

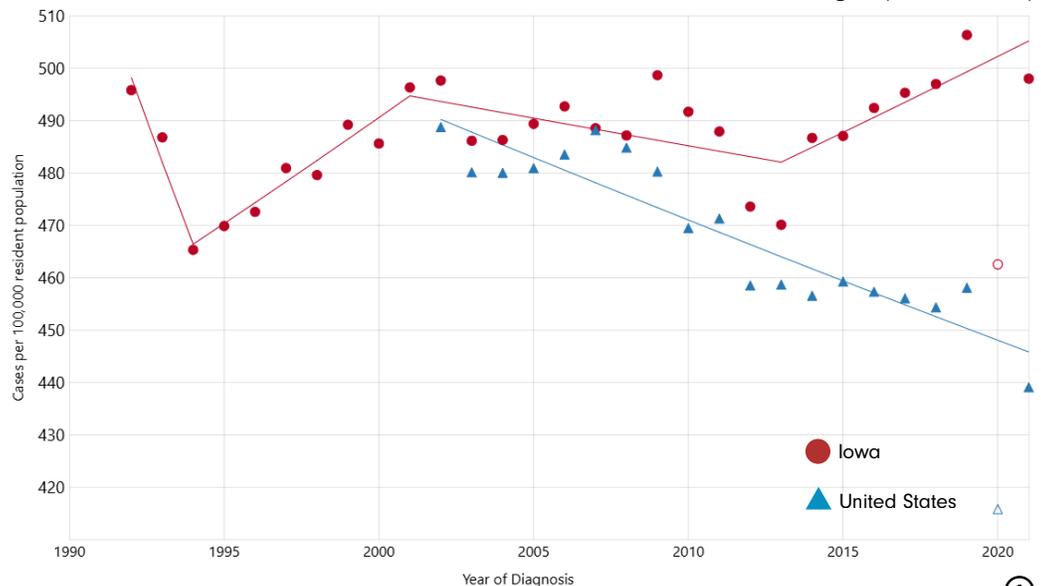
ENVIRONMENTAL RISK FACTORS AND IOWA'S CANCER CRISIS

EXECUTIVE SUMMARY

Iowa is an outlier for cancer.

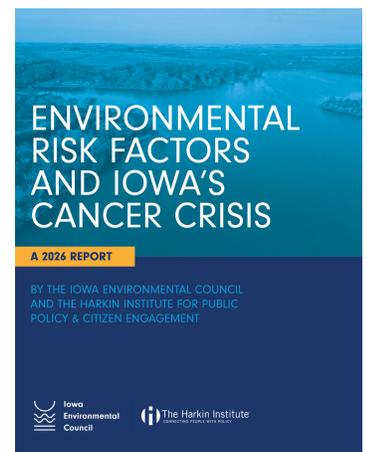
Iowa has the second-highest cancer incidence rate in the nation and is one of only two states where the rate is rising. While the U.S. has a declining overall cancer rate, Iowa's is sharply increasing. More than 170,000 Iowans share the experience of living with a past or current cancer diagnosis, and many more have lost loved ones to cancer.

Cancer Incidence in Iowa and the United States, All Ages (1992 - 2021)



The “Environmental Risk Factors and Iowa’s Cancer Crisis” report was developed by the Iowa Environmental Council and The Harkin Institute based on feedback from hundreds of Iowans who are asking: What makes Iowa an outlier for cancer? What is unique about our state? While there is public awareness that behavioral factors such as smoking, alcohol consumption, and exposure to UV light from the sun or tanning beds can cause cancer, environmental factors – what is in our water, soil, and air – are discussed far less. (Read more about how the larger project was developed on page 7.)

Iowa has some of the highest nitrate levels in drinking water in the U.S., extensive and intensive pesticide use, elevated radon concentrations in homes, and emerging concerns about PFAS contamination. Iowans deserve to know what risks we are facing. We cannot escape what has been allowed to contaminate the environment in which we live.



All Iowans deserve to live long and healthy lives. Now is the time to act on preventable environmental risk factors that threaten our health and well-being.

Get the full report, additional maps, citations for all information and graphics, plus other resources by scanning the code or visiting iaenvironment.org/cancerproject

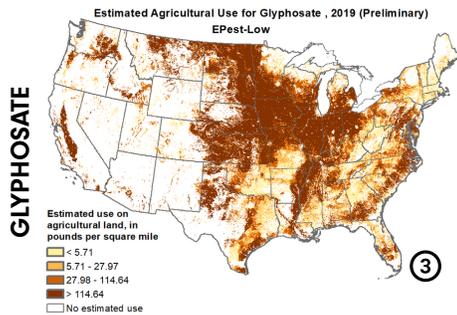


ENVIRONMENTAL RISK FACTORS AND IOWA'S CANCER CRISIS

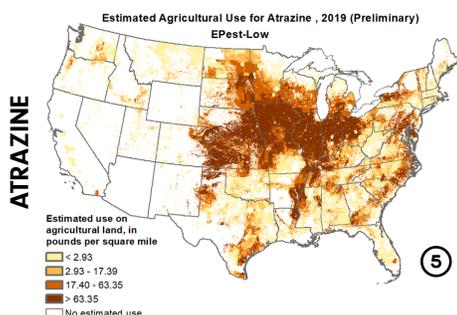
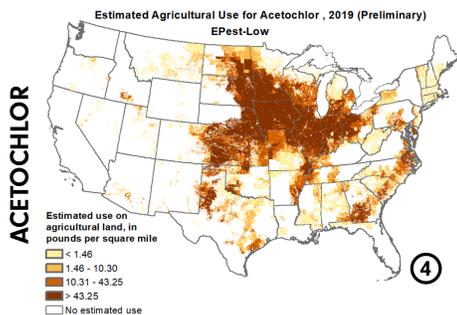
EXECUTIVE SUMMARY: PESTICIDES

Iowa's intensive agriculture footprint results in some of the highest pesticide application rates in the nation.

Pesticides, including herbicides, fungicides, insecticides, and rodenticides, can remain in the environment for decades and can bioaccumulate in people and animals. Iowans come into contact with pesticides through drinking water, food residues, pesticide drift from fields, house dust, and occupational exposure. This report examines the top three most applied pesticides in Iowa: glyphosate, acetochlor, and atrazine.



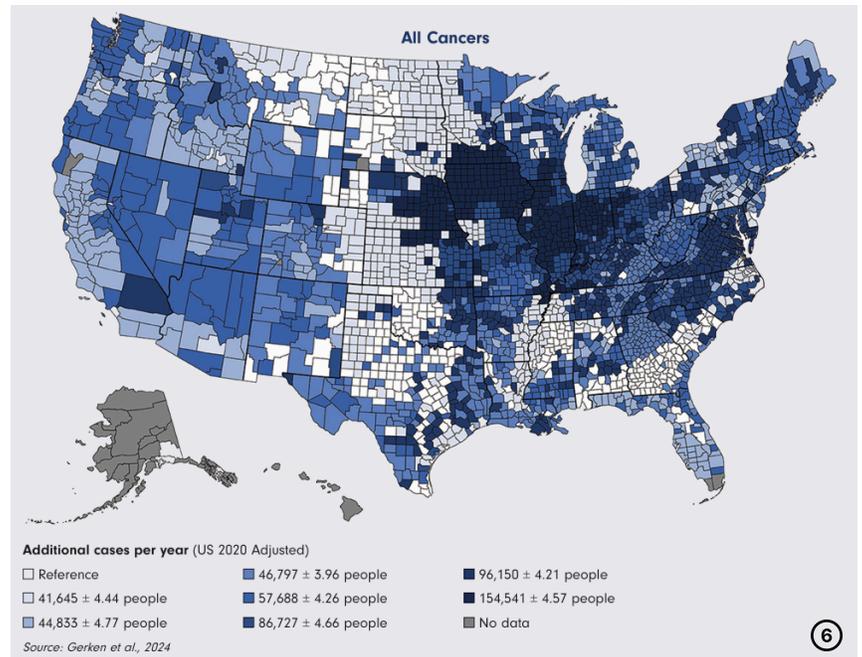
Figures 3 - 5 show estimated agricultural use of the top three most applied pesticides in 2019. Figure 6 represents cancer cases attributable to pesticide use in 2024.



Scientific studies associate pesticides with elevated risks of prostate, lung, breast, colorectal, bile duct, pancreatic, pharyngeal, kidney, ovarian, and bladder cancers as well as non-Hodgkin lymphoma and leukemia. Many pesticides that have been banned abroad remain legal in the U.S.

- Iowa had the fourth-highest use of pesticides by weight of any U.S. state in the five-year period from 2015 - 2019 (exceeded by California, Florida, and Illinois), and Iowa has the highest prevalence of agricultural land use of any of these states with 85% of land in agriculture. Findings demonstrated that the impact of pesticide use on cancer incidence may be similar to that of smoking.
- The leading corn-producing states of the Midwest have the most increased cancer risk associated with pesticide exposure - specifically associations between pesticide use and higher incidence of leukemia, non-Hodgkin lymphoma, bladder, colon, lung, and pancreatic cancer.
- Pesticides have been detected in Iowa's surface waters, aquifers, public drinking water sources, and private wells for decades, with atrazine and metolachlor among the most frequently detected.

Additional Cancer Cases Attributed to Pesticide Use (2024)



ENVIRONMENTAL RISK FACTORS AND IOWA'S CANCER CRISIS

EXECUTIVE SUMMARY: NITRATE

Nitrate concentrations in Iowa are among the highest in the United States.

Nitrate load in Iowa's waterways has grown over time, and concentrations continue to increase. Public water treatment systems across the state struggle to keep nitrate levels below the EPA standard (10 mg/L), while many private wells exceed safe drinking water limits. Decades of landscape transformation in Iowa have accelerated the movement of nitrate into the state's waterways.

2.5x

Iowa has the most Concentrated Animal Feeding Operations of any state - approximately 2.5 times as many as the next highest state.

1%

The Des Moines and Raccoon rivers rank in the top 1% of rivers nationwide for nitrate concentration, with 80% of this contamination originating from agricultural sources.

13M

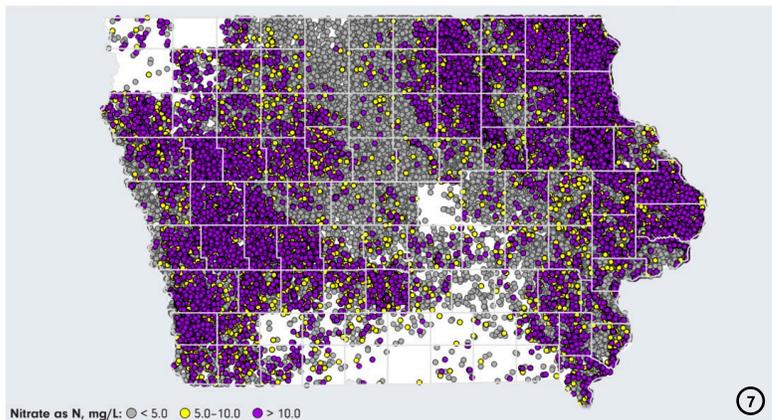
Iowa has converted our historic prairie and wetlands to row crops, installing the most subsurface tile drainage of any state, with more than 13 million farm acres drained by tile in 2022 - 47% higher than Illinois, the next-highest state.

4%

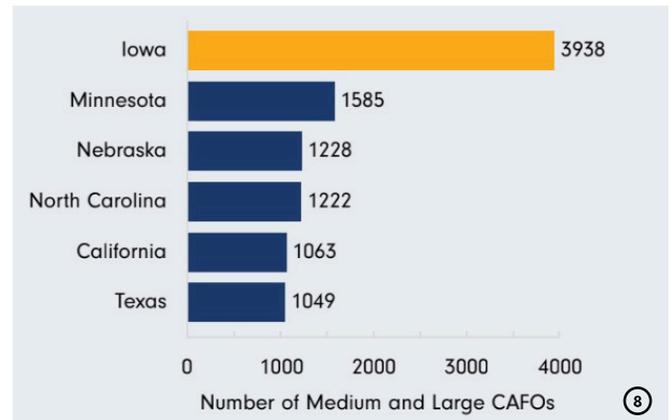
Only 4% of Iowa's community water systems have the treatment capability to remove nitrate, leaving the vast majority of systems with limited options that manage contamination rather than eliminate it.

These factors combine to create a largely unregulated waste stream that drives Iowa's high nitrate pollution and contaminates the waterways that supply the state's drinking water. A growing body of evidence shows that nitrate levels far below the EPA standard are associated with increased risks of cancer, including colorectal, ovarian, bladder, thyroid, and prostate cancer. The full "Environmental Risk Factors and Iowa's Cancer Crisis" report includes specific studies on nitrate exposure and cancer risk. One study observed a 200% increased risk of colorectal cancer among individuals consuming well water with nitrate concentrations above 2.5 mg/L. Among those with more than 10 years of exposure, the risk rose to more than 300%.

Observed Nitrate Concentrations in Iowa Private Wells (2000 - 2024)



Number of EPA-Identified Animal Feeding Operations by State (2024)



ENVIRONMENTAL RISK FACTORS AND IOWA'S CANCER CRISIS

EXECUTIVE SUMMARY: RADON

Iowa has among the highest indoor radon levels in the U.S.

The ties between radon and cancer are clear: Radon is the second-leading cause of lung cancer (after smoking) in Iowa. Lung cancer is the deadliest form of cancer among Iowans, and yet many homes have not been tested for radon.

The EPA's action level (or the point at which the agency considers radon levels to be elevated) is 4 pCi/L, and the EPA recommends that Americans remediate their homes if radon levels are between 2 and 4 pCi/L. However, there is no safe level of radon. An Iowa-based study found that 15 years of exposure to radon at 4 pCi/L was associated with a 24 - 83% increase in the odds of developing lung cancer.

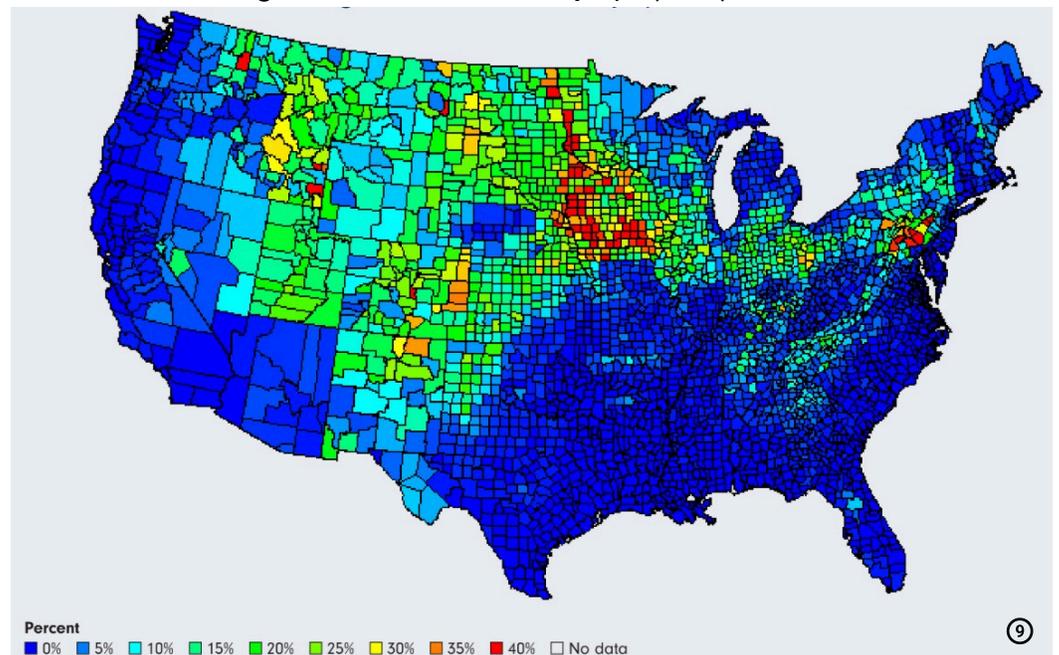
There is clear evidence of a relationship between smoking, radon exposure, and lung cancer incidence and mortality. At 4 pCi/L, the lifetime risk of radon-induced lung cancer for people who have never smoked is seven per 1,000 people, compared with 62 per 100,000 for people who have ever smoked (usually defined as those who have smoked more than 100 cigarettes in a lifetime). As radon levels increase to 10 pCi/L, the risks grow to 18 per 1,000 people who have never smoked and 150 per 1,000 for people who have ever smoked.

8 pCi/L

The statewide radon average across all counties in Iowa is 8 pCi/L. Some homes in Iowa test at

40 pCi/L
or higher.

Predicted Percentage of U.S. Homes over 4 pCi/L (2000)



Studies also show that radon is strongly associated with other types of cancer, including melanoma and skin cancers, especially among women.

Radon can also be present in drinking water, and the EPA has cited a strong association with stomach cancer as a reason to propose a rule to regulate radon in drinking water.

ENVIRONMENTAL RISK FACTORS AND IOWA'S CANCER CRISIS

EXECUTIVE SUMMARY: PFAS (FOREVER CHEMICALS)

PFAS are manufactured contaminants that break down extremely slowly and are present in water, air, food, and household products. There are more than 12,000 types of PFAS, some of which have been detected in Iowa's environment.

Strong evidence links PFAS to kidney and testicular cancers, with additional associations for prostate, ovarian, and non-Hodgkin lymphoma. Like other environmental risk factors, accumulation of PFAS from multiple sources – including occupational, community, and dietary exposures – can impact one's likelihood of developing related cancers.

The most common PFAS exposure pathway for the general public is through water ingestion, which is considered a repeated and lifelong exposure. Current monitoring may significantly underestimate public exposure to PFAS in drinking water.

Additionally, airborne exposure to PFAS is emerging as a significant concern. A recent study highlighted that PFAS can attach to PM2.5 particles, which are inhaled and pose significant health risks, particularly carcinogenic PFAS such as PFOA.

Use of PFAS in pesticides is of particular concern in Iowa given high rates of pesticide use. An estimated 30% of active pesticide ingredients approved for use over the last 10 years were PFAS.

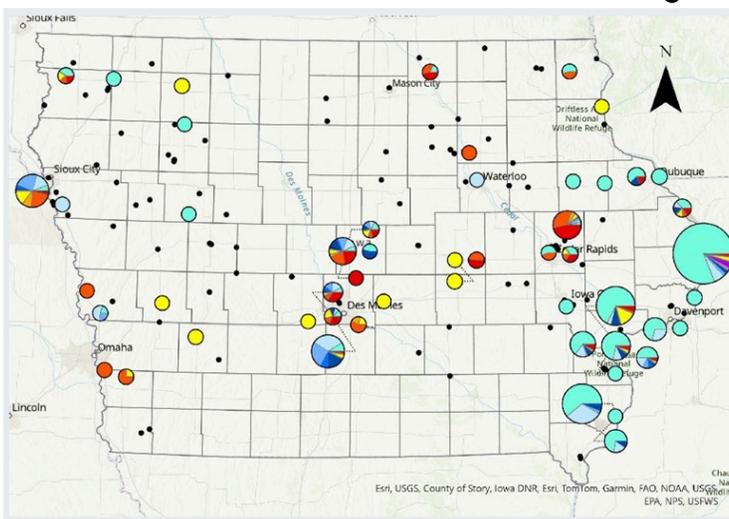
94%

PFAS have been detected in 94% of surface waters in Iowa.

30%

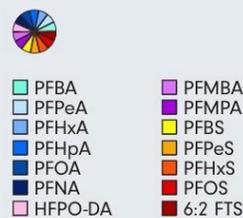
PFAS have been detected in 30% of groundwater sources in Iowa.

PFAS in Iowa Groundwater Sources Used as Drinking Water Supplies (2021-2023)



PFAS in groundwater sources of public drinking water supplies tested by the IDNR. Groundwater sources (n = 52) with PFAS detections are indicated with pie charts proportional to total PFAS concentration (size) and composition (colored wedges). Drinking water supplies with no PFAS detected (n = 117) are indicated with black dots. County lines indicated in black.

Groundwater PFAS



Total PFAS (ng/L)



• Non-detects
□ County

ENVIRONMENTAL RISK FACTORS AND IOWA'S CANCER CRISIS

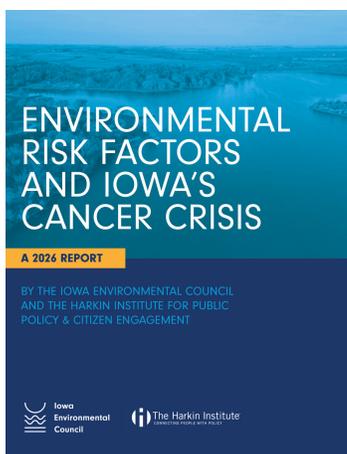
EXECUTIVE SUMMARY

Behind the statistics in this report are real people. Real Iowans – rural and urban, grandparents and grandchildren, people across political, occupational, and ideological spectrums – who have received the devastating news from their healthcare provider and have had to grapple with the health, family, and financial impacts of a cancer diagnosis.

That's why the Iowa Environmental Council and The Harkin Institute initiated the "Environmental Risk Factors and Iowa's Cancer Crisis" project. Together with the Iowa Farmers Union, we hosted 16 listening sessions across the state and heard from hundreds of Iowans, both rural and urban, living in areas with a particularly high cancer burden. In those rooms, Iowans overwhelmingly said they do not have enough information about environmental risks. They are deeply worried about exposure to agricultural chemicals, drinking water contamination, and industrial pollution. Their voices are the driving force behind this report and the movement that is building to enact real change in Iowa.

Iowa's cancer crisis is not inevitable. We can – and must – do better, especially when preventable risks are making Iowans sick and costing lives. While individual choices matter, the burden cannot rest on Iowans alone. Policymakers must lead with urgency by prioritizing prevention, advancing strong protections, and taking action to reduce the environmental contamination that distinguishes our state in ways we cannot afford to ignore.

The full version of this report includes a "Policy Recommendations and Action Steps" section with specific policies and regulatory actions that local, state, and federal leaders should take to reduce Iowans' cancer burden.



Get the full report, additional maps, citations for all information and graphics, plus other resources by scanning the code or visiting iaenvironment.org/cancerproject

Figure Sources

1. Cancer Incidence in Iowa and the United States, All Ages (1992 – 2021). Source: National Cancer Institute, 2025b.
2. Cancer Incidence in Iowa by County (2017 – 2021). Source: Iowa Cancer Registry, 2025b.
3. Estimated Agricultural Use for Glyphosate (1994 and 2019). Source: USGS, 2019. Estimated Annual Agricultural Pesticide Use.
4. Estimated Agricultural Use for Acetochlor (1994 and 2019). Source: USGS, 2019. Estimated Annual Agricultural Pesticide Use.
5. Estimated Agricultural Use for Atrazine (1994 and 2019). Source: USGS, 2019. Estimated Annual Agricultural Pesticide Use.
6. Additional Cancer Cases Attributed to Pesticide Use (2024). Source: Gerken et al., 2024.
7. Observed Nitrate Concentrations in Iowa Private Wells (2000 – 2024). Map created by Darrin Thompson, Center for Health Effects of Environmental Contamination, University of Iowa, and Daniel Gilles, IHR-Hydroscience Engineering, University of Iowa (personal communication, February 26, 2026) using data from the Iowa Well Information System (see Iowa Department of Natural Resources, n.d.).
8. Number of EPA-Identified Animal Feeding Operations (AFOs) by State (2024). Source: EPA 2024 NPDES CAFO Permitting Status Report (2025a).
9. Predicted Percentage of U.S. Homes over 4 pCi/L (2000). Source: Price et al., 2000.
10. PFAS in Iowa Groundwater Sources Used as Drinking Water Supplies. Source: Dilparic et al., 2025.