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In mayor race: 'Let police be police'

'Not on my watch,' Lightfoot says of opponents' campaign refrain

By Alice Yin and Gregory Pratt | Chicago Tribune

Inside a Southwest Side veterans' hall with swift-spinning ceiling fans and a rapt audience, Ald. Raymond Lopez recently made his pitch on how to deal with high crime.

Beat officers patrolling neighborhoods need to be aggressive engaging "problem characters" or anyone who looks like they are up to criminal behavior, Lopez said, as the crowd of residents, some of whom identified themselves as former Chicago police members, applauded.

"It's not racial profiling. It's not harassment," Lopez added. "It's called officers knowing how to do their job because they know whether or not you belong here. They know whether or not you've got a rap sheet that's seven pages long. They know whether or not you are selling drugs."

Businessman Willie Wilson made a similar argument at a downtown banquet where he promised to "take the handcuffs off" police and loosen restrictions on their activity, including new rules about foot chases.

"They have to be free to do their job and protect us all," Wilson said.

Former Chicago Public

Turn to Police, Page 4

Police work the scene where a person was killed Wednesday on East 75th Street. **TERRENCE ANTONIO JAMES/TRIBUNE**

TRIBUNE INVESTIGATION FOREVER CHEMICALS

SUSPECT SLUDGE

Sewage spread as fertilizer on Chicago-area farmland contains toxic chemicals

By Michael Hawthorne | Chicago Tribune

Ray Dettmering didn't think twice after a salesman knocked on his door a decade ago and offered the Will County farmer as much free fertilizer as he wanted.

Instead of paying for nitrogen and other crop-stimulating nutrients, Dettmering began welcoming truckloads of sewage sludge — a byproduct of human and industrial waste from Chicago and the Cook County suburbs.

"It might not smell that great," said Dettmering, who farms near Crete, Matteson and University Park. "You don't get something for nothing very often, though."

Dozens of other farmers on the edges of suburbia are doing the same thing. They are encouraged to spread sludge on their fields by local officials, farm bureaus, university extension agents — even the U.S. Environmental Protection Agency.

But despite assurances the practice is safe and legal, sewage sludge is contaminating thousands of acres of northeast Illinois farmland with toxic forever chemicals, a Chicago Tribune investigation has found.

Forever chemicals, also known as per- and polyfluoroalkyl substances or PFAS, have been widely used for decades in firefighting foam and to make products such as nonstick cookware, stain-repellent carpets, waterproof jackets and fast-food wrappers that repel oil and grease.

When human excrement and industrial waste is flushed into sewers, conventional treatment not only fails to screen out PFAS, it concentrates the chemicals in sludge.

Most of the fetid muck is dumped on farmland. During the past six years alone, federal records show, more than 615,000 tons of sludge from the Metropolitan Water Reclamation District of Greater Chicago has been plowed into 29,000 acres near the nation's third largest city. (All of that land combined is roughly the size of west suburban Aurora.)

Only the Greater Los Angeles area distributed more sludge to farmers between 2016 and 2021.

Researchers and public health advocates are increasingly concerned because some PFAS build up in human blood, take years to leave the body and don't break down in the environment. Others transform over time into more hazardous compounds,

Turn to Chemicals, Page 8

Sludge from the Metropolitan Water Reclamation District is dumped and spread on land farmed by Ray Dettmering on June 15 in Will County. **ERIN HOOLEY/ CHICAGO TRIBUNE**

Reclusive artist's works in federal court fight

Estate sues landlords over Darger's legacy

By Jason Meisner
Chicago Tribune

Recluse janitor Henry Darger spent more than 40 years in a tiny one-room apartment in Lincoln Park, writing, painting, sketching, collecting and fantasizing.

It wasn't until after his death in 1973 that his works, discovered by his landlords, trickled onto Chicago's art scene, with his fanciful stories and sometimes-violent imagery eventually gaining worldwide appreciation — and skyrocketing value.

Now, nearly a half a century later, a brewing legal battle over the rights to Darger's legacy has landed in Chicago's federal court, where a lawsuit was filed this week by his estate accusing the landlords of copyright infringement.

The lawsuit filed in U.S. District Court on Wednes-

Turn to Darger, Page 6

This photo shows Henry Darger's apartment at 815 W. Webster Ave. and was taken when his works were discovered, shortly before his death in 1973. **U.S. DISTRICT COURT RECORDS**

The maven of mystery

At 75, Sara Paretsky, the pioneering Chicago crime writer, has changed — but she doesn't plan to stop writing books featuring V.I. Warshawski. **A+E**

Summer of COVID caution

As we navigate another season in a seemingly never-ending pandemic, officials urge people to take latest variant seriously. **Life+Travel**

Tom Skilling's forecast High **86** Low **69**

Chicago Weather Center: Forecast on Page 22

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FOREVER CHEMICALS

Farmer Ray Dettmering checks a soybean field on July 22 in Will County. Dettmering uses sludge from the Metropolitan Water Reclamation District as fertilizer. **ANTONIO PEREZ/CHICAGO TRIBUNE**

Chemicals

from Page 1

increasing the risk that grains, beans, hay and produce grown in sludge-amended soil could be tainted for years to come.

Long-term exposure to tiny concentrations of certain PFAS can trigger testicular and kidney cancer, birth defects, liver damage, impaired fertility, immune system disorders, high cholesterol and obesity, studies have found. Links to breast cancer and other diseases are suspected.

Yet forever chemicals remain largely unregulated.

In Illinois and most other states, there is no requirement to test sludge for PFAS before it is spread as fertilizer. Nor are there limits on concentrations of the chemicals in sludge or soil.

Operators of most of the nation's sewage treatment plants aren't even required to warn farmers about the risks.

"Everybody wants to pretend it's not happening," said David Wallinga, a physician and senior health, food and agriculture officer at the nonprofit Natural Resources Defense Council.

Sludge from the Metropolitan Water Reclamation District is dumped and spread on land farmed by Ray Dettmering on June 15 in Will County. **ERIN HOOLEY/CHICAGO TRIBUNE**

Crops and livestock

The Metropolitan Water Reclamation District or MWRD, an independent, taxpayer-financed agency that manages sewage from Chicago and the rest of Cook County, has known for more than a decade that its sludge is contaminated with forever chemicals, according to studies reviewed by the Tribune and records obtained through Freedom of Information Act requests.

In 2011, a peer-reviewed study of farmland fertilized with the district's sludge found some of the highest concentrations of PFAS detected to date in agricultural fields nationwide.

The most contaminated field in the study, south of Peoria in Fulton County, is among 13,500 acres of strip-mined land the MWRD bought during the early 1970s and reclaimed by covering it in sludge until 2004. Nearly 40% of the land is leased to farmers who graze cattle or grow corn, hay, soybeans and wheat, according to district records.

Other fields sampled in Fulton, Kankakee and Will counties had been fertilized with less sludge during shorter periods of time. Each was contaminated with forever chemicals at levels exceeding newly adopted EPA guidelines intended to protect underground sources of drinking water, data from the study shows.

European researchers concluded in 2018 there is ample evidence in the scientific literature that forever chemicals end up in plants eaten by people or fed to dairy cows and livestock butchered for meat.

The amount of PFAS absorbed by plants depends on the specific chemical, plant type and soil properties, the researchers reported after reviewing dozens of studies published during the previous decade.

One of the studies analyzed field corn, lettuce and tomatoes grown in soil fertilized with MWRD sludge.

Corn kernels had relatively low concentrations of PFAS, the study's authors found. Higher levels of the chemicals were detected in corn stalks that are fermented and fed to livestock as silage. Lettuce and tomatoes absorbed newer versions of PFAS but not much of the compounds that first alarmed scientists.

"We need to consider the fact that these chemicals can get into our food," Chris Higgins, senior author of both MWRD sludge studies, said last year during a workshop organized by the nonprofit Institute for Journalism and Natural Resources.

Higgins, a professor of civil and environmental engineering at the Colorado School of Mines, said more study is needed to determine how much of the PFAS in people comes from sludge-tainted plants and livestock.

Drinking water is considered the chief source of exposure. The Tribune's ongoing investigation revealed this month that more than 8 million Illinoisans — 6 of every 10 people in the state — get their drinking water from a utility where at least one forever chemical has been detected.

If PFAS are in sludge applied to farmland, the chemicals can leach into public and private wells. There is effectively no safe level of exposure to the most widely studied PFAS in drinking water, the EPA announced in June.

Dietary exposure is less understood but has been a concern since at least 2001, when one of the chief manufacturers of PFAS, Minnesota-based 3M, found elevated levels of the chemicals in apples, bread, ground beef and milk.

Based on what researchers have discovered since then, Higgins said, "food exposures can be important."

Downplaying risks

In memos to the MWRD's elected commissioners, officials at the district's headquarters in Chicago have repeatedly downplayed the risks of spreading sludge on farmland.

The district calls its sludge "biosolids," a euphemism adopted by the nation's sewage treatment industry during the early 1990s in an attempt to blunt opposition to using the waste as fertilizer. (Other candidates included Bioslurp, Black Gold, Geoslime and Humanure.)

"There is no shot clock, no deadline, to clean up these chemicals once they've been released into the environment. Nor is there a requirement that EPA continue with efforts to set limits on industrial releases or in drinking water and sludge."

— Scott Faber, a senior vice president at the nonprofit Environmental Working Group

One of the contractors hired by the district to bring sludge to farmers promotes the waste as "organic" fertilizer.

Chances are slim that forever chemicals accumulate in vegetables, top MWRD officials wrote in memos sent during 2016 and 2019. PFAS levels in the district's sludge are "extremely low," one of the memos assured the commissioners.

Other memos show the district's leaders are worried the MWRD could be held liable by courts, juries and the federal government if the EPA declares forever chemicals are hazardous under the Superfund law, which enables the agency to require polluters to clean up contaminated properties.

"The paramount challenge that the district currently faces is how to deal with the negative public perception and concerns about land application of biosolids containing PFAS," Brian Perkovich, the MWRD executive director, wrote in an Oct. 9, 2019, memo stamped "confidential."

Through a spokesperson, Perkovich and other district officials canceled a scheduled interview with the Tribune and asked for questions in writing.

Some studies suggest food packaging and household dust from PFAS-laden consumer products are more significant sources of exposure than crops fertilized with sludge, district officials argued in an email response to the newspaper's questions. They also stressed the district's sludge meets current federal standards, omitting the fact there are no nationwide limits on forever chemicals in sludge.

"At this point in time, the district has no reason to believe that its biosolids pose a risk to human health, and, therefore, does not require contractors to notify farmers about the trace levels of PFAS," the email said.

'No deadline'

Others aren't so sure. Prodded by Congress and the public, the EPA announced last year it is studying forever chemicals in sludge as part of the Biden administration's "PFAS Strategic Roadmap."

"Through this collaboration with other federal agencies, we are working to identify and characterize routes of PFAS exposure, understand associated health risks and reduce the public's exposure to PFAS that may pose a health risk," the EPA said in a statement emailed to the Tribune. "A critical element of this work is assisting state and local agencies in their efforts to address issues involving PFAS in agricultural products including human and animal food."

The EPA's inspector general condemned the agency in 2018 for failing to evaluate the hazards of PFAS and dozens of other unregulated chemicals in sludge. By not being upfront with Americans about the uncertainty, the agency's internal watchdog concluded, the EPA's sludge program "is at risk of not achieving its goal to protect public health and the environment."

Scott Faber, a senior vice president at the nonprofit Environmental Working Group, noted that Democratic and Republican presidential administrations since the early 2000s have failed to follow through on promises to address PFAS hazards.

The EPA under President Donald Trump outlined an ambitious research and regulatory campaign at the same time his administration pushed to cut the agency's funding and workforce. EPA officials during Trump's four years in office continued to approve new PFAS without determining if they are safe.

"There is no shot clock, no deadline, to clean up these chemicals once they've been released into the environment," Faber said in an interview. "Nor is there a requirement that EPA continue with efforts to set limits on industrial releases or in drinking water and sludge."

Some states aren't willing to wait for national standards that would take years to adopt — or might not be coming at all.

In April, Maine Gov. Janet T. Mills signed bipartisan legislation banning the spread of sewage sludge on land within the state. Lawmakers moved to outlaw the practice after state officials found worrisome levels of PFAS in drinking water, soil, milk, livestock and venison. High levels of the chemicals have been detected in the blood of Maine farmers and their families.

Before banning sludge spreading outright, Maine enacted standards for three forever chemicals in sewage-based fertilizer. All but a handful of the state's treatment plants violated the standards.

Sludge and compost from the Chicago-area sewage district would fail to meet the Maine standards as well.

Samples collected by the MWRD in 2019 contained up to 53 parts per billion of a forever chemical known as perfluorooctane sulfonic acid (PFOS) and 27 ppb of a related substance called perfluorooctanoic acid (PFOA), according to a spreadsheet obtained by the Tribune. The chemicals once were used for Scotchgard and Teflon branded products.

Levels of the chemicals in sludge and compost from Chicago and Cook County were more than 10 times higher than what the Maine standards allowed.

An earlier analysis of MWRD sludge spread on farmland found significantly higher levels of PFOS — up to 219 ppb — in samples collected between 2004 and 2007, suggesting some fields in the collar counties outside Chicago are more contaminated than others.

The scope of the problem remains unknown because the sewage district isn't required to test every field that is fertilized with its sludge.

Dettmering, the Will County farmer, said he didn't know about PFAS prior to a conversation with the Tribune. Decisions about how much sludge is applied to a particular field are made by the MWRD contractors that distribute the waste and till it into the ground,

he said.

"I don't have to touch it or even look at it," Dettmering said. "That's great because I'm saving on diesel (fuel) and avoiding wear and tear on my equipment."

'Chasing a ghost'

During the past six years, Illinois ranked second among the states for the amount of sludge dumped on farmland, according to federal records. Only California, where sewage districts sent 3.7 million tons to farmers, topped the 1.1 million tons spread on Illinois farms.

The Illinois EPA told the Tribune it is up to the U.S. EPA to determine if the practice endangers the state's residents. By contrast, two other Midwest states, Michigan and Minnesota, decided years ago not to wait for the federal government to act.

Based on what Michigan officials have learned since 2017, the state bans sludge spreading if PFOS levels exceed 125 parts per billion. At treatment plants with levels above 50 ppb, operators are required to notify farmers, test annually for the chemical and take steps to reduce concentrations in their sludge.

Michigan treatment plants with the highest levels of PFOS, the former Scotchgard chemical made by 3M, have reduced concentrations in sludge by up to 98% since the state ordered operators to trace industrial discharges into sewer systems and clamp down on the pollution, according to a report released in April.

"We are striving for the lowest possible PFOS levels," said Abigail Hendershott, executive director of the Michigan PFAS Action Response Team, organized by former Gov. Rick Snyder in 2017 to coordinate the efforts of seven state agencies.

Minnesota last sampled sludge during 2010. Like their counterparts in Michigan, officials at the Minnesota Pollution Control Agency had early successes reducing PFAS concentrations in some of the most contaminated cities.

"Chasing PFAS can sometimes feel like chasing a ghost," the Minnesota agency says on its website. "We have learned that much more work would be needed to get to the necessary levels of prevention and protection."

Michigan and Minnesota reduced PFAS concentrations by adding the chemicals to a program that requires industry to filter and safely dispose of heavy metals before discharging waste into sewers. The MWRD has its own pretreatment program for metals. But Perkovich, the district's executive director, told elected commissioners in 2020 there is "no sound basis" to include PFAS.

The district is just now attempting to figure out where forever chemicals are coming from in Chicago and Cook County, emails and memos show.

In Maine, the state's Center for Disease Control and Prevention concluded that merely reducing PFAS in sludge might not protect people from health risks.

Maine adopted screening levels that trigger more investigation when PFAS testing detects certain concentrations in beef, fish, hay, milk, silage and soil. Each screening level is based in part on a now-defunct EPA health advisory of 70 parts per trillion of PFOS and PFOA combined in drinking water.

Trade organizations representing sewage treatment operators contend the Maine standards are far too stringent, calling them "inappropriately low" and "nonscientific."

"The mere presence of PFAS in biosolids, even at trace levels, is causing some state regulators and, at times, the public to react in fear and prematurely limit local options," the National Association of Clean Water Agencies said in a June policy statement.

Yet the U.S. EPA's announcement last month that PFOA and PFOS are unsafe at practically any level suggests the agency's failure to regulate forever chemicals in sludge could be endangering millions of Americans.

"It's probably going to cost more money to landfill sludge instead of spreading it on farmland," said Patrick MacRoy, deputy director of the Maine nonprofit group Defend Our Health. "But there are a hell of a lot of benefits to not having contaminated milk and crops."

'A national solution'

The MWRD once dumped most of its sludge in landfills on Chicago's Southeast Side. Disposal became more expensive for all of the nation's sewage treatment plants during the late 1970s after Congress ordered more stringent regulation of landfills, and costs increased again during the early 1990s when federal lawmakers outlawed the dumping of sludge into oceans.

Giving away sludge to farmers became the cheapest option for many cities.

Promotional materials from public works agencies, industry lobbyists and the EPA highlight the plant-friendly qualities of sludge. Some researchers also have become champions of spreading the waste on farmland.

"I can show you fields where plants love biosolids," said Linda Lee, an environmental chemistry professor at Purdue University who leads or is involved in several sludge studies funded by the EPA and the sewage treatment industry. "Banning biosolids is not a sustainable alternative."

Echoing statements from industry lobbyists, Lee said the solution is to keep forever chemicals out of sewers in the first place. "What we should be doing right now is getting rid of sources and then regulating nonessential uses of PFAS out of the marketplace," she said.

In December, a University of Arizona researcher sent an email to sewage districts across the country urging them to contribute tax dollars for a broad study of PFAS in sludge.

"We need a national solution," wrote Ian Pepper, a professor of environmental science and public health. "I hope you will consider this proposal as a national ban of land application is a real threat."

An MWRD researcher serves on an advisory committee organized by Pepper. At the local official's request, an association of Illinois sewage treatment agencies chipped in $5,000 for the professor's study.

"If you don't get to land-apply biosolids, what are your other two options? Incineration or landfilling," Pepper said in an interview. "Neither is a really good idea."

That said, Pepper and Lee agreed that sludge contaminated with certain, but still undefined, levels of PFAS should not be spread on farmland.

Cameron Davis, one of the MWRD's elected commissioners, has been pressing the district's staff to address the PFAS dilemma.

"Public utilities across the country didn't create this problem, but they're forced to deal with it in ways that put the screws to all of us," said Davis, who coordinated efforts to restore and protect the Great Lakes during the Obama administration. "I know two things for sure: Protecting public health comes first, and manufacturers need to be held accountable instead of taxpayers.""

'Still out there'

Without more widespread testing, it remains unclear if horrifying scenarios documented in recent years are unusual, as the sewage treatment industry insists, or more common than anyone realizes.

At the end of January, Michigan ordered a farmer outside Detroit to stop selling beef to schools and other customers after state officials found alarming levels of PFOS in hay, silage and water fed to his cattle. The farmer had fertilized some of his land with sludge from a nearby treatment plant where the state detected high levels of the forever chemical during 2018.

Michigan officials told the Tribune that PFOS concentrations in the farm's beef weren't as high as what the federal government has found in other parts of the country but were still concerning because "prolonged exposure to PFOS may be a public health risk."

In Maine, at least a dozen farmers have been sidelined because their milk or vegetables or crops are contaminated.

Adam Nordell and Johanna Davis grew organic vegetables and grains on land the couple owned or leased about 20 miles from the Atlantic coast.

They called their venture Songbird Farm. The first parcel Nordell and Davis bought in 2014 already was an organic farm. By last year their sales to markets on the coast were robust enough they decided to drill a new irrigation well and made plans to open a bakery with goods made from the farm's grains.

But after a customer told Nordell last fall about the state's emerging PFAS problems, he found an online map that showed Songbird Farm had been fertilized with sewage sludge during the early 1990s, years before Nordell, Davis and the previous owner had tilled the land.

Unwilling to wait for the state to collect and analyze samples, Nordell and Davis paid to have their soil, spinach and water tested. A contract laboratory detected PFAS in every sample; levels in the farm's water were 400 times higher than state standards.

"We had been growing heritage, or niche, varieties of wheat, rye, oats and corn, some dry beans as well," Nordell said in an interview. "We had 10 or 15 different vegetable crops ranging from lettuce, kale and spinach to fruiting crops like tomatoes and peppers."

All of the couple's efforts ground to a halt at the end of 2021.

Nordell and Davis told customers what the PFAS testing had found on the farm and suspended operations. Then they had themselves tested.

Levels of PFAS in the couple's blood were 250 times higher than the average American, Nordell said, noting that workers in some industrial settings are less contaminated than he and his wife.

The Maine couple's experience is a cautionary tale about modern farming in the United States.

"What is a corn field today could be housing at some point, with PFAS in the ground where children play and in the drinking water wells poking into contaminated groundwater," said Nordell, who in June joined the Maine nonprofit Defend Our Health as an advocate for the state's farmers. "These chemicals don't go away. They are still out there, waiting for us."

Nordell, 39, lamented that based on what scientists know about the chemicals, he will be in his 70s by the time the PFAS coursing in his blood leaves his body.

Asked if he and Davis want to return to farming, Nordell paused for several seconds.

"My heart is broken," he said haltingly. "The things that motivated me to farm feel meaningless in light of the contamination. It's difficult to justify all of our hard work when this is the outcome."

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An aerial view shows the Stickney Water Reclamation Plant, operated by the Metropolitan Water Reclamation District, on April 12 in Cicero. The MWRD has known for more than a decade that its sludge is contaminated with forever chemicals. **ERIN HOOLEY/CHICAGO TRIBUNE**

Farmer Ray Dettmering checks on a sprayer outside his home in Peotone on July 22. Dettmering said he didn't know about toxic forever chemicals before a conversation with the Tribune. **ANTONIO PEREZ/CHICAGO TRIBUNE**

Adam Nordell, Johanna Davis and their son at Songbird Farm in Unity, Maine, on March 22. The couple bought their farm seven years ago but suspended operations in late 2021 after discovering their land and water is contaminated with high levels of forever chemicals, also known as per- and polyfluoroalkyl substances or PFAS.
BRIANNA SOUKUP/FOR THE WASHINGTON POST

"It's probably going to cost more money to landfill sludge instead of spreading it on farmland. But there are a hell of a lot of benefits to not having contaminated milk and crops."

— Patrick MacRoy, deputy director of the Maine nonprofit group Defend Our Health

FOREVER CHEMICALS

Researchers urge doctors to test patients for PFAS

Chemicals could cause nearly $63B in hidden health costs in US

By Michael Hawthorne
Chicago Tribune

The 3M plant in Cordova, Illinois, on May 10, 3M is one of the chief manufacturers of PFAS and has known since 1975 that forever chemicals had been detected in blood banks around the United States, according to industry records uncovered during lawsuits. **BRIAN CASSELLA/CHICAGO TRIBUNE**

Physicians should test millions of Americans for toxic forever chemicals, the nation's leading scientific advisory body urges in a new report that reflects growing concerns about unregulated compounds added to clothing, food packaging and household products.

A panel of researchers organized by the National Academy of Sciences concluded that pregnant women and other sensitive groups should be screened for breast cancer, unhealthy cholesterol levels and high blood pressure when the amount of forever chemicals in their blood exceeds 2 parts per billion — equivalent to a couple of drops of water in a swimming pool.

Every American with more than 20 ppb in their blood should be checked for signs of other diseases as well, including thyroid disorders, kidney and testicular cancer and ulcerative colitis, panel members said Thursday in their recommendations to the Centers for Disease Control and Prevention.

New guidelines for the nation's doctors came the same week another group of researchers estimated that exposure to forever chemicals — also known as per- and polyfluoroalkyl substances or PFAS — could cost the current U.S. population nearly $63 billion in hidden health costs.

There are more than 9,000 PFAS, of which about 600 are in commerce today, according to the U.S. Environmental Protection Agency. The chemicals have been widely used for decades in firefighting foam and to make products such as nonstick cookware, stain-repellent carpets, waterproof jackets and fast-food wrappers that repel oil and grease.

Blood tests are recommended for anyone exposed on the job or who has lived in communities with documented sources of PFAS contamination. Others are advised to get tested if they have lived near airports, military bases, sewage treatment plants or farms where sewage sludge may have been used as fertilizer. Living near a landfill or waste incinerator also increases the risk of exposure to forever chemicals, according to the national academy panel.

Based on the latest human and animal research, "we feel the closer to 2 (parts per billion) that people are the less likely they are to have adverse health effects, and the closer to 20 (ppb) the more likely," said Ned Calonge, the panel's chairman and a physician, epidemiologist and associate professor of family medicine at the University of Colorado.

The CDC determined during the late 2000s that forever chemicals are in the blood of virtually every American. But routine testing is still rare. Most people don't know how much PFAS is coursing through their circulatory system unless they work for chemical manufacturers that routinely monitor employees.

Two of the mostly widely detected forever chemicals — perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) — are so dangerous there is effectively no safe level of exposure in drinking water, the EPA announced in June.

An ongoing Chicago Tribune investigation revealed this month that more than 8 million people in Illinois — 6 out of every 10 people in the state — get their drinking water from a utility where at least one forever chemical has been detected. PFOA and PFOS are in the water of nearly every community where testing by the Illinois EPA found the chemicals.

"The entire U.S. population is likely overexposed to these toxic PFAS," said David Andrews, a senior scientist at the Environmental Working Group, a nonprofit research organization that has advocated for federal regulations since the early 2000s. "Clinicians should advise their patients to reduce their exposure to these forever chemicals as much as possible — a difficult feat, since they are ubiquitous."

It almost assuredly will take time and considerable debate before testing people for PFAS becomes commonplace.

Spokespeople for Northwestern Medicine and University of Chicago Medicine said they were unaware of any physicians in their networks who are testing patients for the chemicals. The Chicago-based American Medical Association did not respond to a request for comment.

During public forums the National Academy of Sciences held across the country last year, several participants said physicians scoffed when asked about PFAS testing.

"Clearly they didn't have any information about environmental components (of disease)," a Pennsylvania woman said at one of the forums. "They made me feel small; they made me feel stupid and embarrassed for even asking the question."

One of the chief manufacturers of PFAS, Minnesota-based 3M, has known since 1975 that forever chemicals had been detected in blood banks around the United States, according to industry records uncovered during lawsuits.

Regulators and the public were kept in the dark until 1998, when a 3M executive informed the U.S. EPA for the first time that PFAS used to manufacture the company's Scotchgard coatings, and Teflon made by DuPont, build up in human blood, take years to leave the body and don't break down in the environment.

PFOA and PFOS no longer are made in the U.S. In a statement, a 3M spokesman said levels of PFAS found in the environment do not pose risks to humans.

Based on what researchers are finding, though, the chemicals 3M, DuPont and other manufacturers released into air, water and land for more than 70 years could endanger public health for decades to come. Some of the replacements for PFOA and PFOS are just as dangerous, if not more so, studies have found.

A team of researchers at New York University estimated the costs of PFOA and PFOS exposure by plugging the most scientifically rigorous disease studies into a computer model that calculates the price of medical care and lost wages due to illness.

They based the low end of their estimates — $5.5 billion — on the strongest links between exposure and disease. When they added research suggesting other health damages caused by forever chemicals, the projected cost swelled to $62.6 billion.

"This is a giant uncontrolled experiment on the public," Leo Trasande, a researcher at the NYU Grossman School of Medicine and the study's senior author, said about the spread of PFAS worldwide.

Left unanswered by both of the new studies is who pays for testing, treatment and cleanup.

Cincinnati attorney Rob Bilott already has won PFAS legal settlements against DuPont in Ohio and West Virginia. Now he is among a group of trial lawyers suing 3M, DuPont and other manufacturers in an effort to force the companies to pay for medical monitoring of every American exposed to forever chemicals.

In March, a federal judge limited the case to Ohio residents with a specific amount of the chemicals in their blood, which alone could include up to 11 million people. Chemical companies are appealing the decision.

"The public — those of us exposed to these poisons for decades without our knowledge and consent — should not bear the cost of the public health impacts when we already know exactly which companies caused this problem," Bilott said in an email. "It is way past time to hold those responsible for the public health disaster they have caused."

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