

Do statutory holidays impact opioid-related hospitalizations among Canadian adults? Findings from a national case-crossover study

Chantal Houser

Department of Health Sciences, Carleton University

Co-authors: David Huynh, Amir Jasarevic, Paul Villeneuve,
Minh Do



Public Health
Agency of Canada

Agence de la santé
publique du Canada



Disclosure Statement

I have no affiliation (financial or otherwise) with a pharmaceutical, medical device or communication organization.



Background

- Deaths and harms from opioid use on the rise
 - 33% increase in deaths between 2016 and 2017
 - 42% increase in hospitalizations between 2007/08 - 2014/15
- Government of Canada → multiple strategies to combat the crisis
- Much remains to be learned about the crisis
 - Other contributors
 - Other harms from opioid use beyond overdoses



Do holidays impact opioid hospitalization?

Previous Literature

- Increase in alcohol-related hospitalization/substance use on holidays
- **Spiller et al. (2010)**
 - Modest decrease in prescription opioid misuse on holiday (decrease in number of days with increased case count)
 - No difference between family and social gathering

Knowledge Gap

- Minimal research on temporal patterns and opioid use (e.g., holidays, day of week, seasons)



Research Questions

1. Do statutory holidays impact the number of opioid related hospitalizations in Canadian adults?
1. How do these associations differ by:
 - Type of opioid-related hospitalization (mental health vs. poisoning)
 - Type of holiday (family vs. social gathering)
 - Age group and gender

CIHI Discharge Abstract Database (DAD)

- Population based administrative database of hospital discharges in Canada (except Quebec)
- The DAD contains individual-level characteristics for each hospitalization
- Discharge diagnoses are coded using the WHO's ICD-10
- **Our study population (2011-2016)**
 - Canadian adults (≥ 15 years of age)
 - ICD-10 codes
 - T40.0-T40.4 and T40.6 (poisonings)
 - F11.x (mental and behavioural conditions due to the use of opioids)

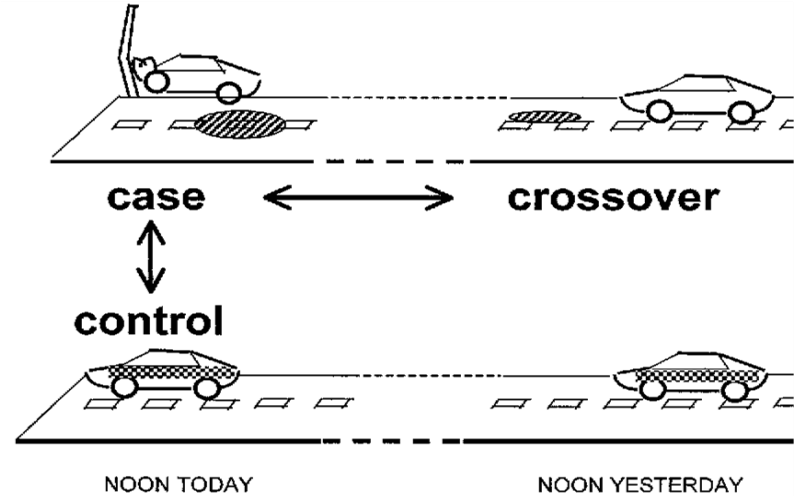


Canadian Institute
for Health Information

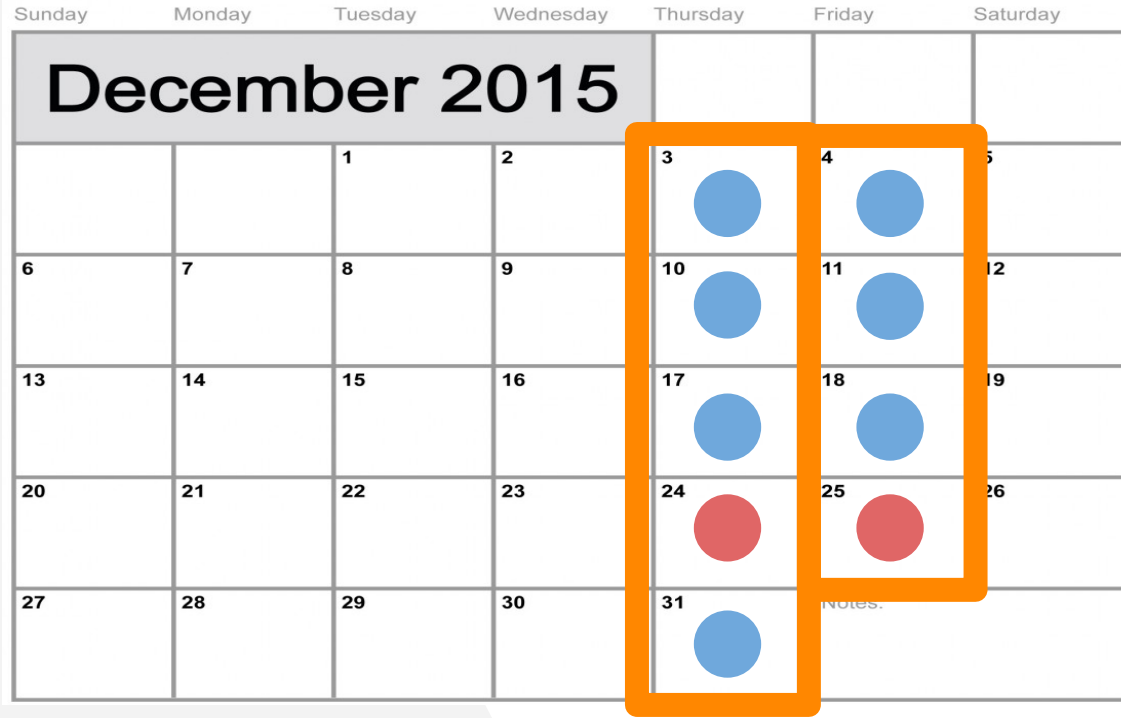
Institut canadien
d'information sur la santé

Study Design: Time-Stratified Case-Crossover

- Used to investigate transient exposures and acute health events
- **Examples**
 - Cellphone use and motor vehicle accidents
- **Advantages**
 - Minimizes confounding and bias
 - Controls for day of week effects and seasonal trends
- For our studies, holidays are our transient exposures.



Study Design: Time-Stratified Case-Crossover



Adverse opioid event



No adverse opioid event

57,256 clusters of events

- Conditional Logistic Regression
- Exposure variable coding
 - Holidays = 1
 - Non-holidays = 0

Descriptive Statistics

Total Opioid-Related Hospitalizations in Canada (excluding Quebec), 2011-2016: **57,256**

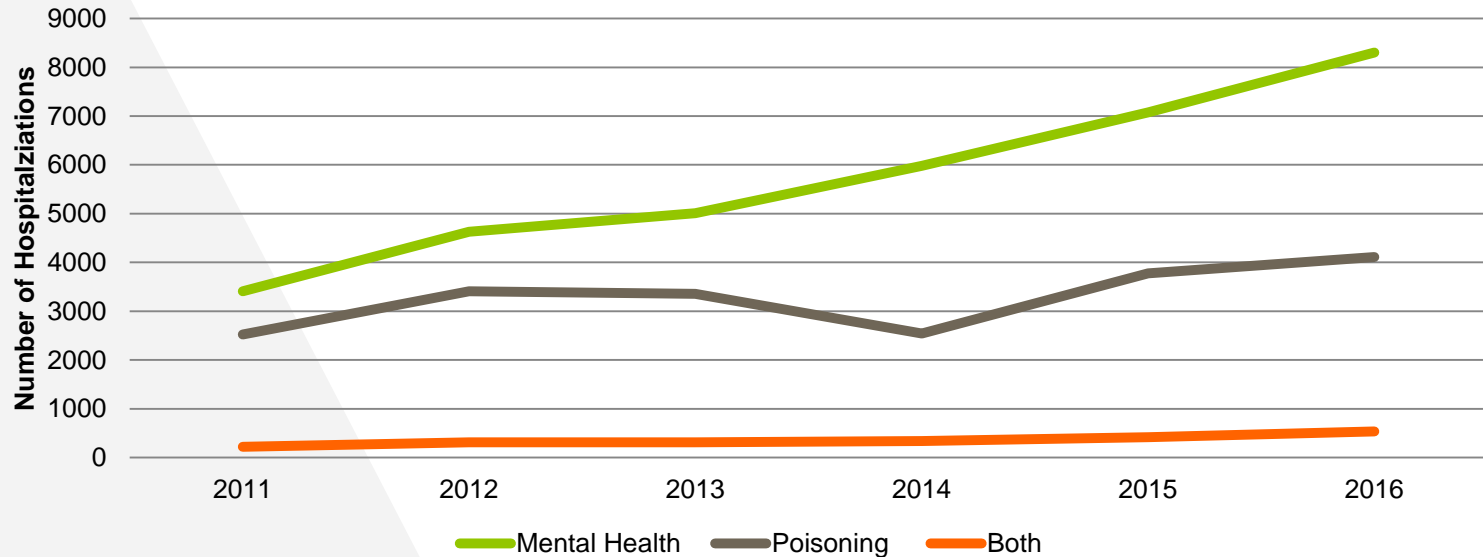
<u>Type of Hospitalization</u>	<u>n</u>	<u>%</u>	<u>Sex</u>	<u>n</u>	<u>%</u>
Mental Health (F11.x)	34,409	60.1	Female	27,783	48.5
Poisonings (T40.0-T40.4, T40.6)	20,709	36.2	Male	29,444	51.4
Both	2,138	3.7	Other	29	0.1

<u>Day of Week</u>	<u>n</u>	<u>%</u>	<u>Age Group</u>	<u>n</u>	<u>%</u>
Sunday	7,429	13.0	15-24	6,615	11.6
Monday	8,471	14.8	25-64	42,160	73.6
Tuesday	8,414	14.7	65+	8,481	14.8
Wednesday	8,380	14.6			
Thursday	8,597	15.0			
Friday	8,559	15.0			
Saturday	7,406	12.9			

<u>Region Type</u>	<u>n</u>	<u>%</u>
Rural	9,333	16.3
Urban	47,923	83.7

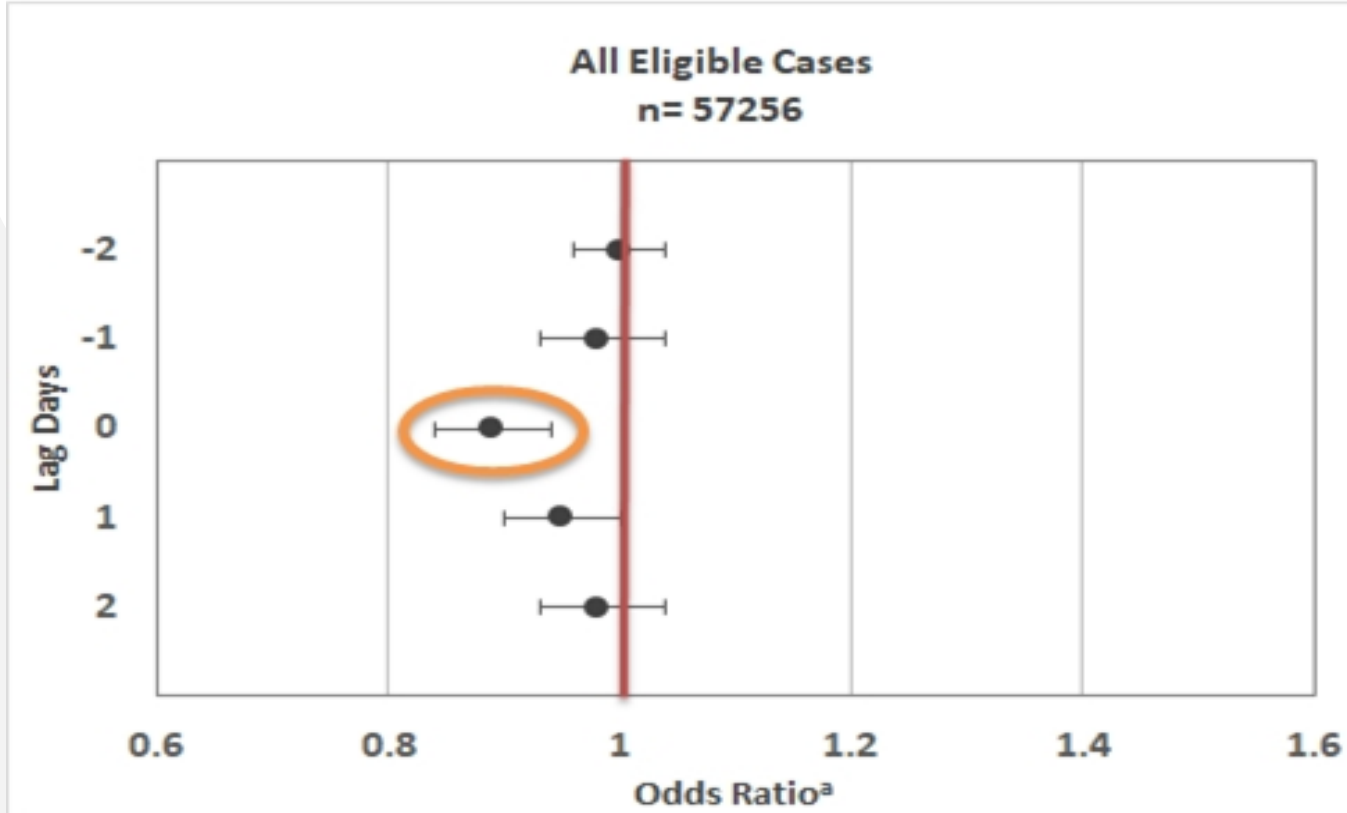
Trends between 2011 and 2016

Opioid-Related Hospitalizations, Canada (excluding Quebec, ≥ 15 years of age) 2011-2016



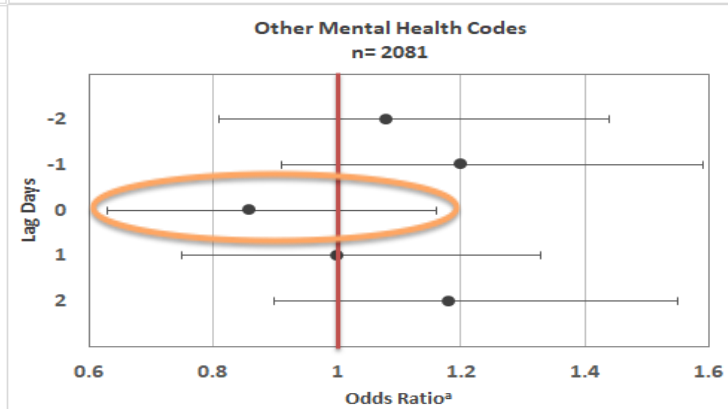
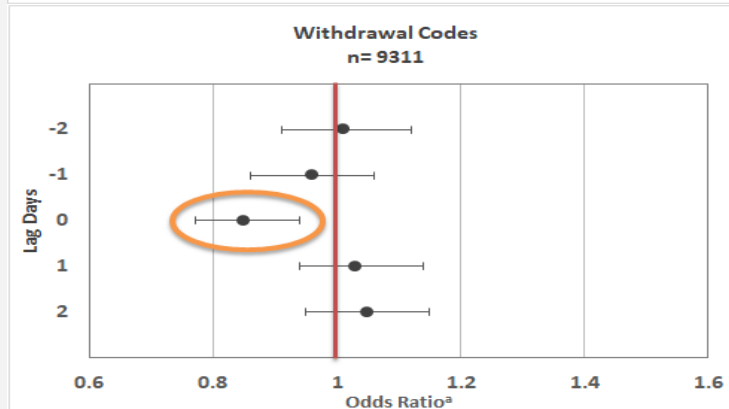
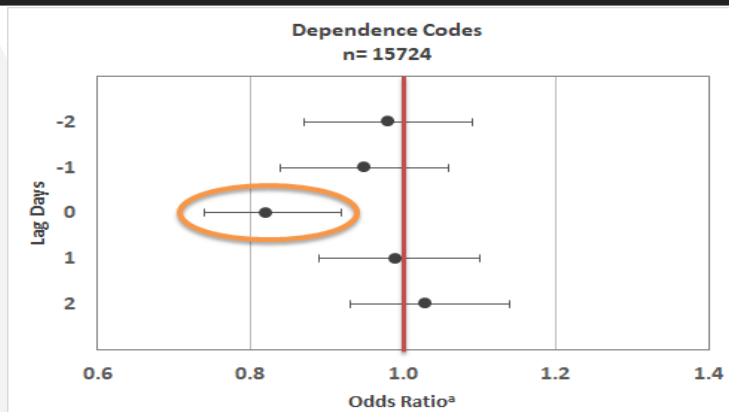
Results: All Opioid Related Cases

Holidays were associated with an
11% (95% CI: 6% to 16%)
reduction in hospitalizations



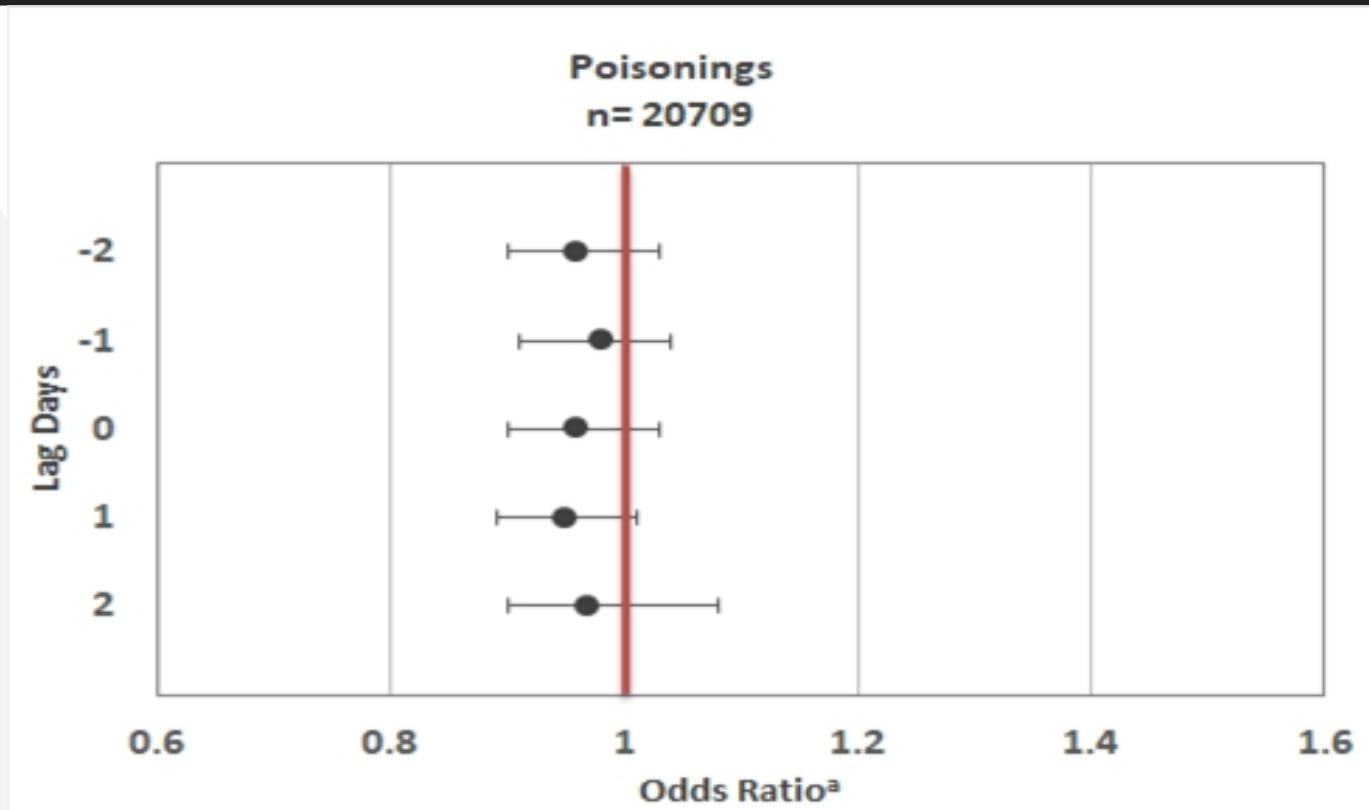
Results: Mental Health Cases

Holidays were associated with a **16 - 18%** reduction



Results: Poisoning Cases

Beneficial associations with holidays were not nearly as strong for **poisonings**



Results: Holiday Type

Social Gathering Holiday

All Opioid Cases

10%



Mental Health
Opioid Cases

11-13%



VS

Family Holidays

All Opioid Cases

14%



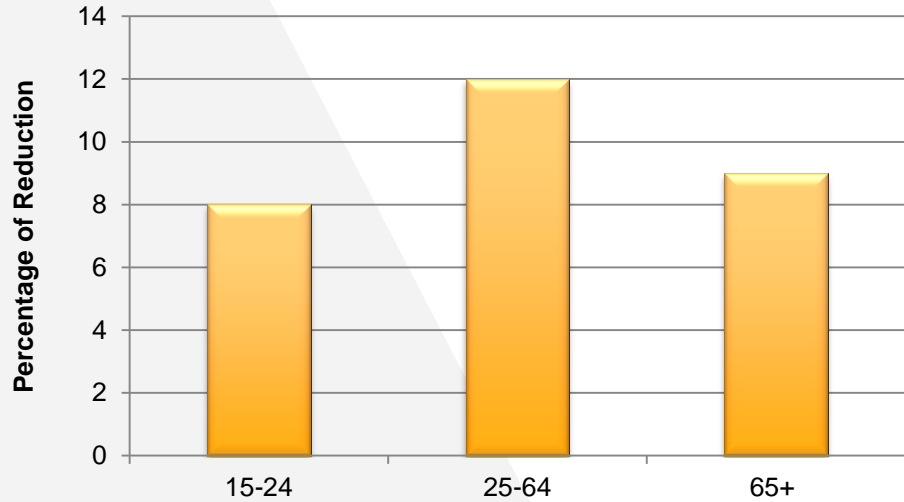
Mental Health
Opioid Cases

21-25%

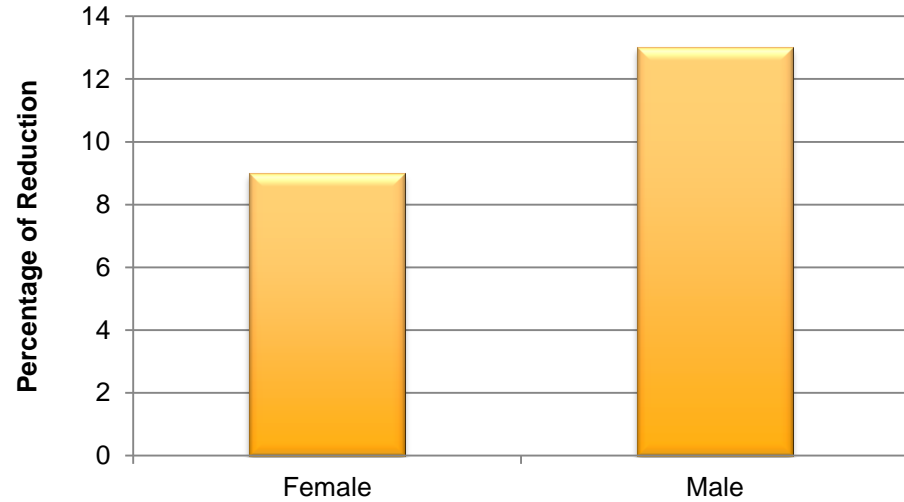


Results: Sex and Age

Age Group



Sex



Strength and Limitations

Strengths

- Large sample size
- Population based nature
- Completeness of data

Limitations

- Excludes Quebec
- Possible bias of staffing
- Only hospitalizations, not all cases



Conclusion and Recommendations

- Holidays are associated with reduced opioid-related hospitalizations
- Our findings may provide insight for:
 - Timing of health promotion efforts
 - Encouraging social support and treatment
 - Identifying areas of priority (e.g., public health strategies, hospital staffing resources)
- Recommendations for future research
 - Emergency department and EMS data
 - Explore patterns of adverse opioid events
 - Inclusion of mental health

Email: ChantalHouser@cmail.carleton.ca

Thank you!

Questions?

Acknowledgements:

David Huynh and Amir Jasarevic
(Carleton University)

Dr. Paul Villeneuve
(Carleton University)

Dr. Minh Do
(Carleton University/HC)

Wendy Thompson (PHAC)



Public Health
Agency of Canada

Agence de la santé
publique du Canada