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Evaluating the Impact of Alcohol Availability on Public Service Use in Northwestern Ontario

Dr. Kit Young Hoon, MOH
Northwestern Health Unit

Justin Thielman, Epidemiologist Lead
Data Science & Analytics
Public Health Ontario

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Disclosures

All authors have no conflicts of interest to declare.

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Land Acknowledgement

We acknowledge that our work takes place on the traditional territory of the Anishinaabe Nation of Treaties #3, 5 and 9, and within the Métis Homeland. We honour the Indigenous Peoples who have lived on and cared for these lands for generations. As a public health organization, we recognize that colonial histories and ongoing systemic inequities continue to shape health outcomes. Guided by the values of respect, integrity, and equity, we commit to actions that support reconciliation, Indigenous health sovereignty, and meaningful inclusion in all aspects of our work.



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Learning Objectives

By the end of this session, participants will be able to:

- Identify potential contributors to alcohol-related harms in rural communities.
- Develop strategies to evaluate natural public health experiments.
- Describe how alcohol availability may impact emergency service use.



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Research Team

Northwestern Health Unit

- Randi Casey (Health Promoter)
- Dorian Lunny (Epidemiologist)
- Dr. Kit Young Hoon (Medical Officer of Health)

Public Health Ontario

- Dr. Erin Hobin (Senior Scientist)
- Dr. Brendan Smith (Scientist)
- Dr. Sue Keller-Olaman (Manager)
- Theresa Poon (Senior Research Coordinator)
- Justin Thielman (Epidemiologist Lead)



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Alcohol-Related Harms and Evidence-Based Policy Interventions

Every year in Ontario, alcohol contributes to:

- ~4,000 deaths
- ~22,000 hospitalizations
- ~195,000 ED visits

Source: PHO/Ontario Health. *Burden of Health Conditions Attributable to Smoking and Alcohol by Public Health Unit in Ontario* (2023)

WHO identifies 3 “best buy” alcohol policies:

- Restrict physical availability
- Increase alcohol pricing/taxation
- Restrict alcohol advertising and promotion

Source: WHO. *Tackling NCDs: Best Buys for Prevention and Control of Noncommunicable Diseases*, 2024.

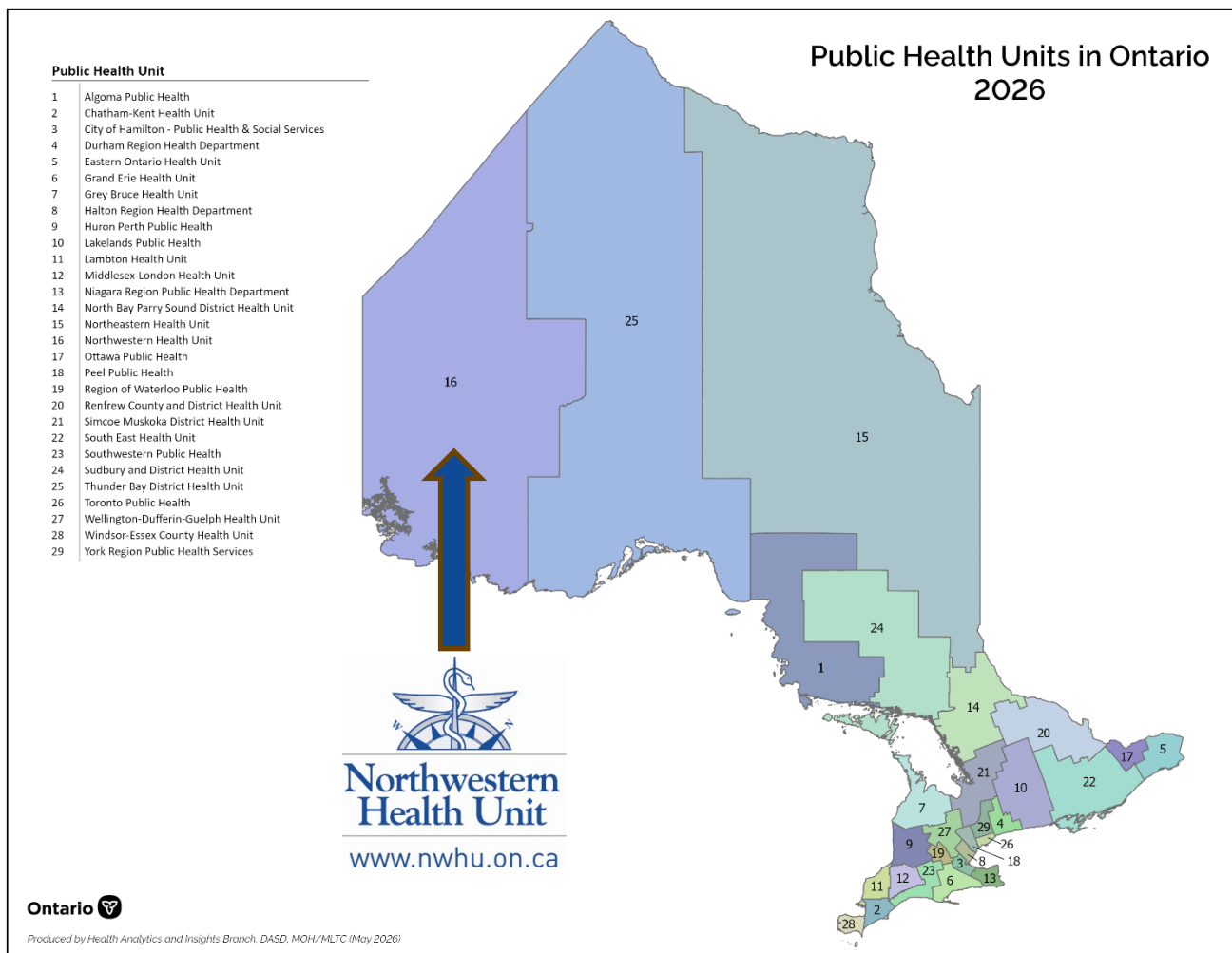
A Public Health Approach to Reducing Alcohol-Related Harms

Health Promotion	Prevention	Harm Reduction	Healthy Public Policy
Public education and awareness Building health literacy Community engagement and partnership	Youth-focused initiatives Addressing risk and protective factors Screening, brief intervention and referral	Reducing stigma and discrimination Supporting safer substance use Facilitating access to services and supports	Alcohol pricing Marketing restrictions Retail licensing and density ★ Alcohol availability



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Northwestern Health Unit

- 19 municipalities
- 39 First Nation communities
- 11 offices
- 167 FTE
- Population: 83,228
- Total land area: 173,828km²

Alcohol Harms in NWHU

NWHU's emergency visits due to alcohol were **13 times higher** than the provincial rate in 2023



7,464.3 per
100,000 - NWHU



543.7 per 100,000
- Ontario

NWHU's alcohol-related hospitalizations were **five times higher** than the provincial rate in 2023



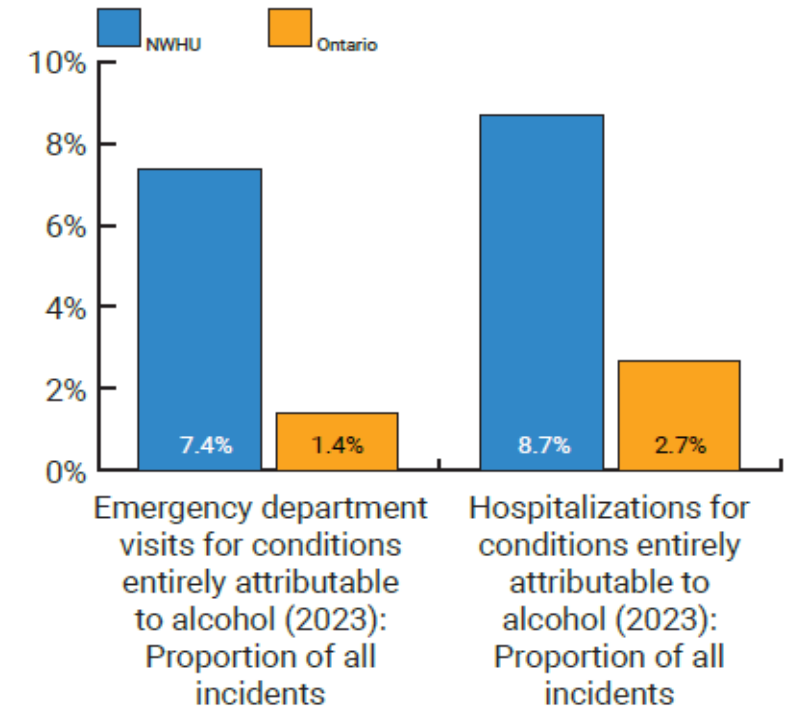
1,066.6 per
100,000 - NWHU



216.99 per 100,000
- Ontario

NWHU's proportion of health care usage attributable to alcohol is **significantly higher** than Ontario's

Proportion of health care usage



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Youth Alcohol Consumption in NWHU

27% reported drinking alcohol in the past 30 days

20% reported binge drinking in the past 30 days (consuming 5 drinks of alcohol or more on one occasion)

Among alcohol ever-users, 11% reported riding in a vehicle when the driver had been drinking alcohol, in the past 30 days

Among students that reported drinking alcohol in the past 30 days, 34% of them reported drinking alcohol when they were all by themselves

Background Information: Sioux Lookout

Very high
alcohol-related
Police Calls for
Service

New Police
Costing Formula

Police Services
Board pilot
project



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Study Objectives

- Study the effects of alcohol availability on police, emergency, and health services in NWHU catchment area
- Explore options for Municipalities looking to reduce the impact of alcohol



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NWHU Alcohol Availability Project

Two projects examined whether reduced LCBO availability aligned with reduced police and emergency service demand:

Project 1: Sioux Lookout LCBO Sunday/Monday closures (2022–2023)

Project 2: Province wide LCBO strike (July 5-22, 2024)



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Data Sources

- Emergency Department (ED) Visits
 - Accessed directly by NWHU from the National Ambulatory Care Reporting System (NACRS) via IntelliHEALTH Ontario.
- OPP calls for service
 - Obtained via contact with analyst from the North West Region Headquarters
 - Could either be requested via data request and DSA to obtain record-level data from the provincial database, or aggregate data shared directly without a formal request/DSA
 - NWHU opted to receive monthly aggregate data as it would be timely & adequate for the proposed analyses
- EMS calls for service
 - Aggregate monthly data obtained via informal request to local District contacts
 - EMS codes are standardized throughout the province
 - Data collection, collation, analysis practices can vary between Districts. Kenora District EMS was able to provide aggregate data for the alcohol-related codes of interest.

Project 1: natural experiment study groups

- Intervention community: Sioux Lookout
 - LCBO in Sioux Lookout closed Sunday-Monday, beginning 1st of May 2022
- Control community: Kenora
 - LCBO remained open 7 days/week



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Project 1a: Emergency service use on Sun-Mon vs. Tue-Sat, in Sioux Lookout and Kenora

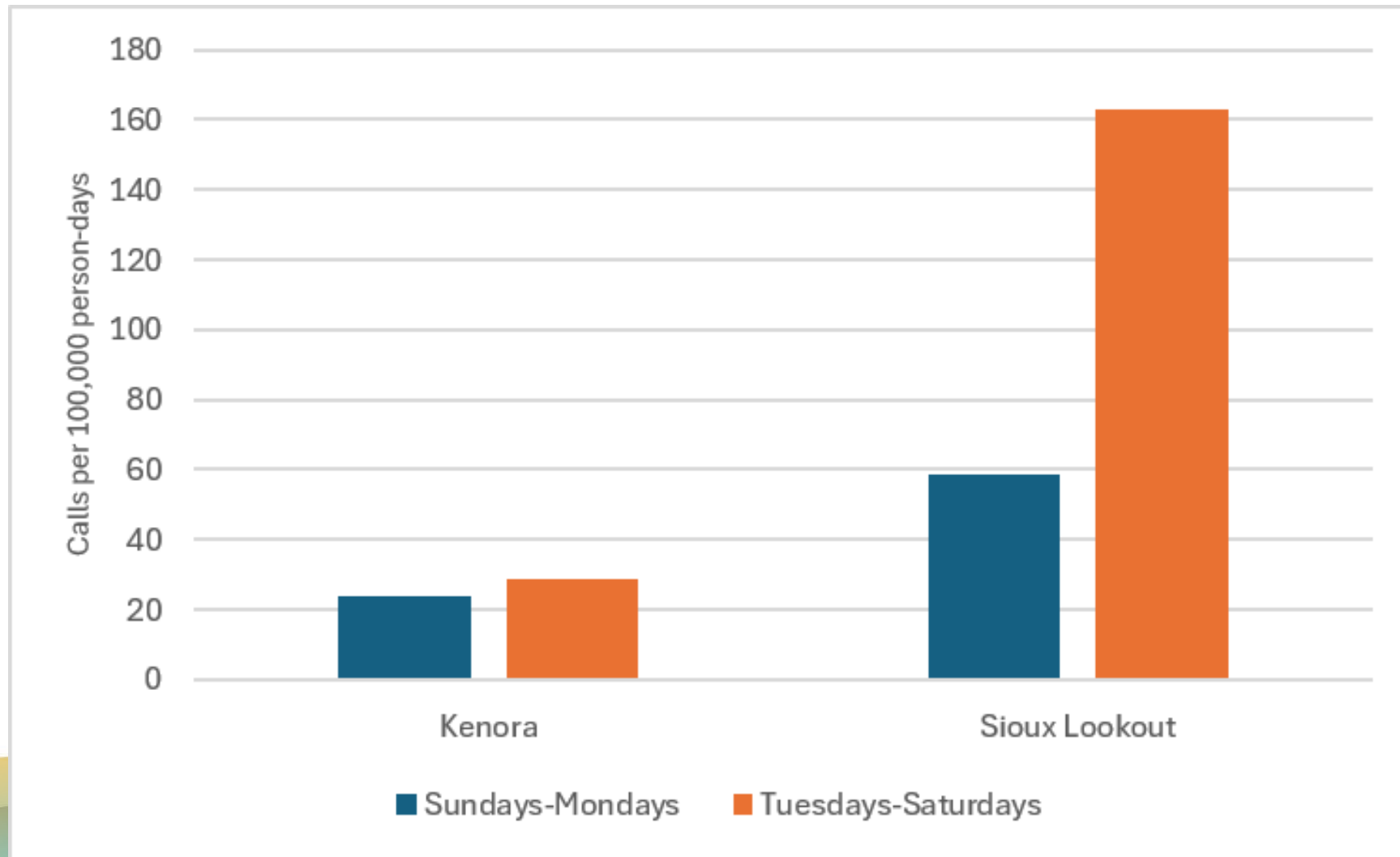
- **Difference in differences:** Difference in emergency service use on Sun-Mon compared to Tue-Sat, compared to difference in control community
 - All data from after the LCBO closure in this analysis
 - Negative binomial regression models comparing calls/visits from Sun-Mon with calls/visits from Tue-Sat
 - Offset models by log of person-days to adjust for differences in number of days from Sun-Mon vs. Tue-Sat.



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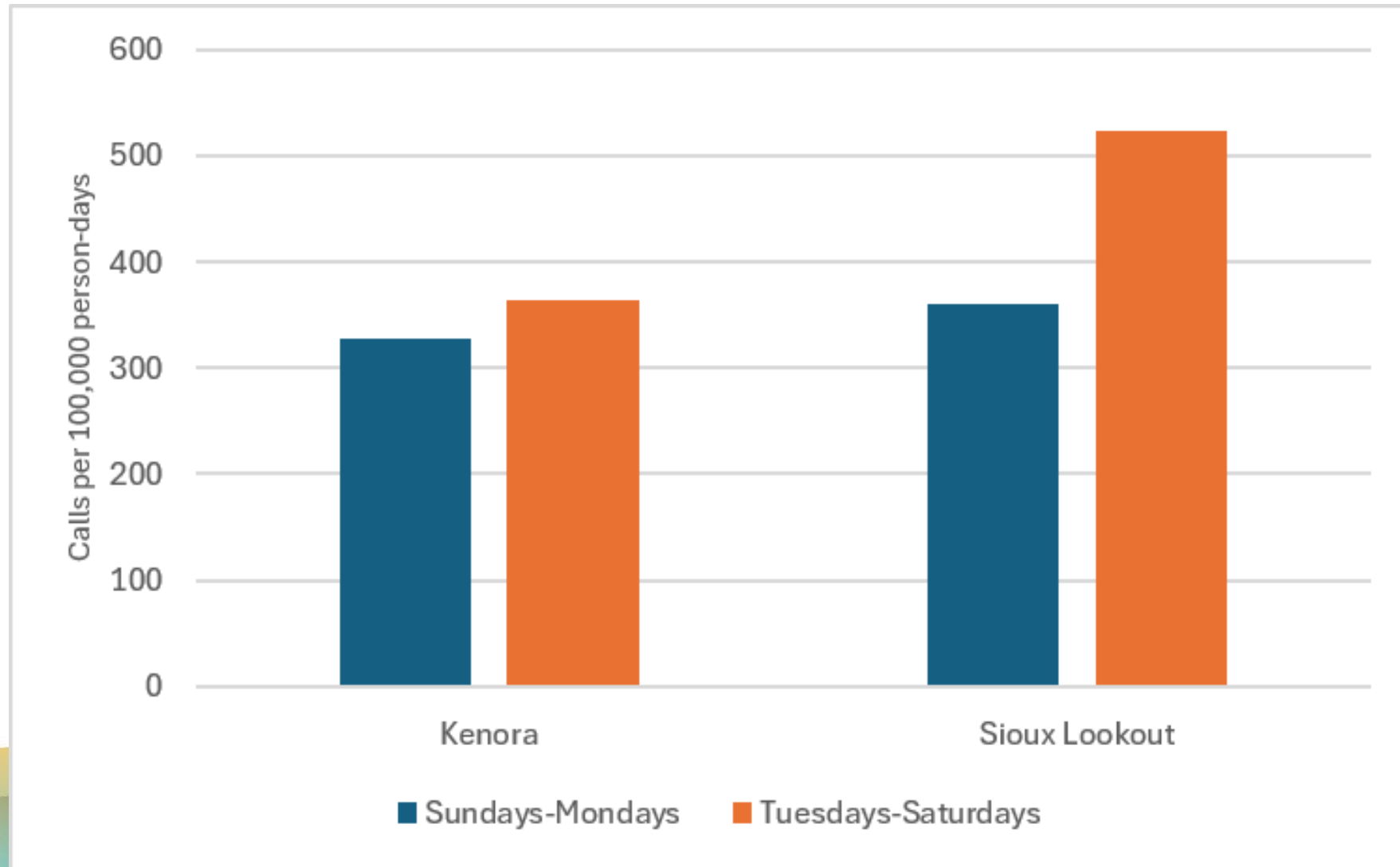
Alcohol-related OPP calls, per 100,000 person-days Sun-Mon vs Tue-Sat, 1 May 2022 to 8 March 2023



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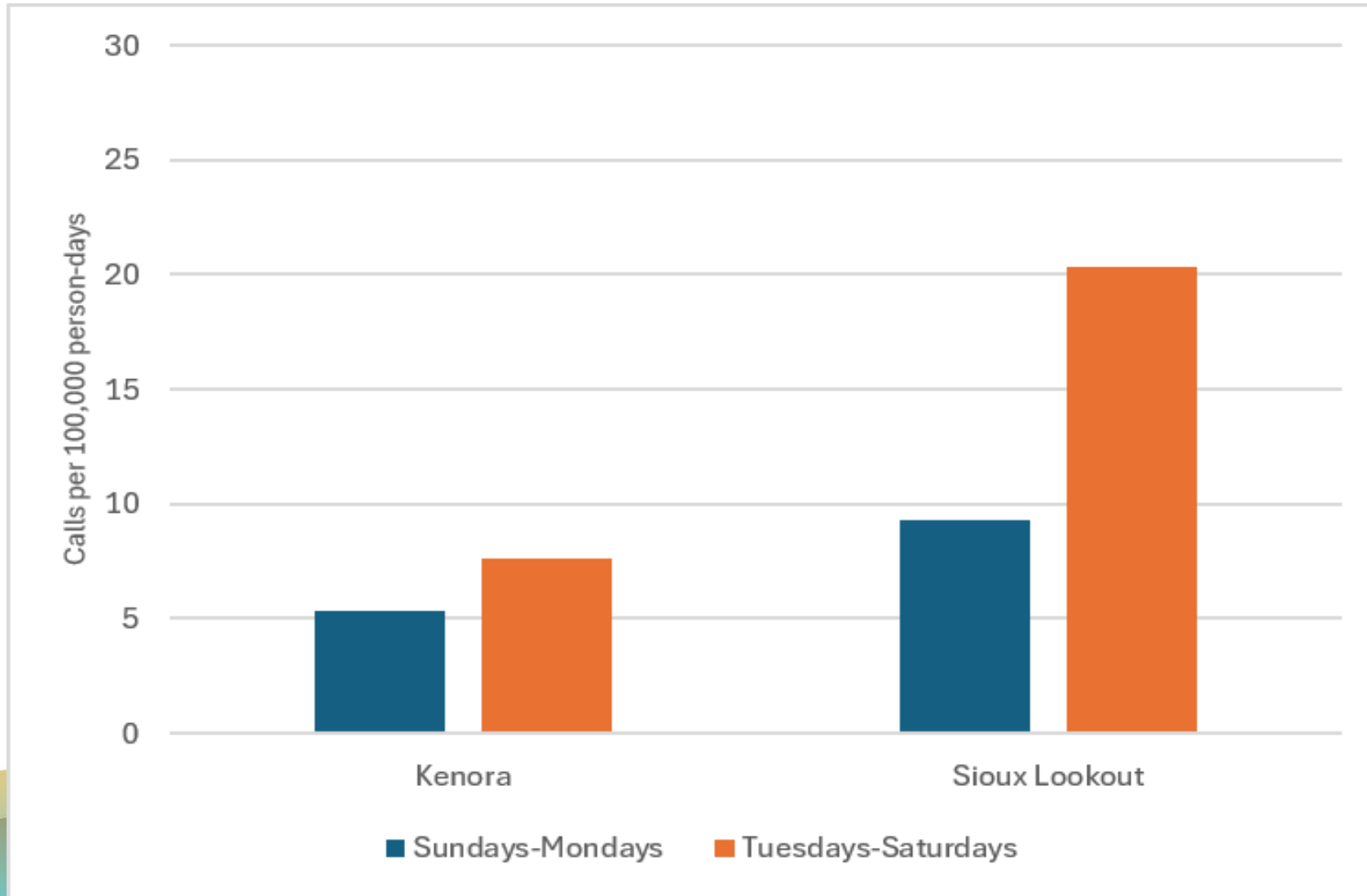
Total OPP calls, per 100,000 person-days Sun-Mon vs Tue-Sat, 1 May 2022 to 8 March 2023



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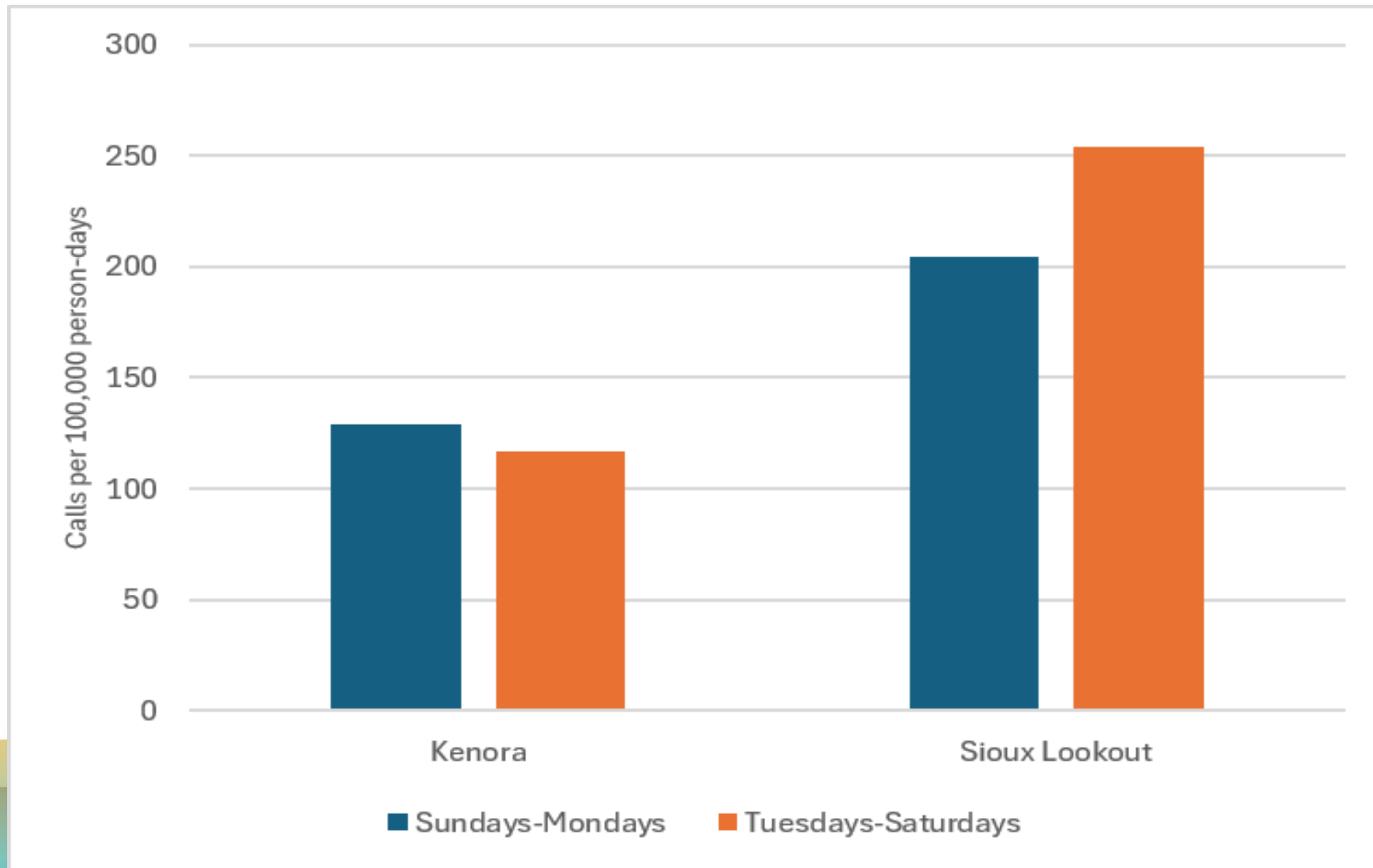
Alcohol-related EMS calls, per 100,000 person-days Sun-Mon vs Tue-Sat, 1 May 2022 to 8 March 2023



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Total EMS calls, per 100,000 person-days Sun-Mon vs Tue-Sat, 1 May 2022 to 8 March 2023



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Project 1b: trends in emergency service use over time, in Sioux Lookout and Kenora

- **Controlled interrupted time series analysis:** Model trend over time, see if trend changes after Sun-Mon LCBO closure, compare change in trend with control
 - Data from before and after Sioux Lookout's LCBO closure
 - Sun-Mon LCBO closure is the intervention or “interruption”
 - Kenora is the control group (no LCBO closure)



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Project 1b: trends in emergency service use over time, in Sioux Lookout and Kenora

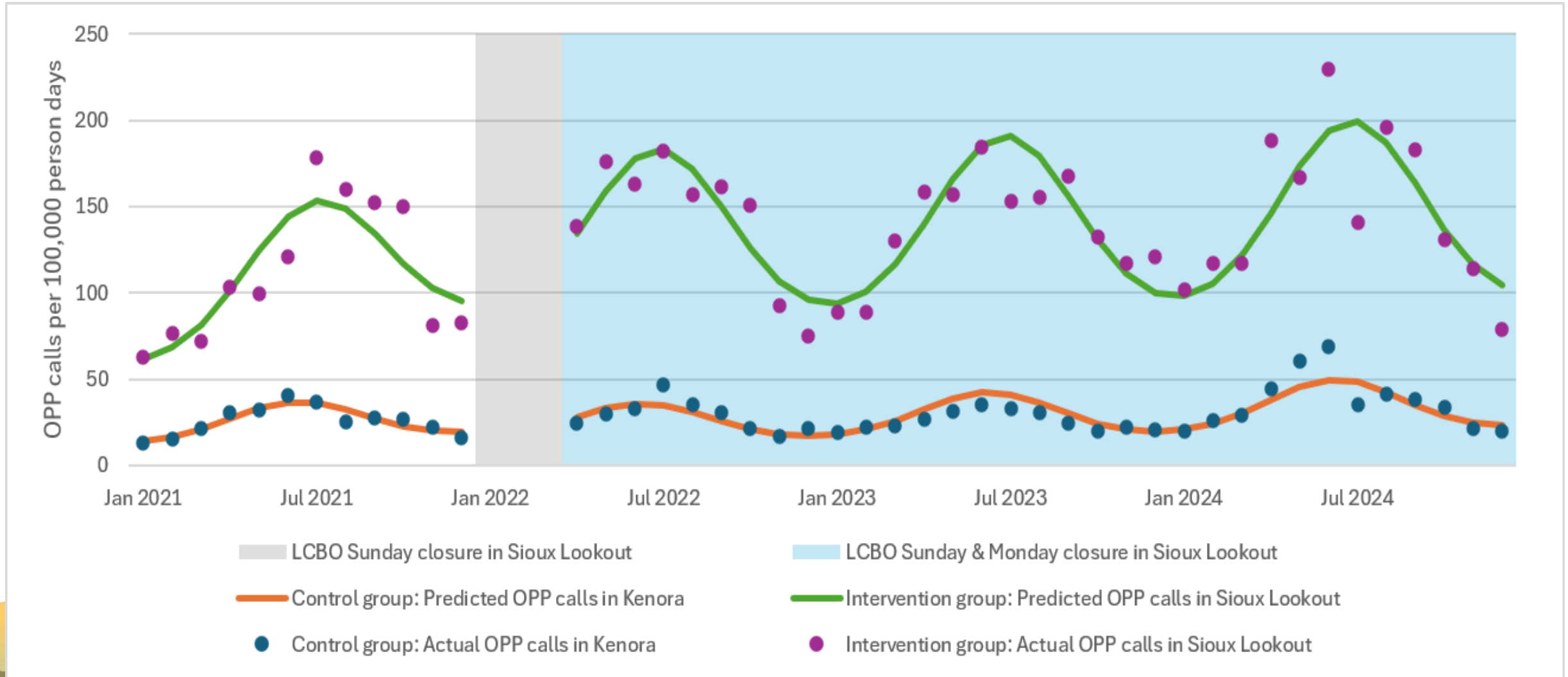
- Negative binomial regression models
 - Included time, intervention, and time*intervention in models
 - Also included time*intervention*region (3rd order interaction) to check for difference in differences
 - Controlled for seasonality with sin & cos functions
 - Offset: $\log(\text{person-days})$



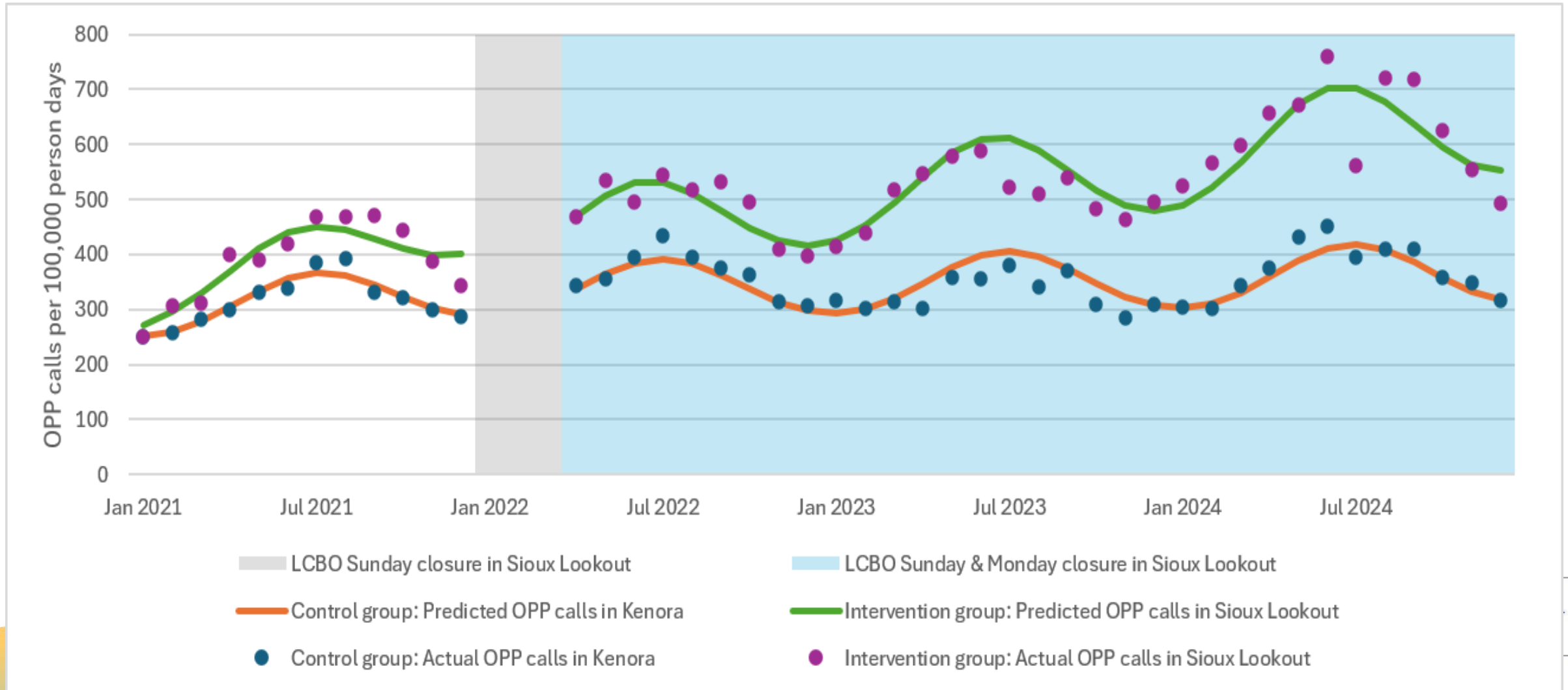
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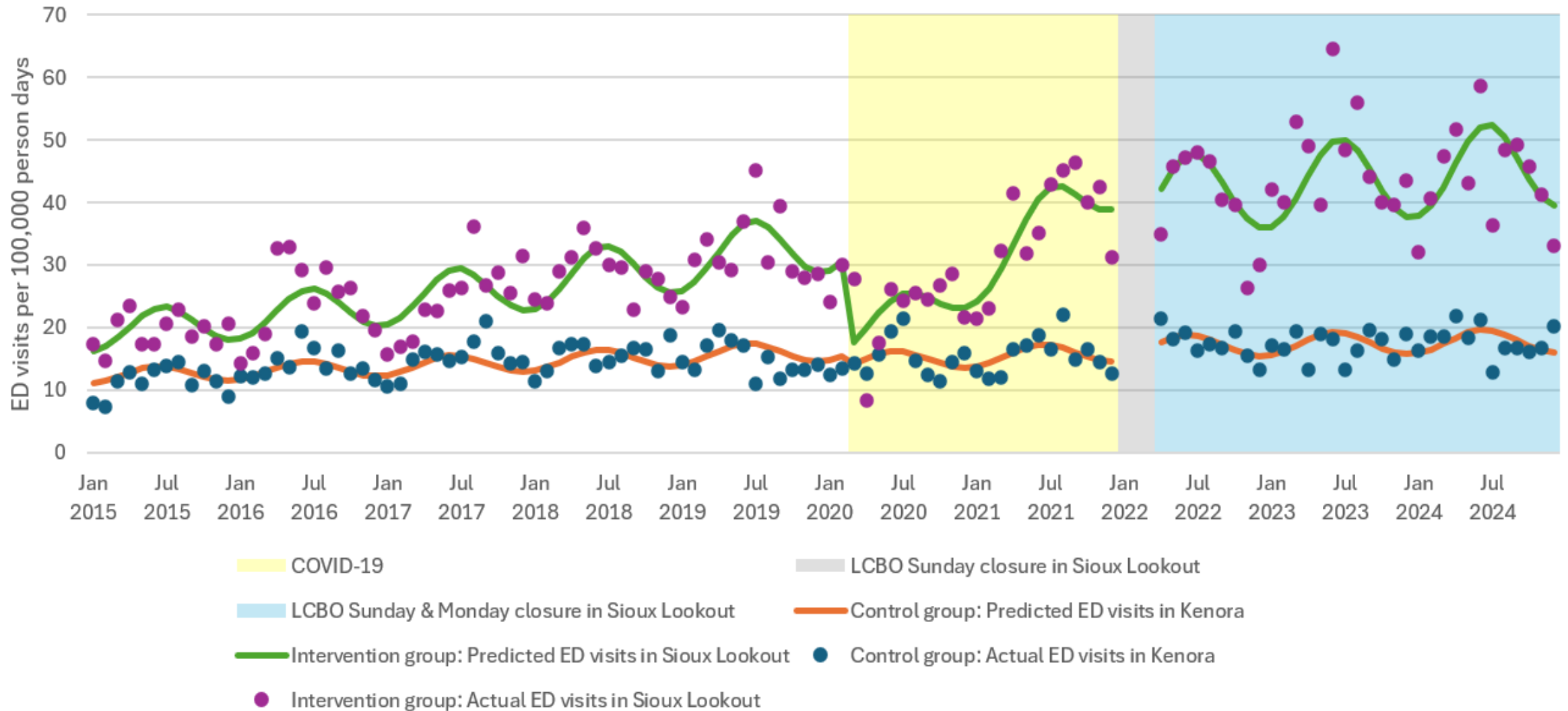
Alcohol-related OPP calls per 100,000 person-days in Kenora and Sioux Lookout, controlling for seasonality



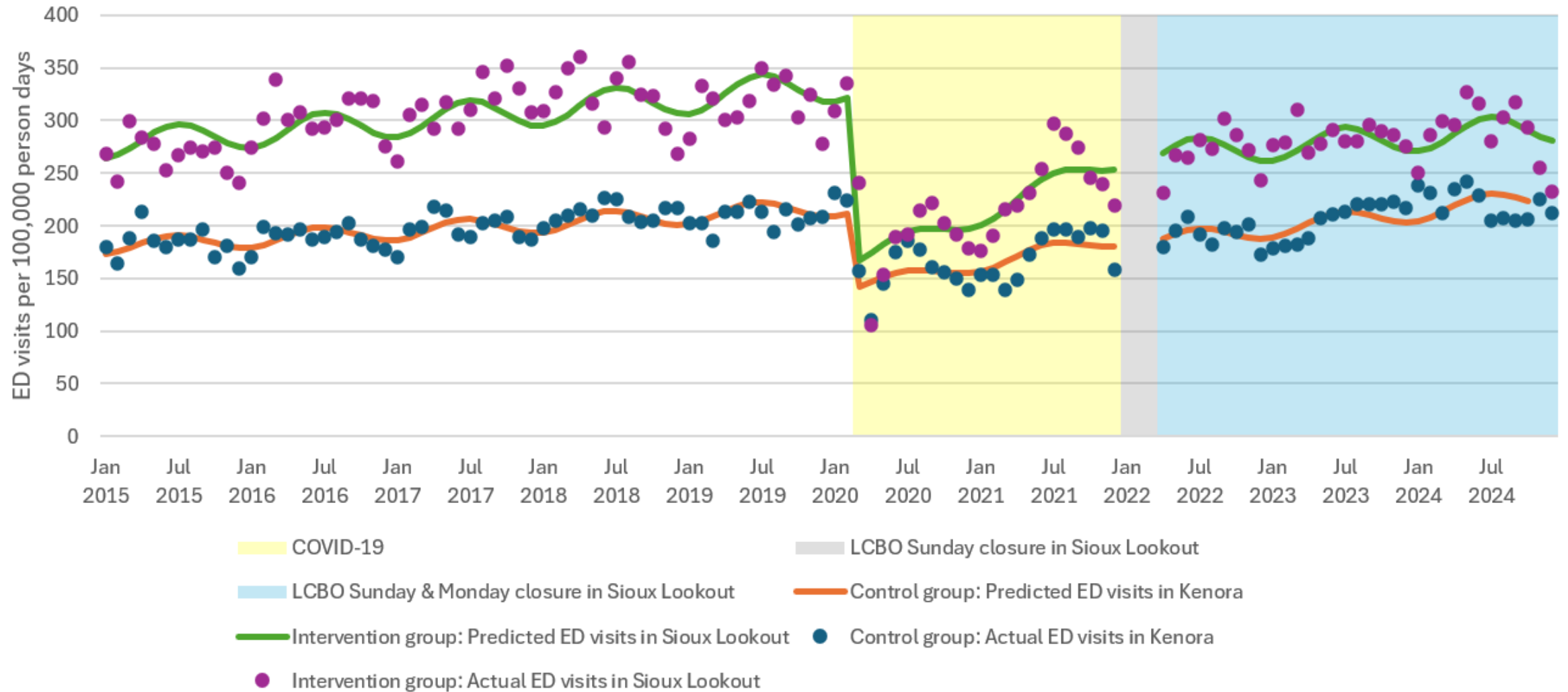
Total OPP calls per 100,000 person-days in Kenora and Sioux Lookout, controlling for seasonality



Alcohol-related ED visits per 100,000 person-days in Kenora and Sioux Lookout, controlling for seasonality



Total ED visits per 100,000 person-days in Kenora and Sioux Lookout, controlling for seasonality



Project 2: change in emergency service at time of LCBO strike, in Dryden, Kenora, Red Lake, & Sioux Lookout

- **Interrupted time series analysis:** Model emergency service use over time, see if changes occurs at time of LCBO strike
 - LCBO strike is the intervention or “interruption”
 - No regional control group: strike happened simultaneously across the province. Can only make comparisons over time
 - Combined data from communities of Dryden, Kenora, Red Lake, and Sioux Lookout



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Project 2: change in emergency service at time of LCBO strike, in Dryden, Kenora, Red Lake, & Sioux Lookout

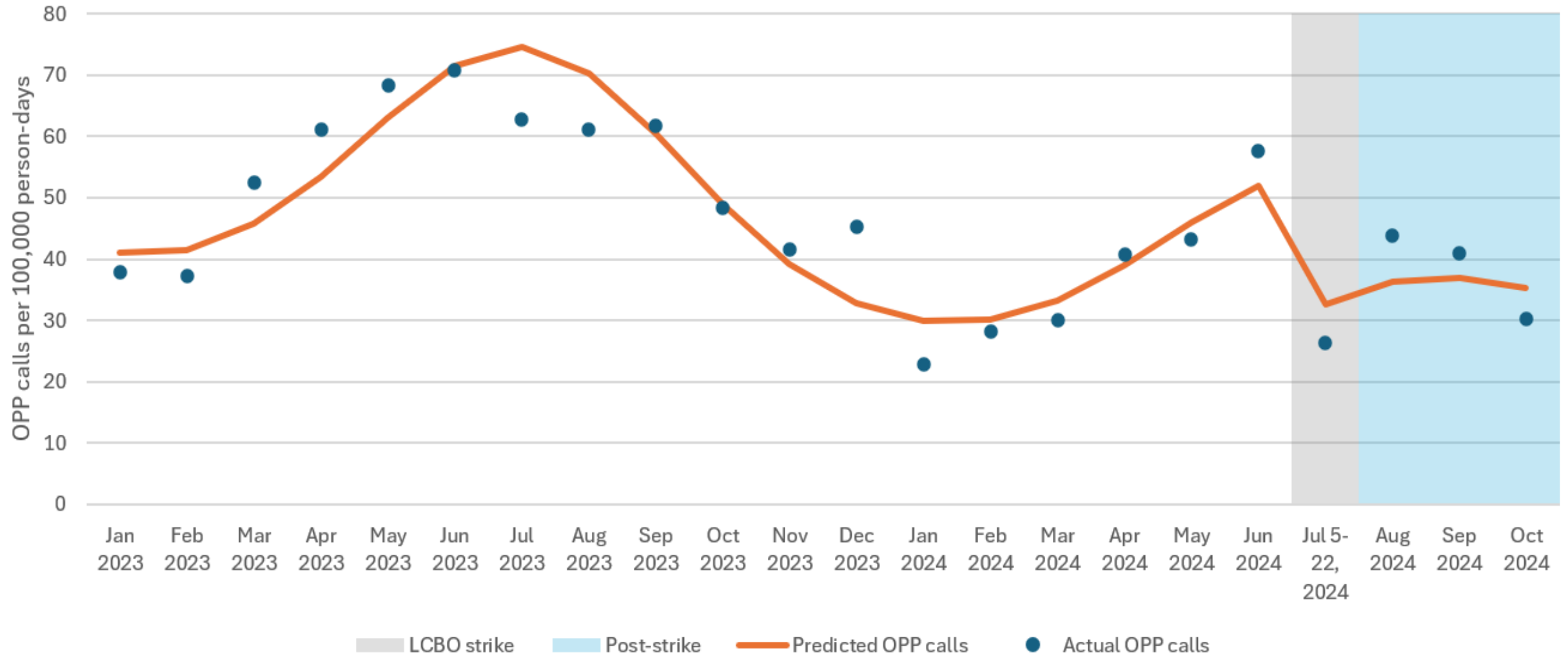
- Negative binomial regression models
 - Included time, intervention, and time*intervention in models
 - Controlled for seasonality with sin & cos functions
 - Offset: $\log(\text{person-days})$



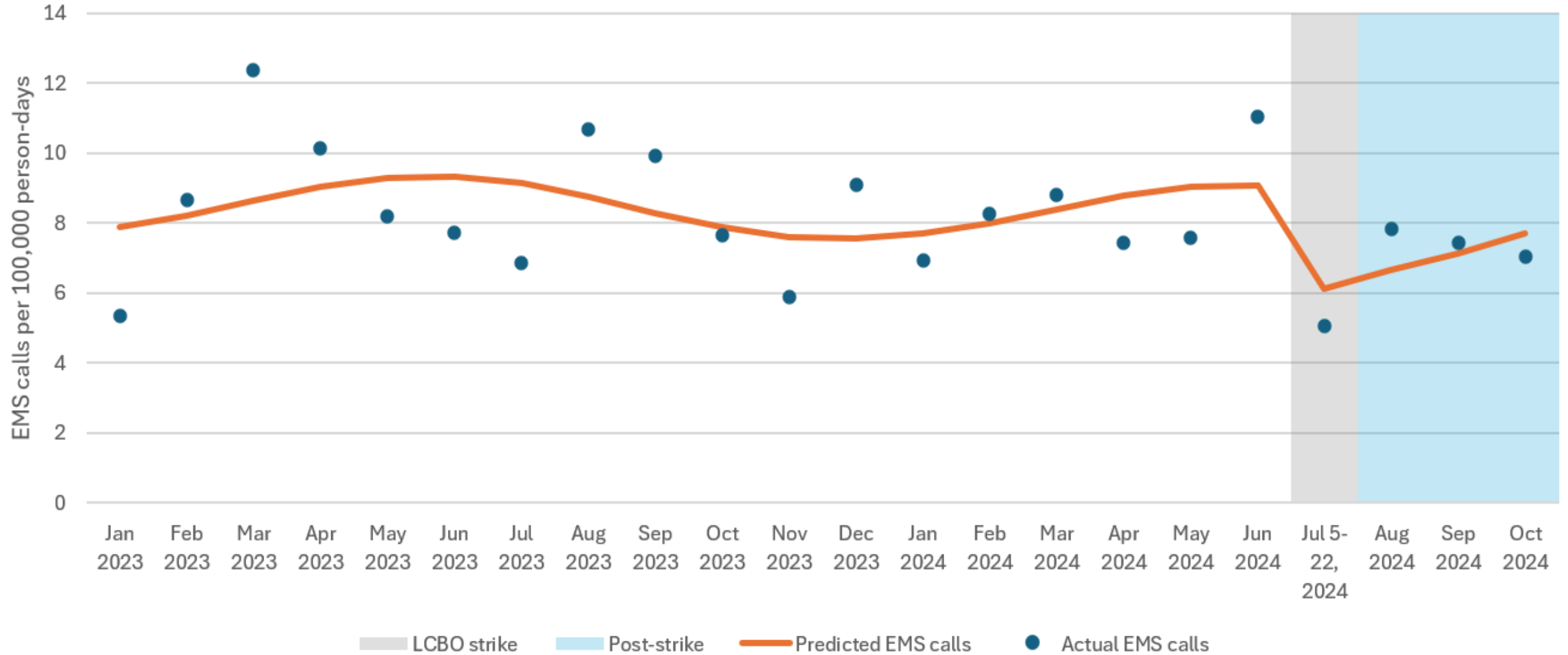
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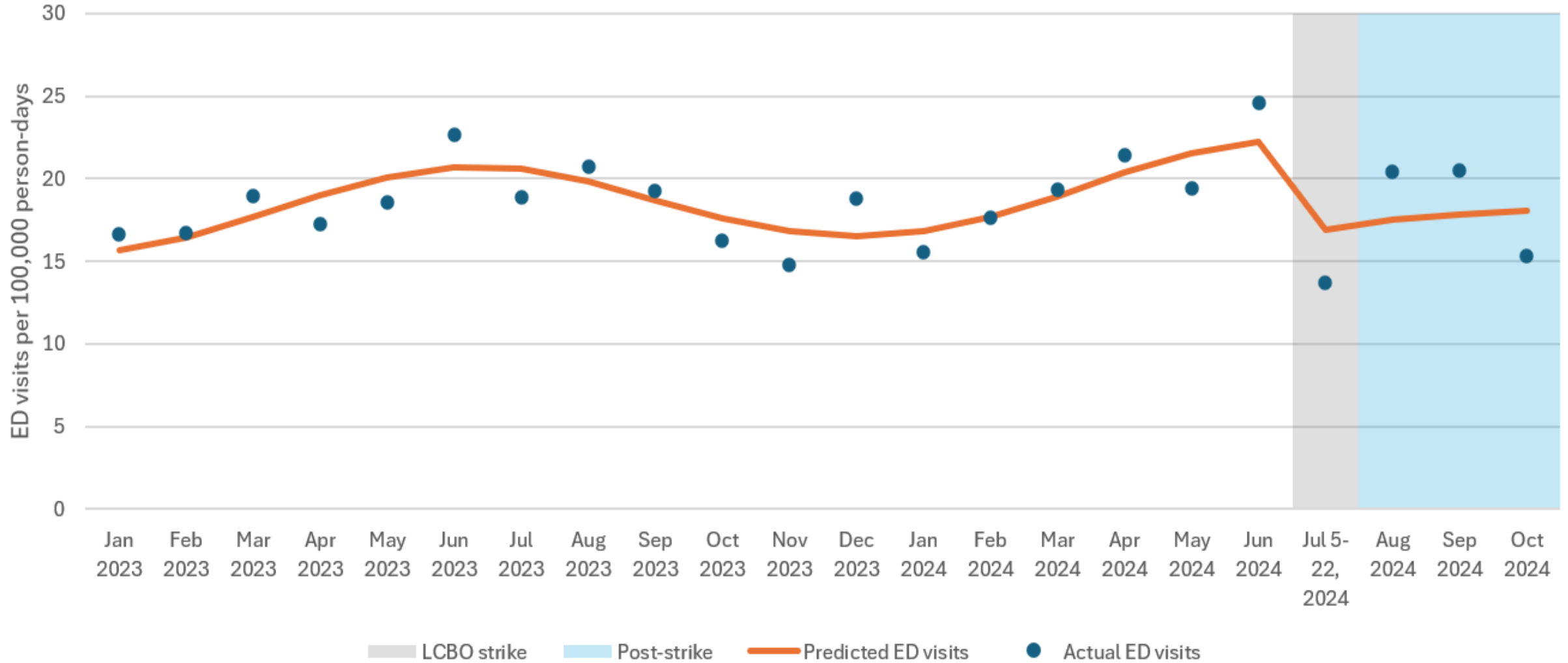
Alcohol-related OPP calls per 100,000 person-days, in Dryden, Kenora, Red Lake, & Sioux Lookout



Alcohol-related EMS calls per 100,000 person-days, in Dryden, Kenora, Red Lake, & Sioux Lookout



Alcohol-related ED visits per 100,000 person-days, in Dryden, Kenora, Red Lake, & Sioux Lookout



Interpretation and Considerations

- Effects varied across communities
- Some analyses were limited by small sample sizes
- Other alcohol outlets remained open during intervention periods
- Overall findings align with broader evidence on alcohol availability and alcohol-related harms

Local Policy Implications

- Benefits health and social service providers in engaging and supporting clients
- Supports municipalities in addressing alcohol-related harms
- May inform decisions regarding LCBO operating hours
- Local context influences how findings are interpreted and applied



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Take-Home Messages

- Alcohol-related harms place substantial strain on northern emergency systems
- Reduced alcohol availability was associated with lower police and EMS utilization
- Community context matters when addressing alcohol-related harms



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Acknowledgements

We would like to acknowledge the contributions of our partners:

- Public Health Ontario
- Municipality of Sioux Lookout
- Ontario Provincial Police – detachments: Kenora, Dryden, Red Lake, Sioux Lookout, Rainy River District.
- Kenora District Services Board
- Rainy River District Social Services Administration Board
- Sioux Lookout Meno Ya Win Health Centre



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Thank You

Collaborators at PHO

- Dr. Lennon Li (Biostatistical Specialist)
- Ashini Weerasinghe (Epidemiologist)



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Thank You

Questions & Discussion



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