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# **A Step Towards Understanding the Full Burden of Drowning: Ontario's Non-fatal Drowning Report**

**Tuesday September 14, 2021**



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# Webinar agenda

- What is non-fatal drowning?
- The Ontario Non-fatal Drowning Report
- Non-fatal drowning trends, 2010-2019
- Next steps for non-fatal drowning research
- Questions



# What is non-fatal drowning?

- Drowning is the process of experiencing respiratory impairment from submersion or immersion in liquid
  - Drowning outcomes are fatal or non-fatal
  - In non-fatal drowning, the process of respiratory impairment is stopped before death





# Impacts of non-fatal drowning



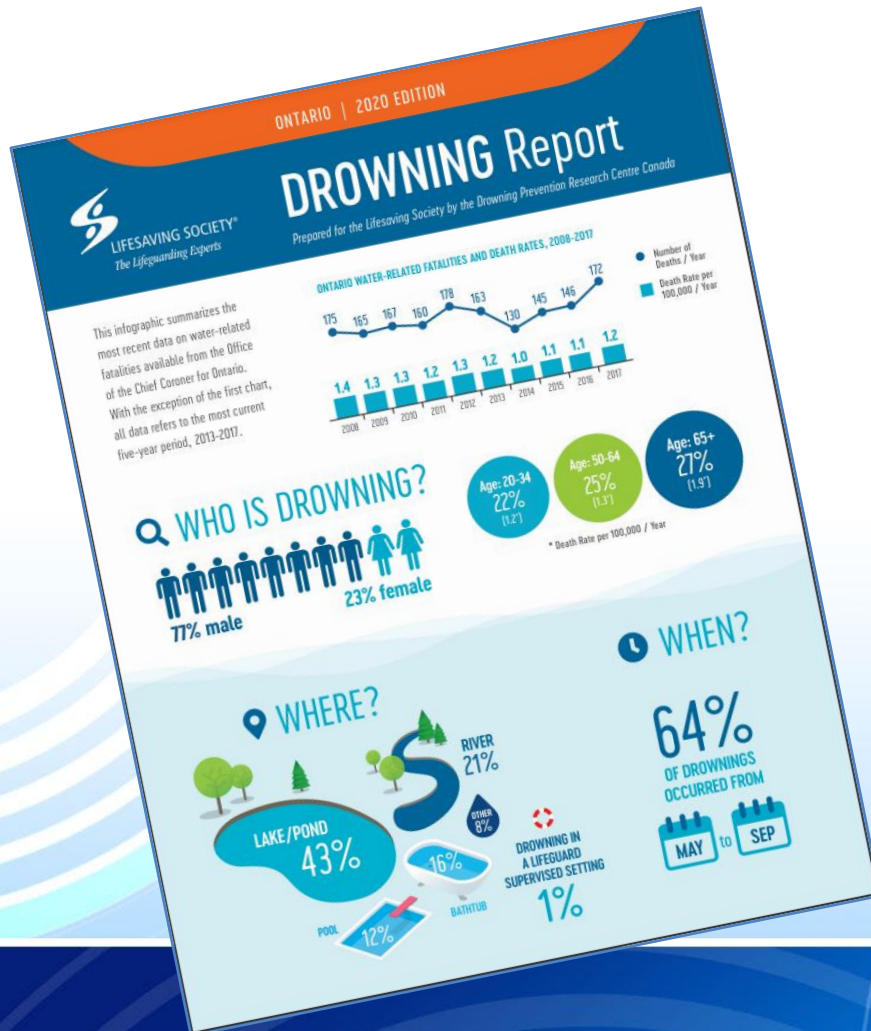
- Non-fatal drowning can result in serious long-term consequences for individuals and families
- Economic impacts
  - Drowning injuries had the highest cost per ED visit<sup>1</sup>

1. <https://parachute.ca/en/professional-resource/cost-of-injury-in-canada/>

# The injury pyramid



# Drowning reports





# The Ontario non-fatal drowning report



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## Ontario Non-Fatal Drowning Report, 2021

Prepared for the Lifesaving Society Ontario by the Drowning Prevention Research Centre Canada

Drowning research and prevention activities have typically focused on fatal drowning; however, there are many more non-fatal drowning incidents than drowning deaths each year. For every fatal drowning in Ontario, there are nearly **four non-fatal drownings** that are serious enough to require an emergency department visit.

*Drowning is the process of experiencing respiratory impairment from submersion/immersion in liquid.*

*Drowning can be fatal or non-fatal. In non-fatal drowning, the respiratory impairment is stopped before death. Non-fatal drowning can result in a range of outcomes, from no injuries to serious injuries or permanent disability.*

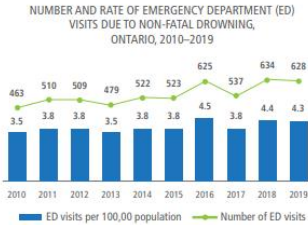
<b>152</b>	<b>95</b>	<b>543</b>
Average number of fatal drowning deaths each year*	Average hospitalizations due to non-fatal drowning each year	Average emergency department visits due to non-fatal drowning each year

This report is a first step towards describing the true burden of drowning in Ontario by focusing on non-fatal drowning. The data were made available by Public Health Ontario, based on the Canadian Institute for Health Information (CIHI) National Ambulatory Care Reporting System (NACRS).<sup>1,2</sup>

The full burden of non-fatal drowning is unknown. This report does not include non-fatal drowning incidents where the person was treated at the scene of the drowning and did not seek further medical attention, those who attended a family physician or clinic, and those who did not receive any treatment at all. If data from these sources were available, the number of non-fatal drownings included in this report would be even higher.

### Emergency department visits and hospitalizations due to non-fatal drowning

During 2010–2019, there were 5,430 emergency department visits due to non-fatal drowning, an average of 543 per year. The rate<sup>1</sup> of visits increased 23% during the 10-year period from 3.5 per 100,000 in 2010 to 4.3 per 100,000 in 2019.



\*Average number of water-related fatalities per year where drowning was a primary or contributory cause of death in Ontario, during the most recent 10 years for which data were available, 2008–2017.

<sup>1</sup> All rates in this report are crude annual rates per 100,000 population.



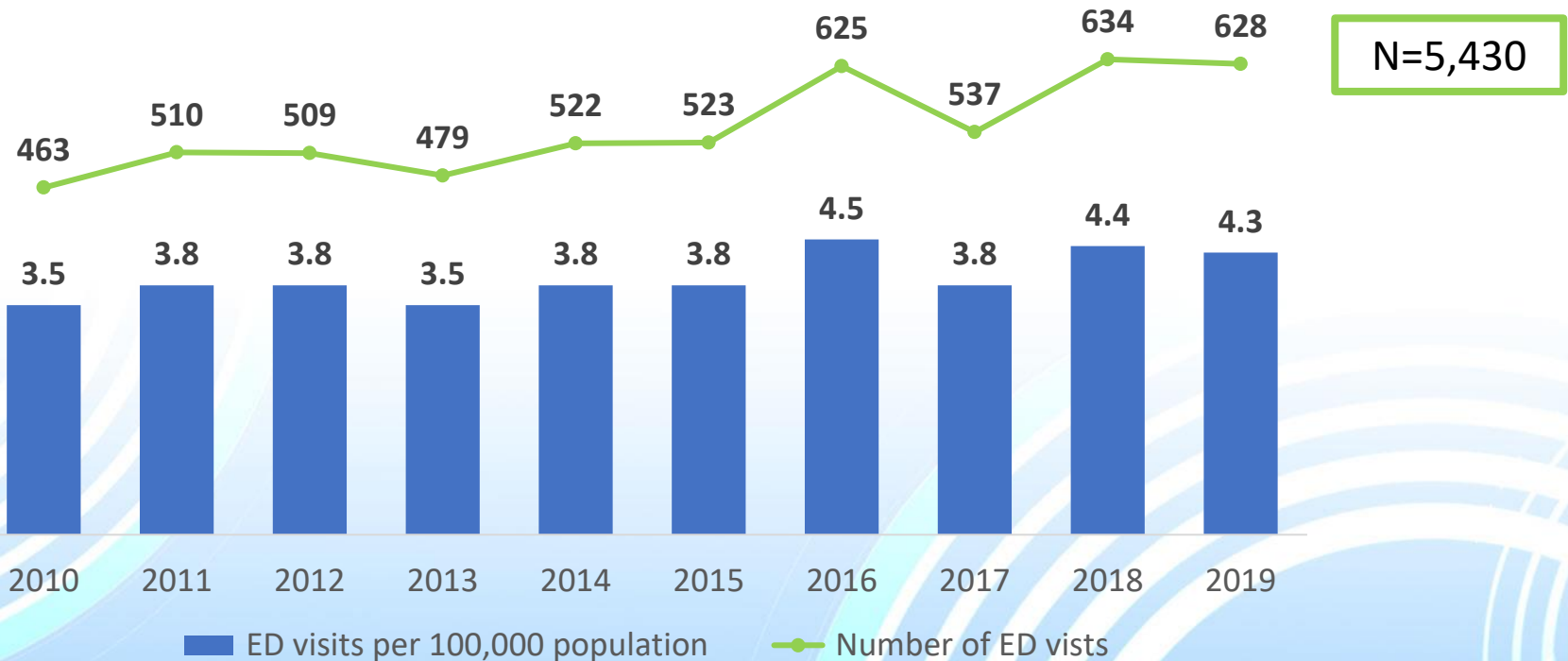
# Methods

- Data were made available by Public Health Ontario<sup>2</sup>
  - Canadian Institute for Health Information (CIHI)  
National Ambulatory Care and Reporting System (NACRS)
- Emergency department visits and hospitalizations in Ontario
  - ICD 10 codes: W65-W74, V90, V92
  - 2010-2019
- Crude annual death rates per 100,000 population were calculated
- Data were summarized by year, age and sex

2. <https://www.publichealthontario.ca/>

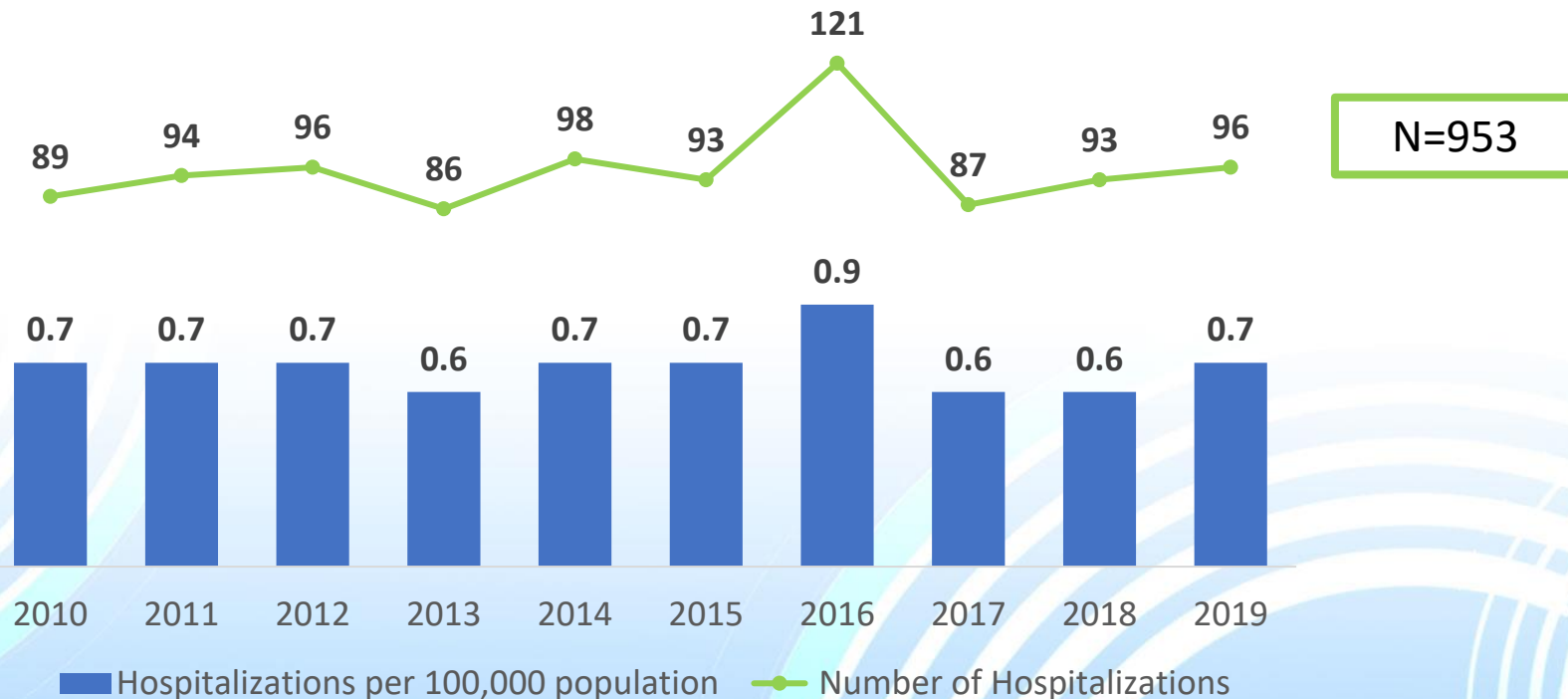
# Emergency department visits

NUMBER AND RATE OF EMERGENCY DEPARTMENT VISITS DUE TO NON-FATAL DROWNING, ONTARIO, 2010-2019



# Hospitalizations

NUMBER AND RATE OF HOSPITALIZATIONS DUE TO  
NON-FATAL DROWNING, ONTARIO, 2010-2019





# Fatal : Non-fatal Drowning

152

Average number  
of fatal drowning  
deaths each year

95

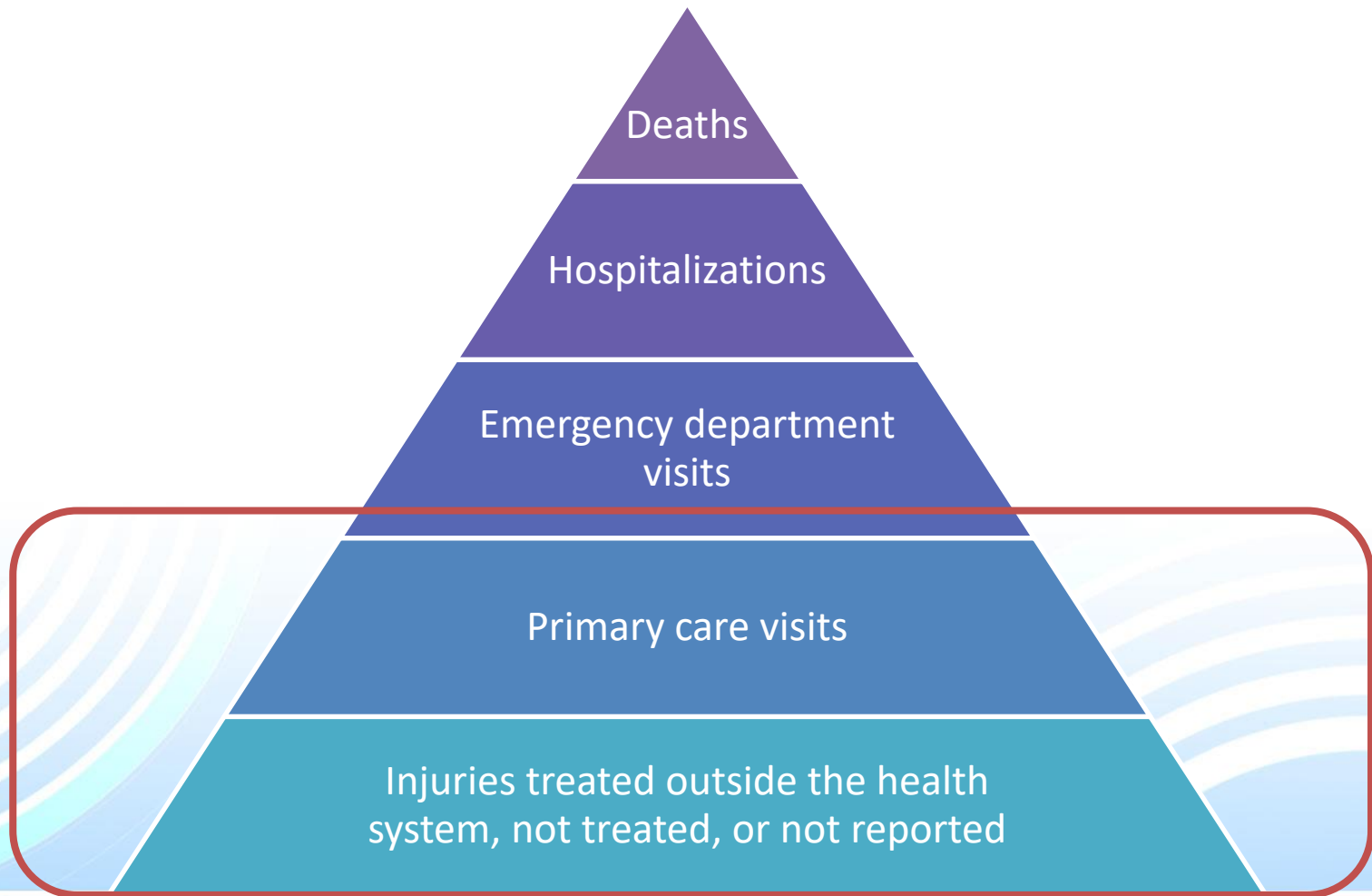
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Average emergency  
department visits  
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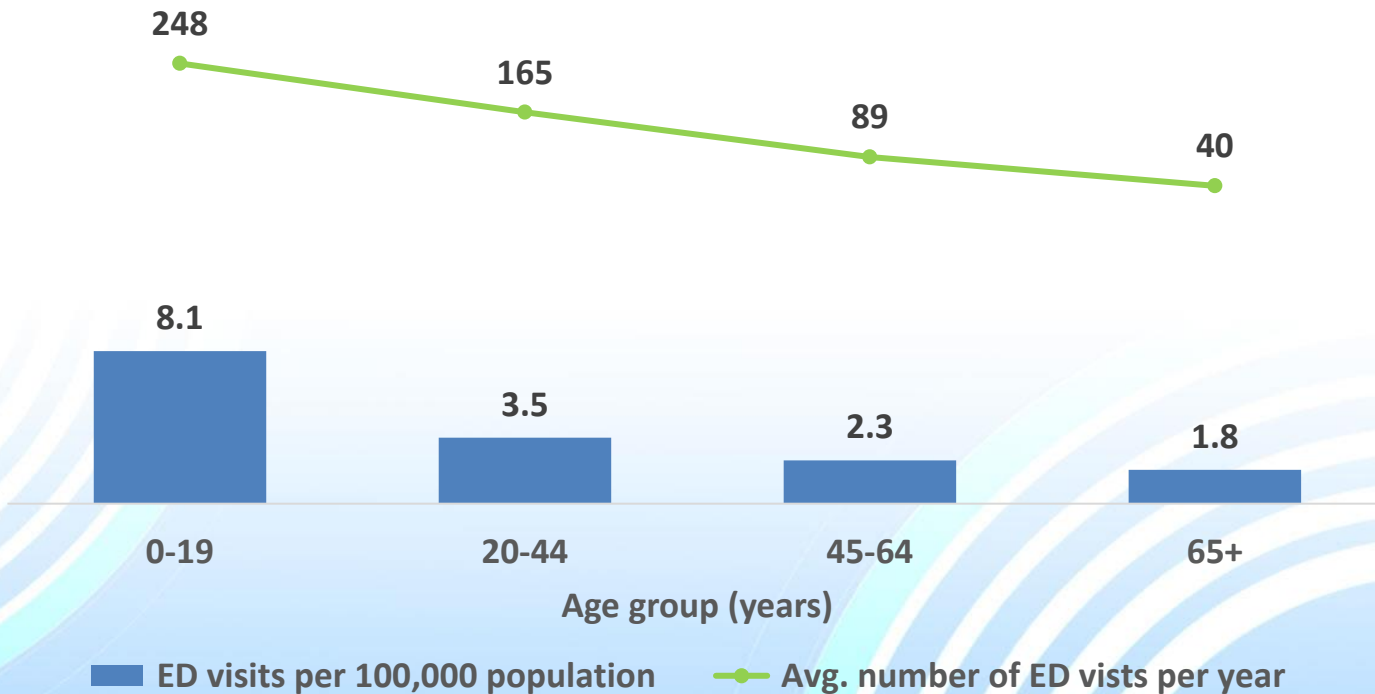
- For every **1 fatal drowning**, there were nearly **4 non-fatal drownings** requiring ED visit

# Fatal : Non-fatal Drowning



# Age

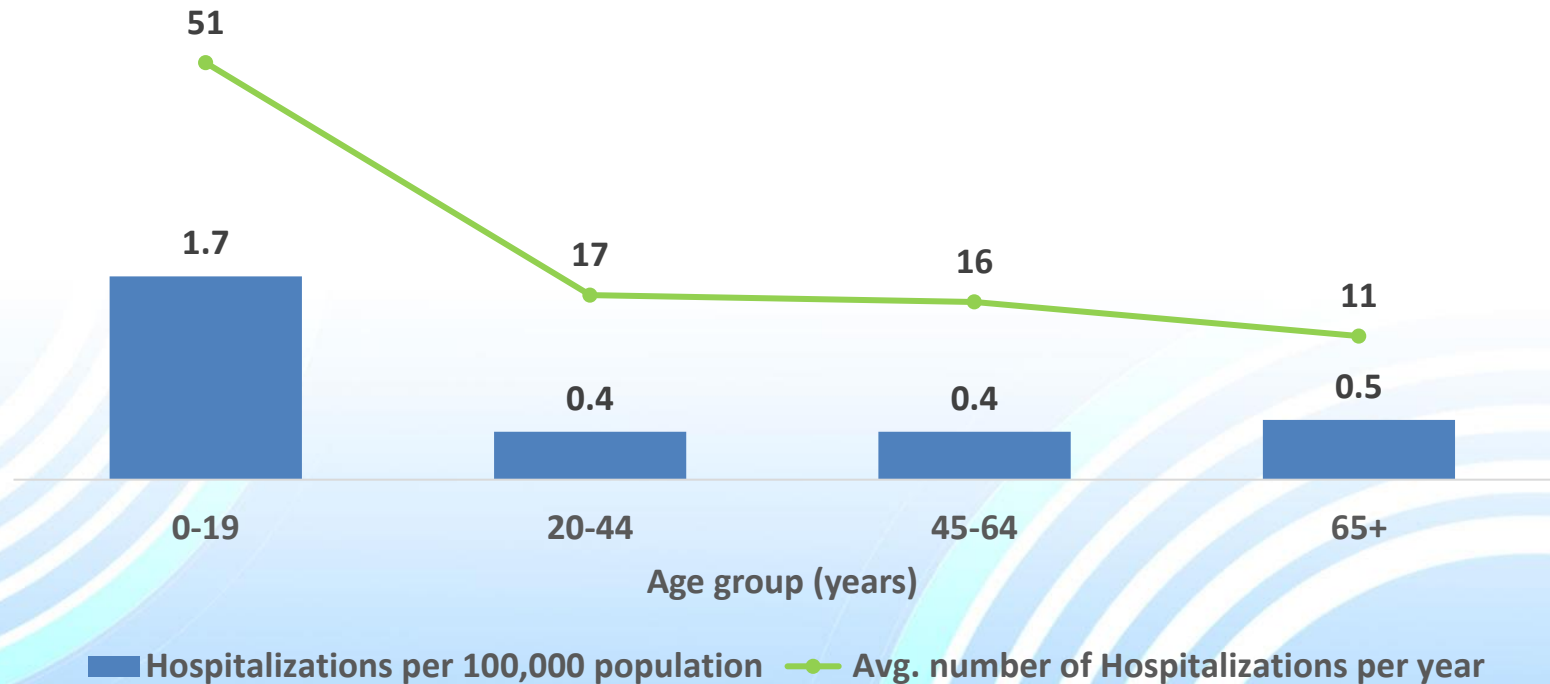
NUMBER AND RATE OF EMERGENCY DEPARTMENT VISITS DUE TO NON-FATAL DROWNING BY AGE GROUP, ONTARIO, 2010-2019





# Age

NUMBER AND RATE OF HOSPITALIZATIONS DUE TO NON-FATAL DROWNING BY AGE GROUP, ONTARIO, 2010-2019



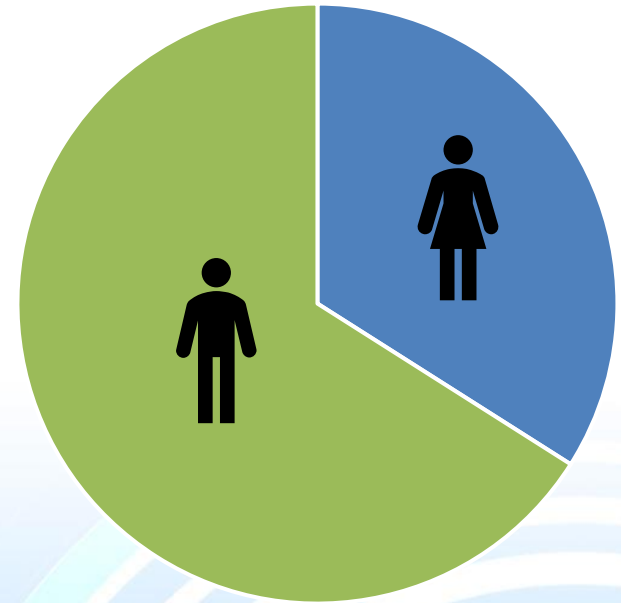
# Age



- Non-fatal drowning cases are younger than fatal drowning cases
- The highest fatal drowning rates in Ontario are among older adults 65+

# Sex

- 63% of ED visits and 66% of hospitalizations occurred among males
- The rate of ED visits and hospitalizations from non-fatal drowning was 1.7-1.8 times higher among males than females



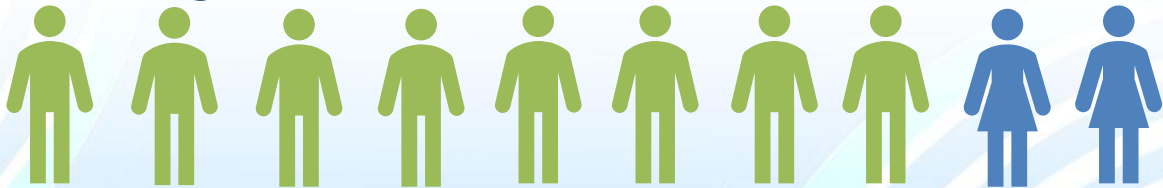


# Sex

Non-fatal drowning:



Fatal drowning:



# Summary

- 5,430 ED visits and 953 hospitalizations due to non-fatal drowning during 2010-2019
- ED visits due to non-fatal drowning increased
- Rates are highest among children and youth
- Males accounted for approximately two-thirds of non-fatal drownings



# Next steps

- More work is needed
  - The report provides a brief overview of non-fatal drowning in Ontario based on emergency department and hospitalization data
- More accurate reporting of the full burden of drowning

# Next steps

- Explore the use of novel data sources and methods to:
  - Obtain data on non-fatal drownings not captured in hospital data sources
  - Obtain more detailed information on the circumstances of non-fatal drownings to inform prevention



# Next steps

## Draft Non-fatal Drowning Categorization Framework (NDCF)

Severity of respiratory impairment after the drowning process stopped.		
Mild impairment	Moderate impairment	Severe impairment
<ul style="list-style-type: none"><li>Involuntary distressed coughing AND</li><li>Fully alert</li></ul>	<ul style="list-style-type: none"><li>Sustained difficulty breathing AND/OR</li><li>Disoriented but conscious</li></ul>	<ul style="list-style-type: none"><li>Not breathing AND/OR</li><li>Unconscious</li></ul>
Morbidity category (based upon any decline from previous functional capacity) at the time of measurement.		
No morbidity	Some morbidity	Severe morbidity
<ul style="list-style-type: none"><li>No decline</li></ul>	<ul style="list-style-type: none"><li>Some decline</li></ul>	<ul style="list-style-type: none"><li>Severe decline</li></ul>

# Conclusion

- Drowning can be fatal or non-fatal; non-fatal drowning can result in serious lifelong disability
- For every **one** fatal drowning, there are nearly **four** non-fatal drownings that require a visit to an emergency department
- The characteristics of non-fatal drowning differ from fatal drowning
- Non-fatal drowning is a serious problem in Ontario that warrants further research and action



# Acknowledgements

## Public Health Ontario

- Ontario Agency for Health Protection and Promotion (Public Health Ontario). Snapshots: Emergency Department Visits for injuries Snapshot: Emergency department visits for injuries due to near-drowning or submersion. Toronto, ON: Queen's Printer for Ontario; c2021 [updated 2021 Jan 29; cited 2021 Jun]. Available from: <https://www.publichealthontario.ca/en/data-and-analysis/injuries-data/injury-er-visits>
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# Questions?



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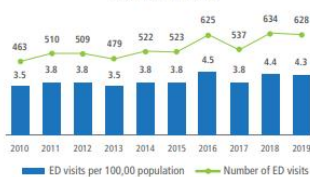
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Download the non-fatal drowning report at:

[www.lifesavingsociety.com](http://www.lifesavingsociety.com)



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