Companies Knew the Dangers of PFAS 'Forever Chemicals'—and Kept Them Secret

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3M, along with DuPont, are the targets of a new study alleging decades of covering up the dangers of PFASBELGA/AFP via Getty Images

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The female employees at the DuPont chemical company's Washington Works plant in Parkersburg, W. Va., were not given much of an explanation in 1981 when they were all abruptly moved away from any part of the factory that produced a category of chemicals then known as C8. They certainly were not told about their eight recently pregnant coworkers who had worked with C8 and given birth that year—one of them to a baby with eye defects and just a single nostril; another to a baby who had eye and tear duct defects; and a third with C8 in its cord blood.

For any employees with any doubts, the company took pains to offer reassurances that all was well. "During the period that C8 has been used at Washington Works," a memo to the staff read, "there is no known evidence that our employees have been exposed to C8 at levels that pose adverse health effects. There is a dose level where almost every chemical, even water, becomes poisonous. [C8] has a lower toxicity, like table salt."

PFAS were first developed in the 1940s and it was not until the late 1990s that the public knew about the dangers they pose. But, according to a new study published in *Annals of*

Global Health, DuPont and 3M—the leading manufacturers of the chemicals—had preliminary evidence of PFAS toxicity as early as the 1960s, and knew broadly about the dangers the chemicals pose by 1970.

These revelations of what the two companies knew about the harms of PFAS, and when, come as a result of an analysis of records on file at the University of California San Francisco's (UCSF) Chemical Industry Documents Library. The documents, in turn, were the product of discovery in two lawsuits: 1998's *Tennant vs. DuPont*, in which the plaintiff complained that DuPont dumped more than 7,100 tons of PFOA-laced sludge onto his property; and 2002's *Leach vs. DuPont*, a class action suit in which more than 80,000 West Virginia plaintiffs charged the company with contaminating the local water supply with PFOA and PFOS.

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In 2020, a team of researchers from UCSF and the University of Colorado dove into the documents, seeking to compare the industry's silence on—and in some cases direct cover-up of—the dangers of PFAS with similar actions by the tobacco and fossil fuel industries. The parallels, they found were striking, with the PFAS manufacturers suppressing unfavorable research, distorting public disclosure of research that does leak out, withholding information from employees who might be exposed to dangerous levels of PFAS, and not disclosing evidence of PFAS dangers to the Environmental Protection Agency (EPA) as required under the Toxic Substances Control Act (TSCA). All of this could ultimately figure into future PFAS-related lawsuits, both from plaintiffs alleging illnesses from exposure to the chemicals and from communities seeking remediation and clean-up of contaminated soil and groundwater. Certainly, the records examined by the researchers show that the companies knew the risks associated with the substances they were manufacturing.

"Having access to these documents allows us to see what the manufacturers knew and when, but also how polluting industries keep critical public health information private," said Dr. Nadia Gaber, an emergency medicine resident and the first author of the paper, in a statement. "This research is important to inform policy and move us towards a precautionary rather than a reactionary principle of chemical regulation."

In an email to TIME, DuPont—which has since diversified—said, in part: "In 2019, DuPont de Nemours was established as a new multi-industrial specialty products company. DuPont de Nemours has never manufactured PFOA or PFOS. DuPont de Nemours cannot comment on allegations contained in the UCSF paper that relate to historical … matters." 3M sent an emailed comment as well, stating: "The paper is largely comprised of previously published documents—as evidenced by the paper's references section, which includes citations dating back as far as 1962. 3M has previously addressed many of the mischaracterizations of these documents in previous reporting."

The Secrets Begin

It was in 1961 that the dissembling around the dangers of PFAS started. That year, as the new study details, the *Canadian Medical Association Journal* published a report of workers in PFAS factories who fell ill after smoking cigarettes that had been contaminated with PFAS-based Teflon. Shortly after, an account surfaced of a worker on a U.S. Air Force Base who

somehow came into possession of a similarly contaminated cigarette, smoked it and died on site. DuPont and the Air Force dismissed the account as a rumor—and the author of the original Canadian paper, bowing to industry and military pressure, posted a retraction, saying in part, "The Union Carbide Corporation, upon further investigation, and with the cooperation of DuPont, reported in December of last year, 'there have been no deaths or permanent injuries known to stem from Teflon; all rumors of death are false.'"

But DuPont knew better. In 1962 a company scientist conducting in-house studies on Teflon that were not released to the public conceded that the substance may be reactive to excessive heat and handling. "Teflon may not be so inert," the scientist concluded. A non-industry paper in 1965 showed that Teflon was associated with "an epidemic of polymer fume fever," an inhalation fever that occurs when Teflon is heated to 300° C (572° F). DuPont remained silent on those findings.

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That wasn't all the companies were learning about the products they were manufacturing. A 1961 DuPont study found that Teflon exposure led to liver enlargement in rats, with the in-house scientist recommending that the material should be handled "with extreme care" and that "contact with the skin should be strictly avoided." In 1970, researchers at the Washington Works plant found that C8—or PFOA and PFOS—could be "highly toxic when inhaled and moderately toxic when ingested." These findings were not made public either. A 1979 industry study showed opacity in the corneas of rats exposed to PFAS; and industry studies in 1979 and 1981 showed liver degeneration in rats fed both high and low doses of PFAS.

Among the human studies the companies conducted, in 1994 researchers found that the half-life of C8 in the blood of employees was 1.5 to three years. The researchers nonetheless concluded from that same study that "no adverse health effects were found in 3M workers in a study of liver function in DuPont Washington Works." But they added, "a possible increase in prostate cancers" had been reported at a different 3M plant manufacturing C8. Other findings among employees showed elevated liver enzymes in 61% of 30 workers tested, indicating inflammation and damage to cells in the liver; and both 3M and DuPont found elevated fluorine—a marker of PFAS—in the blood of employees. The higher the level of fluorine, the higher the level of PFAS, and the greater the risk of all of the illnesses associated with the chemicals.

Other industry and non-industry studies from 1988 to 2020 showed a range of additional ills associated with PFAS, including testicular adenomas—or non-malignant growths; neurological damage; metabolic dysfunction; and fertility problems.

Working the Public

As the evidence of the dangers of PFAS mounted—both from company research and independent studies—3M and DuPont began covering up what they were learning, describes the new study.

In 1991, researchers unaffiliated with the companies began detecting PFAS in ground water. The companies responded with a joint press release stating: "According to studies by DuPont

and 3M Corporation, C8 has no known toxic or ill health effects in humans at concentration levels detected."

In 2000, health officials in Lubeck, W. Va., found that several forms of PFAS, including C8, were present in the local drinking water. In response, DuPont reassured the officials that all was well. The officials repeated the company line publicly, stating that, "DuPont reports that it has toxicological and epidemiological data to support confidence that exposure guidelines established by DuPont are protective of human health."

But by now, the genie was out of the bottle. Researchers unaffiliated with the companies were publishing more and more studies on the risks of PFAS linking it to increased risk of certain cancers and other ills; the *Tennant* case had already been adjudicated and the *Leach* case was coming. And in 2000, 3M even announced it would no longer be manufacturing the PFAS-based fabric-protecting Scotchguard. In an in-house email discussing the announcement, a DuPont attorney acknowledged that the chemical is "too persistent in the environment and gets into our blood." He added, "The plant recognizes it must get public first…better late than never."

In 2002, after Leach was adjudicated, a DuPont vice president tried to enlist help from an unlikely source: the EPA. "Urgent: EPA action needed," the vice president wrote to the agency. "We need the EPA to quickly (like first thing tomorrow) say the following…Consumer products sold under the Teflon brand are safe [and] there are no human health effects known to be caused by PFOA." The EPA did not accommodate the company's request.

By now, of course, the dangers of PFAS are well known, with the chemical turning up in all manner of previously unexpected places, including toilet paper, menstrual products, and contact lenses. The EPA has already regulated permissible levels of PFOA and PFOS in drinking water, and is working to add six more types to that list by 2026. Public demand is leading to a growing market for PFAS-free products, leaving companies like DuPont and 3M either to abandon—or at least curb—the chemicals or get left behind. As for the companies' reputations, studies like the just-released one might make cleaning them up a difficult job.

"These documents reveal clear evidence that the chemical industry knew about the dangers of PFAS and failed to let public regulators, and even their employees know the risks," said Tracey Woodruff, director of the UCSF program on reproductive health and senior author of the paper, in a statement. "As many countries pursue legal and legislative action to curb PFAS production, we hope they are aided by the timeline of evidence presented in this paper."

Correction: The original version of this story misspelled the name of the senior author of the paper. It is Tracey Woodruff, not Tracy Woodruff.