeeper[] of expert testimony." [*Sardis*, 10 F.4th at 275](#) (cleaned up).

3.

What's left are a series of concerns squarely within the district court's [*42] purview—that the inputs were "speculative" and "premised on assumptions that [did] not accurately represent the Defendants' operations in South Charleston." [*Sommerville*, 2024 WL 1204094, at *1](#); see, e.g., [*In re Lipitor*, 892 F.3d at 633-35](#) (unrepresentative data set, flawed logic, unsound assumptions); [*EEOC v. Freeman*, 778 F.3d 463, 466-67 \(4th Cir. 2015\)](#) (unexplained discrepancies in data set, analytical fallacies); [*Belville v. Ford Motor Co.*, 919 F.3d 224, 229 \(4th Cir. 2019\)](#) (unsupported assumptions). I can't agree with the majority's attempt to recast these problems as a "mere disagreement with [Sahu's] choice of data" or an "assessment of the correctness" of his ultimate opinions. Majority Opinion at 28 n.7 (emphases omitted).

Sahu's model purports to estimate actual emissions. Yet he relied on values that expressly didn't represent actual

emissions. [*Sommerville*, 2024 WL 1204094, at *13](#). Sahu himself "identified inconsistencies in [the] reported EtO emissions," J.A. 1188, but he "[n]onetheless . . . used [those] emissions for . . . various years in updating [his] modeling," J.A. 1190.

And Sahu ignored telltale signs that there might be a problem with the emissions values he used. For example, his model shows that in 1984 the cumulative EtO exposure at a point a half mile from the South Charleston facility was 100 times greater than in other years, J.A. 535, yet that outlier raised no red flags [*43] for Sahu—at least none that warranted an explanation.

The model also required meteorological inputs. To develop them, Sahu combined meteorological data from three locations—one year of hourly wind speed and wind direction data from near the South Charleston facility (which he supplemented with data from an airport five miles away); twice-daily upper air data from a town fifty miles away; and other meteorological parameters also from the airport. But Sahu never explained why the data from some distance away was representative of the conditions near the facility.⁹ See [*Tyger Constr. Co.*, 29 F.3d at 143](#).

Sahu filled in gaps in the emissions and meteorological data with assumptions. That isn't problematic on its own. "Trained experts commonly extrapolate from existing data." [*Gen. Elec. Co.*, 522 U.S. at 146](#). But those assumptions must be "connected to existing data" by more than just "the *ipse dixit* of the expert." *Id.*

Sahu justified some of his assumptions in his initial report, but he simply identified others. And his rebuttal report and deposition testimony provided little support beyond his say-so.

In many instances, Sahu held a value (e.g., emissions, operations) from one year constant over several years

⁹ It strikes me as unwise for courts to opine on "the science of wind"—whatever that entails—unless absolutely necessary. Majority Opinion at 25 & n.5; cf. [*Daubert*, 509 U.S. at 601](#) (Rehnquist, C.J., concurring in part and dissenting in part) ("[Rule 702] (Continued) imposes on [courts] [n]either the obligation [n]or the authority to become amateur scientists."). That's especially true here, where we're unaided by briefing or record evidence. Whatever direction the science of wind blows, Dr. Sahu failed to support his meteorological assumptions. And whatever the district court's "scientific finding[s]," Majority Opinion at 25, it acted well within its discretion to conclude as much, [*Sommerville*, 2024 WL 1204094, at *17](#).

(or, for the meteorological data, for the [*44] entire thirty-year period at issue). But as the district court correctly recognized, he failed to explain why such values were unlikely to change significantly from year to year.

The district court "identified and articulated clear . . . concerns it had about the manner in which [Dr. Sahu] reached his conclusions." [*In re Lipitor*, 892 F.3d at 638](#). I'm not left with "a definite and firm conviction that the [district] court . . . committed a clear error of judgment" in carrying out its gatekeeping responsibility. [*Freeman*, 778 F.3d at 466](#). To the contrary, the district court's decision to exclude Dr. Sahu's opinion is right on the merits.

In holding otherwise, the majority wrongly invites district courts to "delegate [their] gatekeeping responsibility to the jury." [*Nease*, 848 F.3d at 231](#).

B.

Without Dr. Sahu's opinion, Sommerville can't carry her burden to present evidence sufficient to demonstrate Article III standing.

At summary judgment, Sommerville "cannot rest on mere allegations but must set forth evidence which . . . would establish the elements of Article III standing." [*Fernandez v. RentGrow, Inc.*, 116 F.4th 288, 295 \(4th Cir. 2024\)](#). Though we view the evidence in Sommerville's favor, *id.*, we "may not consider inadmissible evidence" at summary judgment, [*Giles v. Nat'l R.R. Passenger Corp.*, 59 F.4th 696, 704 \(4th Cir. 2023\)](#).

So even if the need for and costs of medical monitoring is an injury in fact, Sommerville [*45] can't establish that injury in fact without Dr. Sahu's opinion. His model is the only evidence that, for example, indicates that Sommerville was exposed to EtO emitted by the Defendants' operations. And without Sahu's estimates of her cumulative exposure, Sommerville's other experts couldn't calculate her relative risk of developing certain cancers, or opine on the significance of that risk, or her need for medical monitoring.

III.

I have no quarrel with the West Virginia Supreme Court of Appeals' reasons for recognizing a medical monitoring cause of action, which the majority aptly recounts. But the need for and costs of medical monitoring—without more—isn't an injury in fact sufficient for Article III standing. Even if it were,

Sommerville can't demonstrate such an injury without Dr. Sahu's expert testimony, which the district court properly excluded.

Because the majority holds otherwise, I dissent.

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