PUBLISHED

UNITED STATES COURT OF APPEALS
FOR THE FOURTH CIRCUIT

No. 20-1334

CHRISTOPHER LIGHTFOOT,

Plaintiff - Appellant,

v.

GEORGIA-PACIFIC WOOD PRODUCTS, LLC; GEORGIA-PACIFIC LLC, individually and as successor-in-interest to Georgia-Pacific Corporation; WEYERHAEUSER COMPANY,

Defendants - Appellees,

and

WEYERHAEUSER NR COMPANY; LOWE'S HOME CENTERS, LLC (NC); JOHN DOE #1,

Defendants.

Appeal from the United States District Court for the Eastern District of North Carolina, at Wilmington. Louise W. Flanagan, District Judge. (7:16-cv-00244-FL)

Argued: May 5, 2021 Decided: July 14, 2021

Before NIEMEYER, WYNN, and RICHARDSON, Circuit Judges.

Affirmed by published opinion. Judge Niemeyer wrote the opinion, in which Judge Wynn and Judge Richardson joined. Judge Wynn wrote a concurring opinion.

ARGUED: Sean Reed Cox, LAW OFFICERS OF SEAN R. COX, Dallas, Texas, for Appellant. Paul K. Sun, Jr., ELLIS & WINTERS LLP, Raleigh, North Carolina, for Appellees. **ON BRIEF:** Lee B. Lesher, ALLEN STEWART, P.C., Dallas, Texas, for Appellant. Leslie C. Packer, Christopher W. Jackson, Preetha Suresh Rini, ELLIS & WINTERS LLP, Raleigh, North Carolina, for Appellees Georgia-Pacific Wood Products LLC and Georgia-Pacific LLC. Joshua J. Metcalf, Alison O. McMinn, Spencer M. Ritchie, FORMAN WATKINS & KRUTZ LLP, Jackson, Mississippi, for Appellee Weyerhauser Company.

NIEMEYER, Circuit Judge:

Christopher Lightfoot, at age 39, was diagnosed with nasal cancer, and he maintains that his cancer was caused by his exposure to wood dust while working in his father's backyard woodshop during the period from when he was 6 to when he was 18 — an "exposure period" extending from 1981 to 1992. He commenced this action against Georgia-Pacific Wood Products, LLC; Georgia-Pacific LLC; and Weyerhaeuser Company, alleging that they produced the lumber that Lightfoot's father used in his woodshop and are liable to him for damages because they failed to warn his father that wood dust causes cancer.

The district court granted the defendants summary judgment, concluding, among other things, that during the exposure period, the defendants did not have a duty to warn Lightfoot's father that wood dust causes cancer because that fact was not known at the time as part of the "state of the art," i.e., the level of knowledge reached. Lightfoot contends, however, that the district court erroneously concluded that the state of the art was reflected solely in the recognition by the Occupational Safety and Health Administration (OSHA) in 1995 that wood dust causes cancer, improperly creating an "OSHA litmus test." Lightfoot argues that such a conclusion was too narrow and that an appropriately broad understanding of the state of the art would include knowledge that triggered a duty on the defendants to warn their customers of the risk of cancer during the exposure period. With such a warning, he continues, his father could then have protected him by requiring him to wear a dust mask.

We conclude, however, that the district court properly concluded from the record that the state of the art did not indicate that wood dust causes cancer until 1995, a few years after the exposure period at issue ended, and therefore that the defendants had no duty to warn Lightfoot's father of any risk of cancer during that period. Accordingly, we affirm.

I

Christopher Lightfoot's father was a hobbyist woodworker who built a modest woodshop in the backyard of his home in Winfall, North Carolina. He used his woodshop to build picnic tables, cabinets, chair swings, fence slats, vegetable bins, and the like. Roughly 60% of the wood that he used, he retrieved from a "reject pile" at the Weyerhaeuser lumber mill in Plymouth, North Carolina, where he worked as a machine-maintenance mechanic. This wood was mainly pine, a softwood. The rest of the wood that he used, he purchased from Lowe's Home Improvement and Builder's Discount Supply, which were in turn supplied by Georgia-Pacific and Weyerhaeuser. That wood was also mostly pine. On rare occasions, however, Lightfoot's father purchased hardwood lumber as needed for a specific project.

In 1981, when Lightfoot was 6 years old, he began helping his father in the woodshop by sweeping and shoveling wood dust, retrieving tools for his father, and generally moving items about the shop as needed. By the time he was 10 years old, he was actively involved in woodworking, using power drills, saws, and sanders. In 1992, when he was 18, he left home for college and stopped working in the woodshop. Thus, his exposure to wood dust occurred from 1981 to 1992.

During his early years in the woodshop, Lightfoot spent about 5 hours per week in the shop, and from the time he began to engage in woodworking until he left for college, he spent roughly 20 to 25 hours per week in the shop. Neither Lightfoot nor his father ever wore a dust mask during the exposure period.

Over 20 years later, in April 2014, Lightfoot was diagnosed with intestinal-type adenocarcinoma, a form of sinonasal cancer. He has offered evidence in the form of expert-witness testimony that his childhood exposure to wood dust caused this cancer.

Lightfoot commenced this action in 2016, alleging that Georgia-Pacific and Weyerhaeuser had a duty to warn his father that wood dust is carcinogenic but failed to do so and therefore that they were liable to him under theories of negligence and products liability. Following discovery, however, the district court granted the defendants' motion for summary judgment, relying on two independent grounds.

First, the district court held that the defendants did not have a duty to warn Lightfoot's father about the carcinogenicity of wood dust because the "state of the art" during the 1981 to 1992 exposure period did not indicate that wood dust causes nasal cancer. As the court explained, "The state of the art regarding carcinogenicity, as reflected in OSHA [Hazard Communication (HazCom)] regulations and the definitive scientific sources to which they point for reliance, is that wood dust was not known to be a carcinogen until designated as such by the [International Agency for Research on Cancer (IARC)] in 1995." *Lightfoot v. Georgia-Pacific Wood Prods., LLC*, 441 F. Supp. 3d 159, 171 (E.D.N.C. 2020). The court observed further that while literature published during the exposure period did connect cancer with wood dust, that connection existed only as to

"persons working in the furniture and cabinet making industry" who were exposed to hardwood dust. *Id.* at 176. Accordingly, the court concluded that Lightfoot's father, as a retail consumer of mostly softwood products, was not owed any warning of the later-discovered danger.

Second, the court also held that Lightfoot had failed to create a genuine issue of material fact as to proximate causation. The court explained that, "as a threshold matter, there is a lack of evidence regarding the types of warnings that could have been used during the exposure period, their content, their manner of presentation, and their location." *Lightfoot*, 441 F. Supp. 3d at 178. The court noted further that "[t]here [was] insufficient evidence that plaintiff's exposure to wood dust would have been reduced meaningfully if hypothetical warnings had been communicated to plaintiff's father." *Id.* Notably, it observed that "even today, after plaintiff's father has been personally informed by plaintiff and plaintiff's attorney that wood dust allegedly caused his son to be afflicted with sinonasal cancer, plaintiff's father wears a dust mask [only] 'sometimes.'" *Id.*

From the district court's summary judgment dated February 21, 2020, in favor of the defendants, Lightfoot filed this appeal.

II

For his principal argument on appeal, Lightfoot contends that the district court erred in concluding that the defendants did not have a duty to warn his father about the carcinogenicity of wood dust. Specifically, he argues that the court "ignored or otherwise disregarded" state-of-the-art evidence that "show[ed] that wood dust was a known

carcinogen before and during" the exposure period and that the defendants therefore "knew or should have known of the carcinogenic danger associated with their products," triggering a duty to warn their customers, including his father, of that danger. In his complaint, Lightfoot alleged that the defendants were liable to him under theories of negligence and products liability. As to negligence, he alleged that "each defendant knew, or should have known, that Plaintiff . . . would be in danger of developing sinonasal cancer . . . [and] was negligent in . . . failing to adequately warn Plaintiff [of the danger.]" Similarly, in alleging products liability, Lightfoot alleged that "[e]ach of the defendants' products was defective, *inter alia*, in their . . . lack of proper or sufficient warnings" and that "[e]ach defendant either knew, or in the exercise of reasonable care should have known, that their products would cause injuries in the form of sinus cancer."

Claims for failure to warn under North Carolina law, whether rooted in negligence or products liability, require the plaintiff to establish that the defendant owed the plaintiff "a duty to warn of danger, the nonperformance of which will, when it is the proximate cause of injury, give rise to liability." *Stegall v. Catawba Oil Co. of N.C.*, 133 S.E.2d 138, 142 (N.C. 1963) (addressing negligence claims); *Crews v. W.A. Brown & Son, Inc.*, 416 S.E.2d 924, 928 (N.C. Ct. App. 1992) ("As with other negligence actions, the essential elements of a products liability action based upon negligence are: (1) duty, (2) breach, (3) causation, and (4) damages"); N.C. Gen. Stat. § 99B-5(a) (providing that a manufacturer or seller of a product is not liable "in any product liability action for a claim based upon inadequate warning . . . unless the claimant proves [among other elements] that . . . the product, without an adequate warning . . . , created an unreasonably dangerous

condition that the manufacturer or seller knew, or in the exercise of ordinary care should have known, posed a substantial risk of harm to a reasonably foreseeable claimant"). A duty to warn is imposed on a manufacturer or seller when it has either "actual or constructive knowledge" of a product's danger. *Stegall*, 133 S.E.2d at 142; *see also N*.C. Gen. Stat. § 99B-5(a). And the knowledge imputed to the manufacturer or seller is based on "the state of the art." *Horne v. Owens-Corning Fiberglas Corp.*, 4 F.3d 276, 280 (4th Cir. 1993).

"State of the art represents all of the available knowledge on a subject at a given time, and this includes scientific, medical, engineering, and any other knowledge that may be available." *Horne*, 4 F.3d at 281 (quoting *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156, 1164 (4th Cir. 1986)). Significantly, it is "the *culmination* of the relevant research" in a given field, *id.* (emphasis added), or, stated otherwise, the *synthesis* of the available knowledge on a certain subject *at a given time*, *see Lohrmann*, 782 F.2d at 1164 (noting that "[s]tate of the art [also] includes the element of time: [w]hat is known and when was this knowledge available"). The state of the art is not defined by cutting-edge knowledge or new research that "pushes the envelope." And, "because it often is scientific in nature and results from a cumulative review of a field over time," state-of-the-art evidence "should not be applied retroactively to *discredit* conduct at a given time prior to the culmination of the relevant research." *Horne*, 4 F.3d at 281.

In light of these principles, the question presented in this case is whether the state of the art during Lightfoot's exposure period — 1981 to 1992 — indicated that wood dust causes cancer such that the defendants had a duty to warn Lightfoot's father about that

danger. And to answer that question, we consider the development of the scientific literature addressing that subject.

On this subject, the district court concluded:

> The state of the art regarding carcinogenicity, as reflected in OSHA HazCom regulations and the definitive scientific sources to which they point for reliance, is that wood dust was not known to be a carcinogen until designated as such by the IARC in 1995. . . . In that same year, OSHA stated that, due to the findings in the 1995 IARC monograph, "the [material safety data sheets] for hardwood species and those sheets for mixed species of hardwoods and soft woods must be identified as a carcinogen . . . ."

Lightfoot, 441 F. Supp. 3d at 171 (emphasis omitted).

IARC (the International Agency for Research on Cancer) is a subsidiary of the World Health Organization of the United Nations that is widely considered to be a leading authority on cancer research. It conducts and coordinates research into the causes of cancer, and it also collects studies and data worldwide regarding the occurrence of cancer, evaluates them, and publishes its conclusions in monographs. Its monographs are considered authoritative by agencies of the United States and the European Union. For example, when IARC "publishes a finding that the available information indicates" that a "chemical is a potential or confirmed carcinogen," OSHA requires U.S. employers to "provide [such] information to their employees." OSHA Hazard Communication Rule, 48 Fed. Reg. 53,280, 53,280, 53,295 (Nov. 25, 1983); *see also* 29 C.F.R. § 1910.1200. Indeed, Lightfoot's own expert in this case acknowledged that "IARC is generally considered to be the world's most highly respected scientific organization that determines the carcinogenicity of chemicals and substances." Appropriately, therefore, the district

court looked first to IARC monographs in assessing the state of the art on the carcinogenicity of wood dust.

IARC first reported on the carcinogenicity of wood dust in a monograph issued in 1981, and it did so again in a supplement issued in 1987. In both publications, IARC concluded that there is "sufficient evidence" that nasal cancers "have been caused by employment in the furniture-making industry." (Emphasis omitted). But it was not until its 1995 monograph that IARC concluded that "wood dust is carcinogenic to humans." (Emphasis omitted). When IARC published that conclusion, OSHA revised its interpretation of its Hazard Communication regulation to state that the material data safety sheets "for hardwood species and those sheets for mixed species" must identify wood dust "as a carcinogen."

Importantly, IARC's 1995 conclusion was not reached in a sudden eureka moment. Rather, it was the culmination of ongoing syntheses of scientific evidence collected and evaluated over the years about the relationship between wood dust and cancer in various contexts.

In 1981, IARC published a monograph on the carcinogenic risks in "wood, leather and some associated industries," and the monograph collected studies going back to the 1960s detailing the carcinogenic risks associated with working in the lumber and sawmill industries, the carpentry and joinery industries, and the furniture and cabinet-making industries. From those data, it concluded that available studies were "not sufficient to make a definite assessment of the carcinogenic risks of employment in the lumber and sawmill industries" or in carpentry or joinery, although a few studies suggested that "incidences of

nasal cancers . . . may be increased." It explained further that "[t]here is evidence of a link between the occurrence of nasal cancers in furniture workers and the introduction of mechanized operations that produce high levels of wood dust." That evidence was drawn from a series of studies of English and Welsh furniture workers in the 1960s and 1970s, as well as studies in other countries. IARC was able to conclude that "*there is sufficient evidence* that nasal adenocarcinomas," i.e., nasal cancer, "have been caused by employment in the furniture-making industry."

In 1987, IARC issued a supplement to its 1981 monograph. The supplement noted that "[n]asal tumors . . . have been linked with work in the lumber and sawmill industries, but the results are not consistent." It continued that "[t]he epidemiological data available suggests that there may be a carcinogenic risk connected with employment as a carpenter or joiner, although some of the studies produce negative results." It did reaffirm, however, that "[e]mployment in the furniture-making industry has been associated with nasal adenocarcinoma; an increased risk for other nasal cancers has also been suggested." And "[s]ubsequent case reports and epidemiological studies have clearly corroborated an increased risk of nasal adenocarcinoma among workers in the furniture and cabinet-making industry."

Finally, in 1995, IARC issued its monograph reporting its broader conclusion, based on its ongoing assessments of studies, that wood dust causes cancer. This conclusion, as the monograph explained, was "based on the observation of a marked increase in the occurrence of cancers of the nasal cavities . . . among workers exposed predominantly to hardwood dusts."

Parallel to IARC's work, the National Institute for Occupational Safety and Health (NIOSH), a research agency located within the Centers for Disease Control and Prevention, reviewed and summarized the literature on the health effects of exposure to wood dust in 1987. This 1987 review stated that an "association between nasal cancer and occupations involving exposure to wood dust has been clearly established in the literature" and that this "relationship . . . was first noted in the late 1960's in Great Britain." The NIOSH review continued that "the association between nasal adenocarcinoma and wood dust exposure is particularly strong among furniture industry workers, although other woodworkers have also been shown to be at risk."

Based on its review of these reports, the district court concluded that neither the National Toxicology Program (NTP), a part of the Department of Health and Human Services, nor NIOSH nor IARC indicated before 1995 that wood dust causes cancer. The court noted also that Lightfoot "has not brought forth any other 'available knowledge' of carcinogenicity of wood dust constituting state of the art during the exposure period." *Lightfoot*, 441 F. Supp. 3d at 172. The court also reasoned:

> [T]he importance of the "carcinogenicity" designation in the state of the art during the exposure period is illustrated by the fact that NTP, NIOSH, and IARC [did] not designate wood dust as a carcinogen during the exposure period, but then later [did] expressly identify wood dust as a carcinogen after the exposure period. If their earlier findings were equivalent to a determination that wood dust [was] a carcinogen, then there would have been no need for a further, and different, statement that wood dust was a carcinogen in the 1995 IARC monograph, and NTP publication.

Id. at 173.

Based on the record, we agree with the district court's conclusion that, "based on the state of the art during the exposure period, wood dust was not a known cause of sinonasal cancer, . . . nor should it have been known as a carcinogen. As a result, defendants did not have a duty to warn plaintiff that wood dust was a carcinogen." *Lightfoot*, 441 F. Supp. 3d at 172.

Lightfoot makes several arguments challenging this conclusion, to which we now turn.

A

Lightfoot argues first that the district court's reading of the state of the art was too narrow, placing too much weight on the conclusion announced by OSHA in 1995. He argues that the district court essentially established an "OSHA litmus test," abrogating manufacturers' duty to reasonably inform themselves. But this argument itself reads the district court's analysis too narrowly.

In analyzing the state of the art during the exposure period, the district court did indeed point to the state of the art disclosed in OSHA's 1995 Hazard Communication update, but it did so as a vehicle to reach "the definitive scientific sources to which [OSHA] point[ed] for reliance." *Lightfoot*, 441 F. Supp. 3d at 171. And those sources indicated that "wood dust was not known to be a carcinogen until designated as such by the IARC in 1995." *Id.* IARC, in turn, relied on over 25 years of studies on the subject. The district court also pointed to actions taken by the NTP and NIOSH.

The district court's reliance on this accumulation of evidence did not create an OSHA litmus test. To the contrary, the court recognized that OSHA "does not purport to define by itself the state of the art, but rather expressly references the existing medical, industrial and scientific literature." *Lightfoot*, 441 F. Supp. 3d at 174. It did, however, recognize that IARC, to which OSHA referred, did reflect the state of the art, at least in the context of this case. IARC is a specialized agency of the World Health Organization that, as it itself represents, examines "*all relevant information* in order to assess the strength of the available evidence that certain exposures could alter the incidence of cancer in humans," and it tasks itself with collecting and evaluating "*all appropriate data*." (Emphasis added).

Thus, it cannot be validly argued, as Lightfoot attempts to do, that the district court established an OSHA litmus test to the exclusion of other relevant evidence. To the contrary, the court appropriately identified and relied on the state of the art as represented by studies collected and evaluated by experts in the field.

B

Lightfoot next contends that the state of the art is best ascertained by looking to the studies that underly the IARC monographs, which date from the 1960s and which, as he argues, show links between wood dust and cancer. Yet IARC, the world's expert cancer-research body, reviewed those studies in the 1980s and did not draw a general causal connection between wood dust and nasal cancer. Rather, as IARC concluded, those studies indicated a narrower connection between wood dust and cancer — that there is a causal

relationship "between the occurrence of nasal cancers in *furniture workers* and the introduction of mechanized operations that produce *high levels of wood dust*" and that there is "an increased risk of nasal adenocarcinoma among *workers in the furniture and cabinet-making industry*." (Emphasis added). Crucially, the state of the art during the early period also recognized that that association could not be made more generally, such as for those working in carpentry or lumber mills. Lightfoot gives no reason why we should not trust these conclusions and points to no study that discredits these findings.

Lightfoot's argument also implies that a manufacturer or seller — such as each defendant herein — has a duty to react to each of the many studies conducted over the years, however isolated or cutting edge. But such an argument does not take account of the applicable reasonableness standard, which imputes to a manufacturer or seller only that knowledge which it, "*in the exercise of ordinary care*," should have had. N.C. Gen. Stat. § 99B-5(a) (emphasis added). And it also does not take account of the fact that only the state of the art is imputed to manufacturers and sellers — the culmination of evidence or the synthesis of scientific studies. *See Horne*, 4 F.3d at 281; *Lohrmann*, 782 F.2d at 1164. Given IARC's superior vantage point in collecting, assessing, and evaluating *all the relevant studies and data* about whether a given material is carcinogenic, its conclusions drawn from these studies and data better reflect the state of the art than any individual study.

C

Lightfoot argues further that even were we to limit ourselves to the conclusions drawn by IARC in its 1981 monograph, we should nonetheless conclude that wood dust was then recognized as carcinogenic. He relies on several isolated statements taken from that monograph, such as:

- "There is *sufficient evidence* that nasal adenocarcinomas have been caused by employment in the furniture-making industry. The excess risks occur mainly among those exposed to wood dust."
- "The most important hazardous substances in sawmills are wood dust . . . ."
- "Cancer risks were highest for men in jobs with exposure to wood dust . . . rather than in jobs with exposure to polishes, varnishes, etc."
- "There is evidence of a link between the occurrence of nasal cancers in furniture workers and the introduction of mechanized operations that produce high levels of wood dust."

But these generalized statements are not the equivalent of a conclusion that wood dust itself is carcinogenic. While IARC indicated that the "excess risk occurs mainly among those exposed to wood dust," it did not conclude that there was a causal relationship between wood dust and nasal cancer. Indeed, IARC concluded that the evidence was *insufficient or too limited* to conclude that employment in industries other than in furniture making was causally connected to nasal cancer.

Moreover, as we have noted, the conclusions reached in the 1981 IARC monograph that linked wood dust generated in mechanized furniture-making factories and employees' nasal cancers stand in stark contrast to the 1995 IARC monograph, which concluded more broadly that there was *a causal connection* between wood dust and cancer.

D

Lightfoot also argues that the state of the art includes knowledge beyond that found in IARC materials and their underlying studies. He points to a series of materials produced by the defendants, such as a 1981 Weyerhaeuser internal "technical report" stating that the "current research . . . say[s] that some wood dusts have a tendency to promote . . . nasal cancer," but that the type of pine produced by Weyerhaeuser "has not been implicated as a wood capable of eliciting . . . nasal cancer" (emphasis omitted); a 1985 Weyerhaeuser material safety data sheet noting that "[w]ood dust has been alleged to cause nasal/paranasal sinus cancer (certainly European hardwoods, oak and beech)," but that wood dust had not been listed as a carcinogen by the NTP, IARC, or OSHA; and a 1985 Georgia-Pacific material safety data sheet stating that "[e]xposure to wood dust has been statistically associated with nasal cancer in British furniture workers," but also indicating that wood dust had not been listed as a carcinogen by the NTP. None of these statements, however, indicate that the state of the art in the 1980s was that wood dust was known to cause cancer. To the contrary, these documents describe the then-contemporary research in much the same way that IARC described it, using yet more equivocal terms, such as "tendency to promote," "been alleged," and "statistically associated." Indeed, the defendants' technical reports and data sheets were derived from the same studies that were included by IARC in its 1981 and 1987 monographs. And referring to the same research, IARC concluded that the association between wood dust and nasal cancer was tied to employment in specific mechanized industries.

Lightfoot also refers to the 1987 NIOSH review — which, like an IARC monograph, was a collection and review of studies conducted on the subject — contending that it recognized the carcinogenicity of wood dust. But again, this contention overstates the level of knowledge reported. The NIOSH review stated that "[t]he association between nasal cancer and occupations involving exposure to wood dust has been clearly established in the literature" and that this "association . . . is particularly strong among furniture workers, although other woodworkers have been shown to be at risk." Yet, the 1987 NIOSH review's recognition of *an association* between nasal cancer and occupations involving exposure to wood dust is not the same as the more general and necessary conclusion that wood dust itself causes cancer.

E

Finally, Lightfoot argues that the district court erroneously excluded the opinions of his two expert witnesses who construed the 1981 IARC monograph and the 1987 NIOSH review as concluding that wood dust was carcinogenic. The district court ruled that the experts' interpretations of the documents were irrelevant because the documents spoke for themselves. We agree. No expert is needed to understand IARC's 1981 conclusion that "[t]here is sufficient evidence that nasal adenocarcinomas have been caused by employment in the furniture-making industry [and that the] excess risk is mainly among those exposed to wood dust" (emphasis omitted), or NIOSH's 1987 observation that "[t]he association between nasal cancer and occupations involving exposure to wood dust has been clearly established in the literature." Indeed, the whole point of a state-of-the-art

inquiry is to determine what the *defendants should have known* in the exercise of ordinary care, and the best marker for that is the plain meaning of the words that they would have read, not the inferences or interpretations made by experts years later.

In addition, the court concluded that the experts' opinions were unreliable because the experts failed to explain adequately how they drew from the statements identified the conclusion that wood dust is an out-and-out carcinogen. Again we agree. As the district court explained, "neither expert offers any basis in methodology for their interpretations, other than their own statements, contrary to the statements in the 1995 monograph and contemporaneous OSHA interpretations." *Lightfoot*, 441 F. Supp. 3d at 173 n.9.

We conclude that the district court did not abuse its discretion in excluding the expert testimony that attempted merely to recast the language that the manufacturers or sellers would have read during the exposure period. *See United States v. Shea*, 989 F.3d 271, 278 (4th Cir. 2021) (recognizing the district court's discretionary "gatekeeping function to determine whether the expert evidence would be relevant and reliable" (citing *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147 (1999))).

III

To establish that Georgia-Pacific and Weyerhaeuser are liable for his cancer, Lightfoot must show that during the period from 1981 to 1992 they knew or, in the exercise of ordinary care, should have known that wood dust causes cancer but that they nonetheless failed to warn Lightfoot's father of that fact. Yet, the culmination of scientific knowledge at that time did not indicate that causal connection. It was not until years after the exposure

period that there was a settled scientific understanding that wood dust causes cancer. Accordingly, we conclude that, as a matter of law, Lightfoot has not shown that Georgia-Pacific and Weyerhaeuser had a duty during the exposure period to warn his father of the cancer risk.

The judgment of the district court is

AFFIRMED.

WYNN, Circuit Judge, concurring:

Because there are no genuine disputes of material fact and the defendants are entitled to judgment as a matter of law, I readily join the majority in affirming the district court's award of summary judgment. I write separately solely to emphasize our holding regarding the state of the art during Lightfoot's exposure period.

State-of-the-art evidence in products liability cases informs the standard of care and "helps shape the duty owed by the alleged tortfeasor." *Horne v. Owens-Corning Fiberglas Corp.*, 4 F.3d 276, 280 (4th Cir. 1993). As the majority notes, our efforts to decipher the state of the art go directly to our task of answering what duty, if any, the defendants owed. *See* Majority Op. at 8. On appeal from summary judgment, our determination of the duty owed—here, informed by the state of the art—is based on the admissible evidence provided by the parties in the case. *See Guessous v. Fairview Prop. Invs., LLC*, 828 F.3d 208, 216 (4th Cir. 2016) (explaining that at the summary judgment stage, the court is only concerned with admissible evidence in the record); *cf. Smith v. Schlage Lock Co.*, 986 F.3d 482, 489–90, 492 (4th Cir. 2021) (per curiam) (employing the summary judgment standard and assessing the duty owed by a landowner in a tort liability case by considering the evidence in the record).

Here, the admissible state-of-the-art evidence in the record includes monographs issued by the International Agency for Research on Cancer, Hazard Communication regulations promulgated by the Occupational Safety and Health Administration, and reports and data published by the National Institute for Occupational Safety and Health and the National Toxicology Program. *See* Majority Op. at 9–12. I agree with my colleagues

that these materials are insufficient for Lightfoot's case to survive summary judgment. But had the parties placed different evidence into the record, our conclusion as to the state of the art during the exposure period may have been different.

Accordingly, the question presented by this case is "whether the state of the art during Lightfoot's exposure period," *as derived from the record evidence provided by the parties*, "indicated that wood dust causes cancer such that defendants had a duty to warn Lightfoot's father about that danger." Majority Op. at 8–9; *see also id.* at 4 (noting that the district court "properly concluded *from the record* that the state of the art did not indicate that wood dust causes cancer until 1995" (emphasis added)). Answering that central question in the negative, the majority correctly affirms.