Kidney Cancer in The City of North Bay Study Summary

Background & Methodology

In April 2025, the North Bay Parry Sound District Health Unit (Health Unit) summarized data on kidney cancer using an ecological study design. The goal was to better understand the potential impact of higher levels of per- and polyfluoroalkyl substances (PFAS) in North Bay's drinking water on kidney cancer rates.

Kidney cancer was included in this analysis because scientific studies show strong evidence that PFAS exposure is linked to an increased risk of kidney cancer (National Academies of Sciences, 2022).

The ecological study design looks at groups of people, and not individuals, to see if there is a link between an exposure and a health outcome. It uses existing data, so it's quick, but it has limits.

For example:

- We can't be sure everyone counted actually drank city water. Some may have used bottled water.
- Some people may have moved to North Bay recently and had little or no exposure to city water.
- We can't say that links we see at the group level are true at the individual level.
- We can't control for other kidney cancer risk factors like smoking or high blood pressure. We tried to reduce this by comparing North Bay to similar-sized cities in Northern Ontario.

The Health Unit used data from the Ontario Cancer Registry for people living in North Bay, including those who live on areas with city-supplied water.

The age-adjusted rate of new kidney cancers per 100,000 people (with 95% confidence intervals) were compared to rates in other Northern Ontario areas and Ontario overall. This helped to see if people in North Bay had more new kidney cancer than areas assumed to have little or no PFAS in their water.

Understanding Rates

Rates help us track changes over time and account for differences in population size. Age-adjusted rates use a standard Canadian population to make control for age as a potential factor.

In Figure 1, the error bars show the 95% confidence interval—the range where we are 95% sure the true rate falls. If two error bars don't overlap, the rates are significantly different.

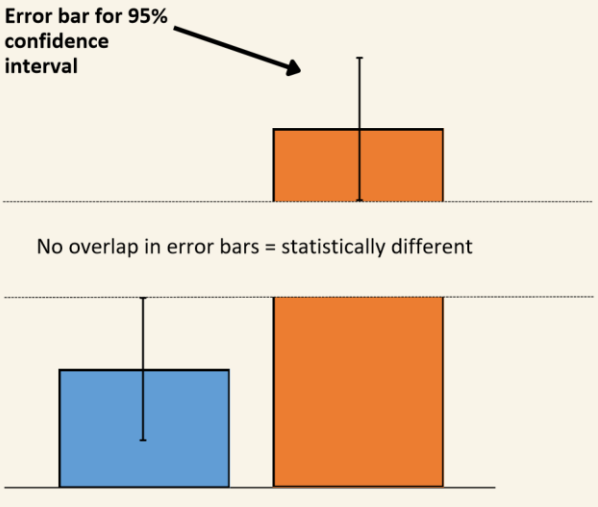

Figure 1. Example bar graph with confidence intervals.

Key Findings

For all North Bay residents, kidney cancer rates were **similar** to the two Northern Ontario comparison areas across all five-year periods between 2002 and 2021. The rate was **significantly higher** than the provincial rate for 2012–2016 (see Figure 2).

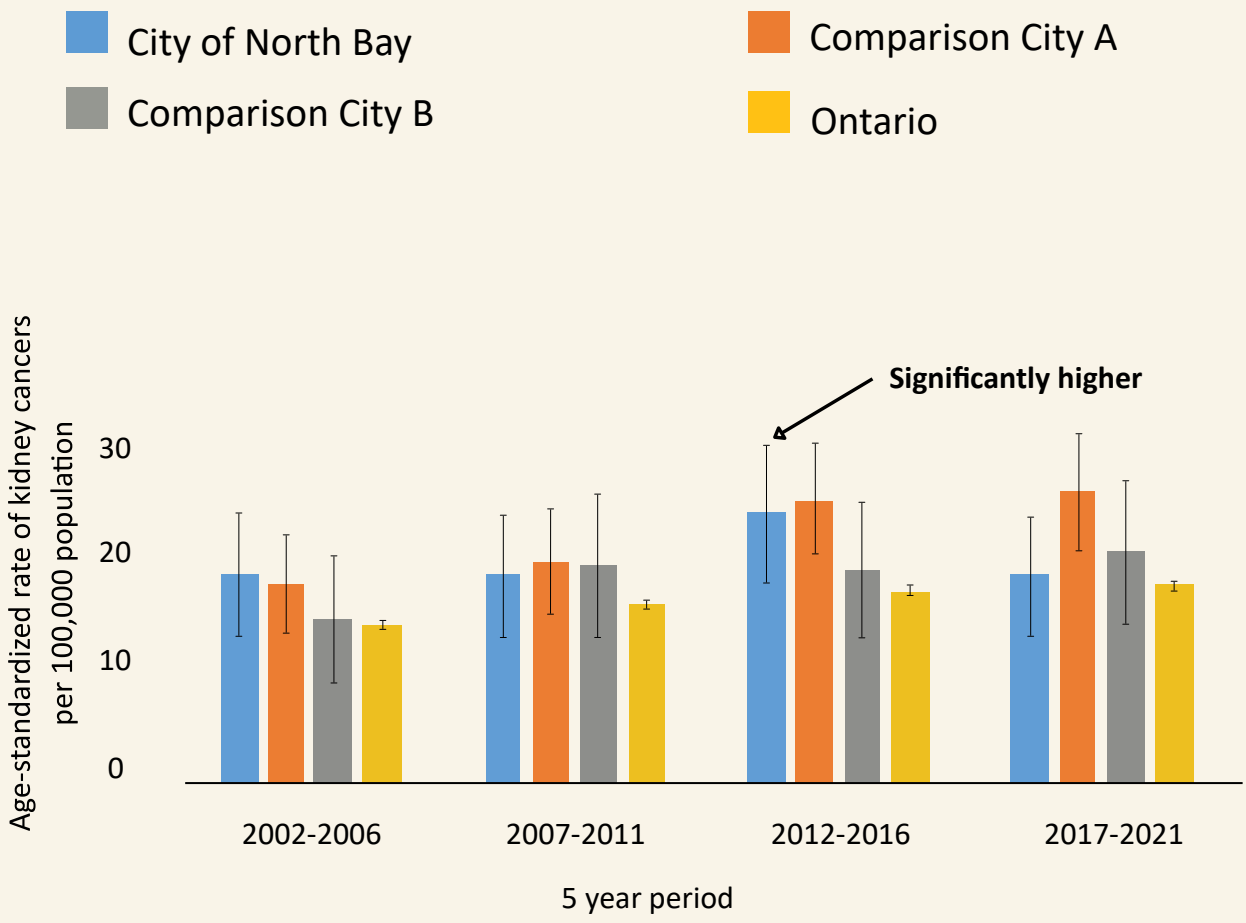

Figure 2. *Age-standardized kidney cancer incidence rate per 100,000 population, by five year time periods, for City of North Bay residents, comparison cities in Northern Ontario (A & B), and Ontario, 2002-2021.*

For North Bay residents on areas on city supplied water, rates were **similar** to Northern Ontario and Ontario overall, except in 2017–2021, when the rate was **significantly lower** than one Northern Ontario comparison area (Figure 3).

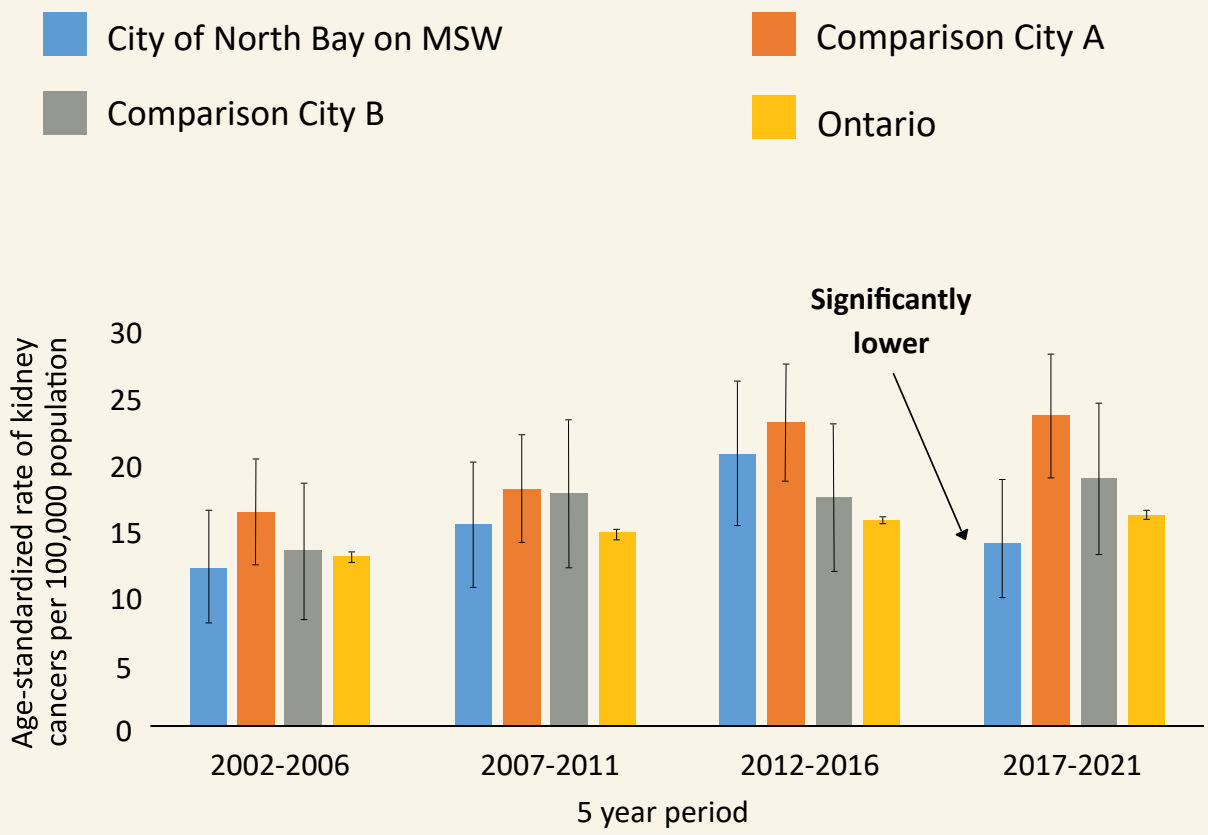

Figure 3. *Age-standardized kidney cancer incidence rate per 100,000 population, by five-year time periods, for City of North Bay residents on municipally supplied water (MSW), comparison cities in Northern Ontario (A & B), and Ontario, 2002-2021.*

What do these findings mean?

Because of the study's limits, we cannot tell for sure the impact of PFAS in North Bay's drinking water on kidney cancers for North Bay's residents.

Data Sources

Ontario Cancer Registry (October 2024), Ontario Health (Cancer Care Ontario).
Analysis by: Surveillance, Ontario Health (Cancer Care Ontario).

References

National Academies of Sciences, E. and M., Health and Medicine Division, Division on Earth and Life Studies, Board on Population Health and Public Health Practice, Board on Environmental Studies and Toxicology, & Committee on the Guidance on PFAS Testing and Health Outcomes. (2022). Guidance on PFAS Exposure, Testing, and Clinical Follow-Up. National Academies Press.

Suggested Citation

North Bay Parry Sound District Health Unit. (2026). Kidney Cancer in the City of North Bay – Study Summary. Myhealthunit.ca/PFAS.

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