

Traumatic Brain Injury and the Health of Homeless People

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The Centre for Research on Inner City Health (CRICH)

is dedicated to reducing health inequities through innovative research affecting social change.

We are Canada's first and only interdisciplinary and hospital-based research centre working to improve the health of socially and economically disadvantaged urban populations.



Homelessness in Toronto



- 29,000 individuals used shelters in 2005
- 5,000 people homeless on any given night
 - 4,000 in shelters
 - 1,000 on the street, in hospitals, in jails
- Uncounted thousands of “hidden homeless”

Traumatic Brain Injury (TBI)

- Traumatic Brain Injury is caused by “a blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain.”
- Most commonly caused by falls, motor vehicle trauma, unintentional impacts, assaults, and sports-related injuries.
- 18,000 patients are admitted to hospital with brain injuries each year in Canada

Possible Connections between TBI and Homelessness

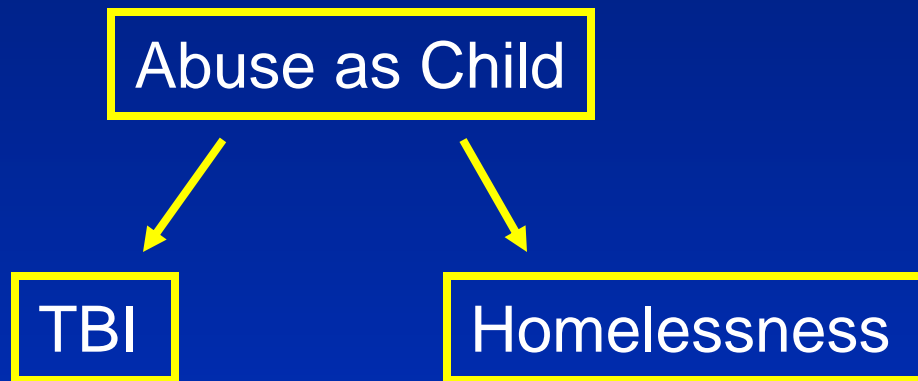
- Providing care for homeless individuals is sometimes difficult due to problematic behaviors
- Severe or repeated TBI can cause cognitive impairment, attention deficits, disinhibition, impulsivity, emotional lability
- In people who are homeless, are we seeing some of the long-term consequences of TBI?

Possible Connections between TBI and Homelessness



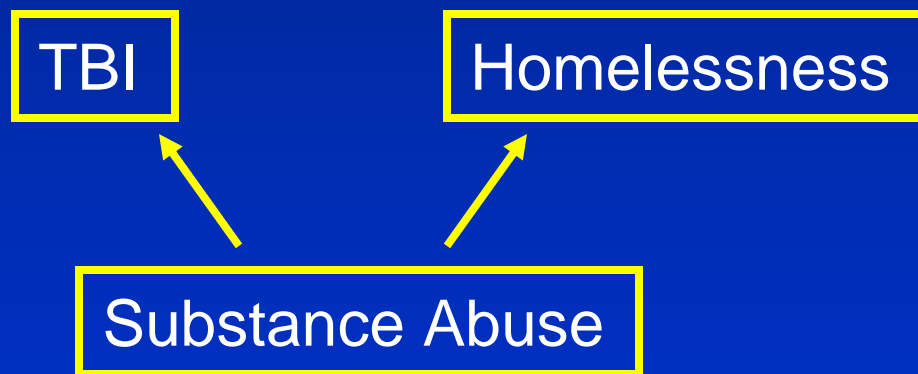
- Homelessness exposes individuals to unsafe environments and higher risk of injuries and assault

Possible Connections between TBI and Homelessness



- Physical abuse during childhood increases risk of homelessness as an adult, and can also result in TBI

Possible Connections between TBI and Homelessness



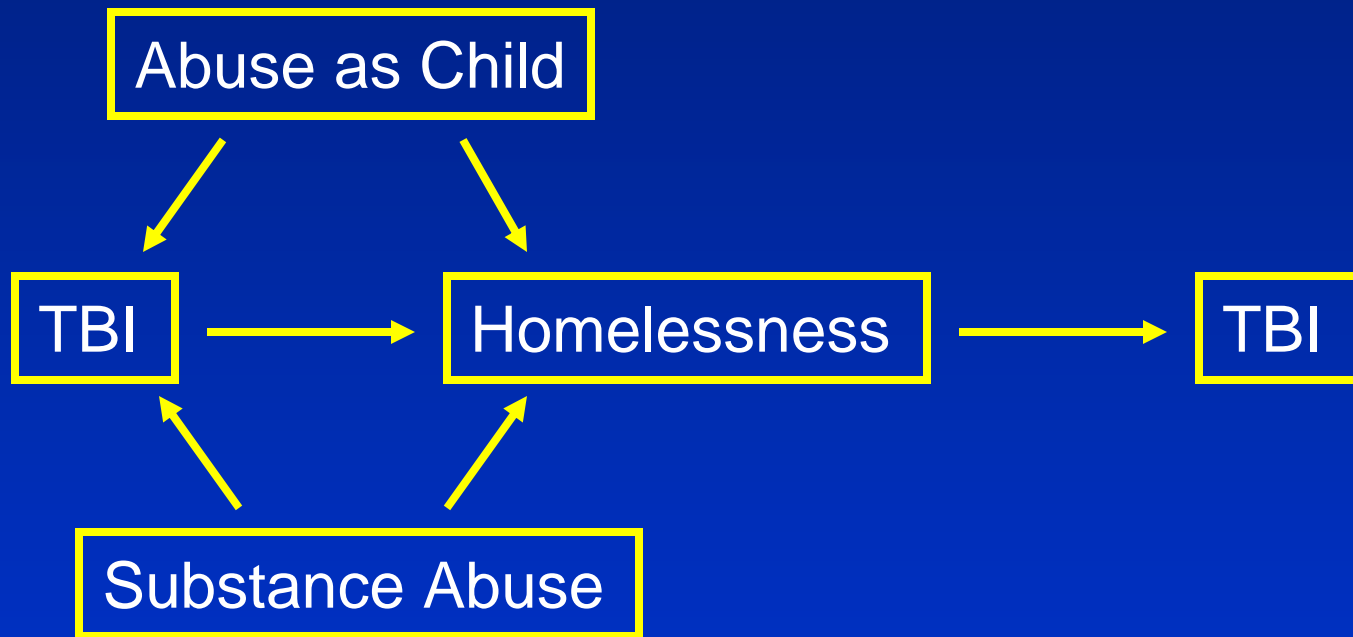
- Substance abuse increases risk of homelessness, and also increases risk of TBI

Possible Connections between TBI and Homelessness



- Brain dysfunction from previous TBI may contribute to the onset and perpetuation of homelessness

Homelessness and brain injuries: Cause or effect?



How common is traumatic brain injury among people who are homeless?

- Study of homeless individuals in Toronto in 2005
- Homelessness defined as living in a shelter, public place, vehicle, abandoned building, or someone else's place within the last 7 days, and not having a place of one's own
- Recruited at 50 shelters and 18 meal programs

How common is traumatic brain injury among people who are homeless?

- 76% agreed to participate
- Data on 904 individuals
- Homeless families not included in this presentation

History of TBI

- “Have you ever had an injury to the head which knocked you out or at least left you dazed, confused, or disoriented?”
- Number of head injuries
- Date or age at time of head injuries
- Whether unconscious after head injury
- Duration of unconsciousness

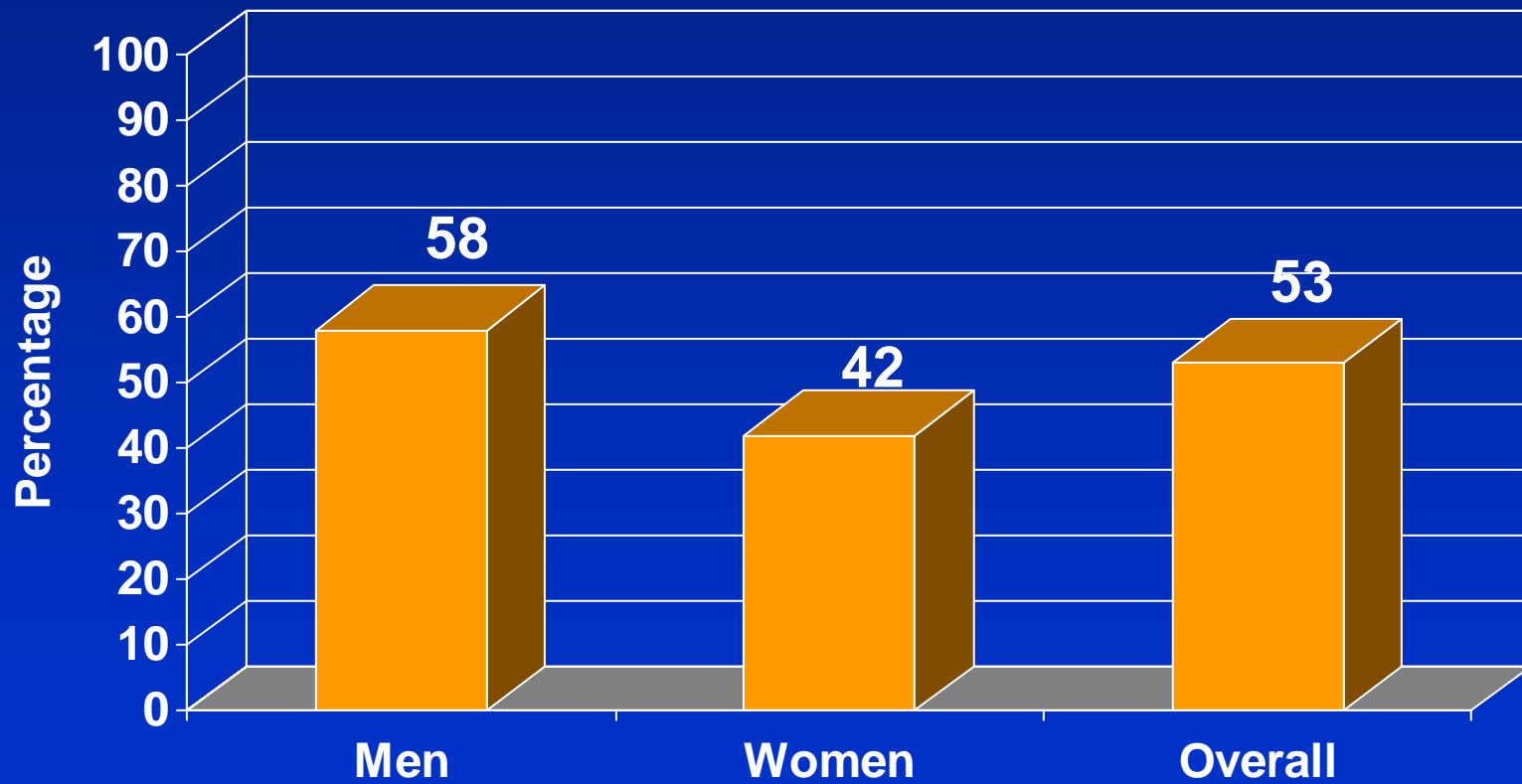
History of TBI

- Mild TBI: no loss of consciousness, or unconsciousness less than 30 minutes
- Moderate/Severe TBI: unconsciousness more than 30 minutes

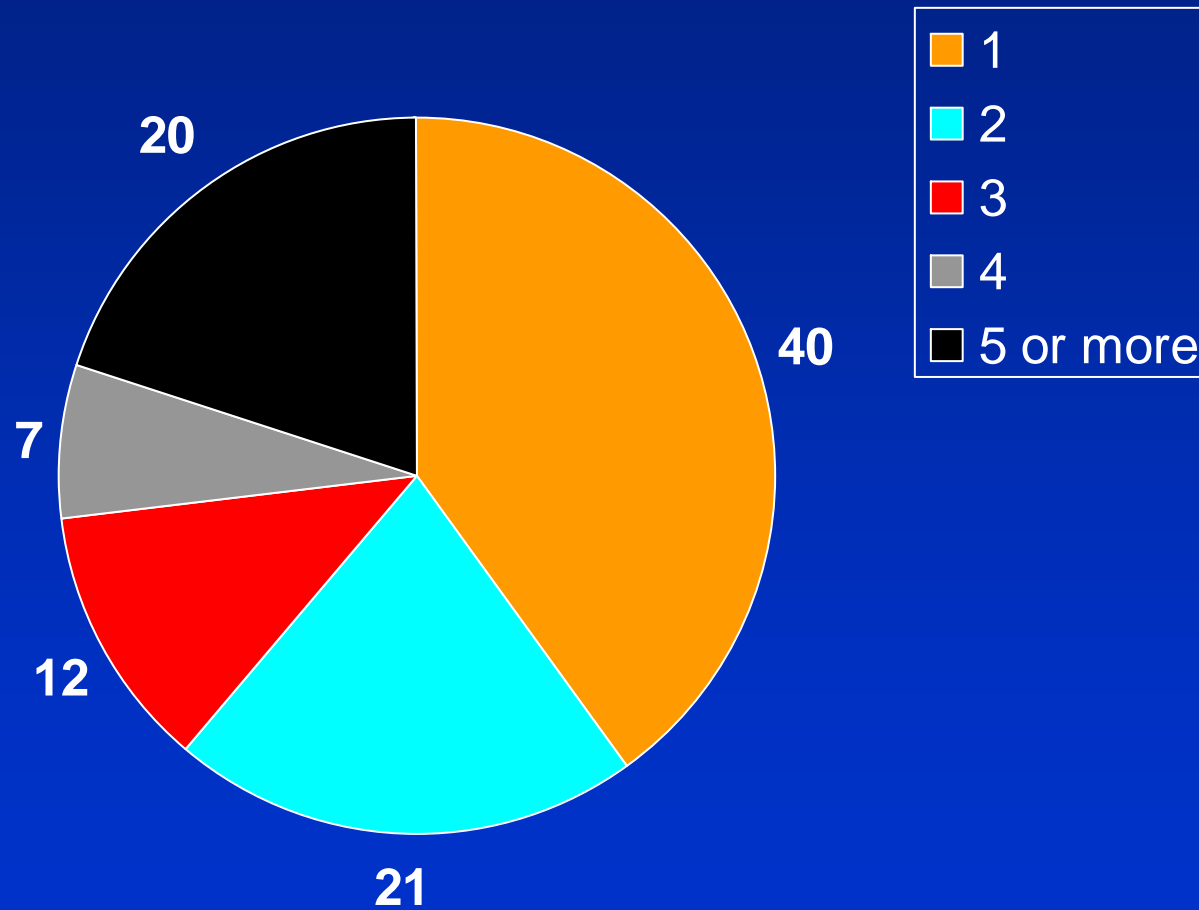
Demographics

- Average Age: 37 years
- Male 67%, Female 34%
- Born Outside Canada: 27%
- Average age at first episode of homelessness: 29 years
- Average lifetime duration of homelessness: 4.4 years

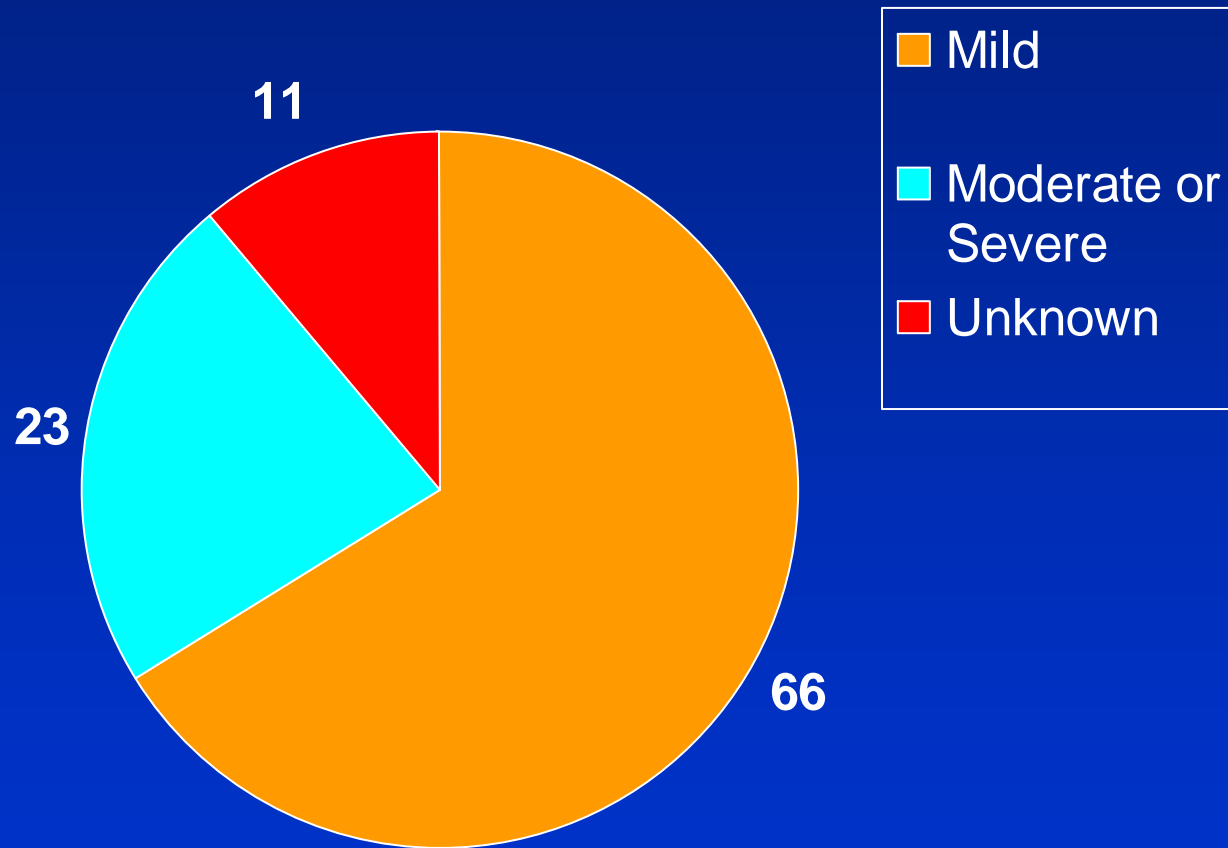
Lifetime History of TBI



Number of TBIs in Lifetime



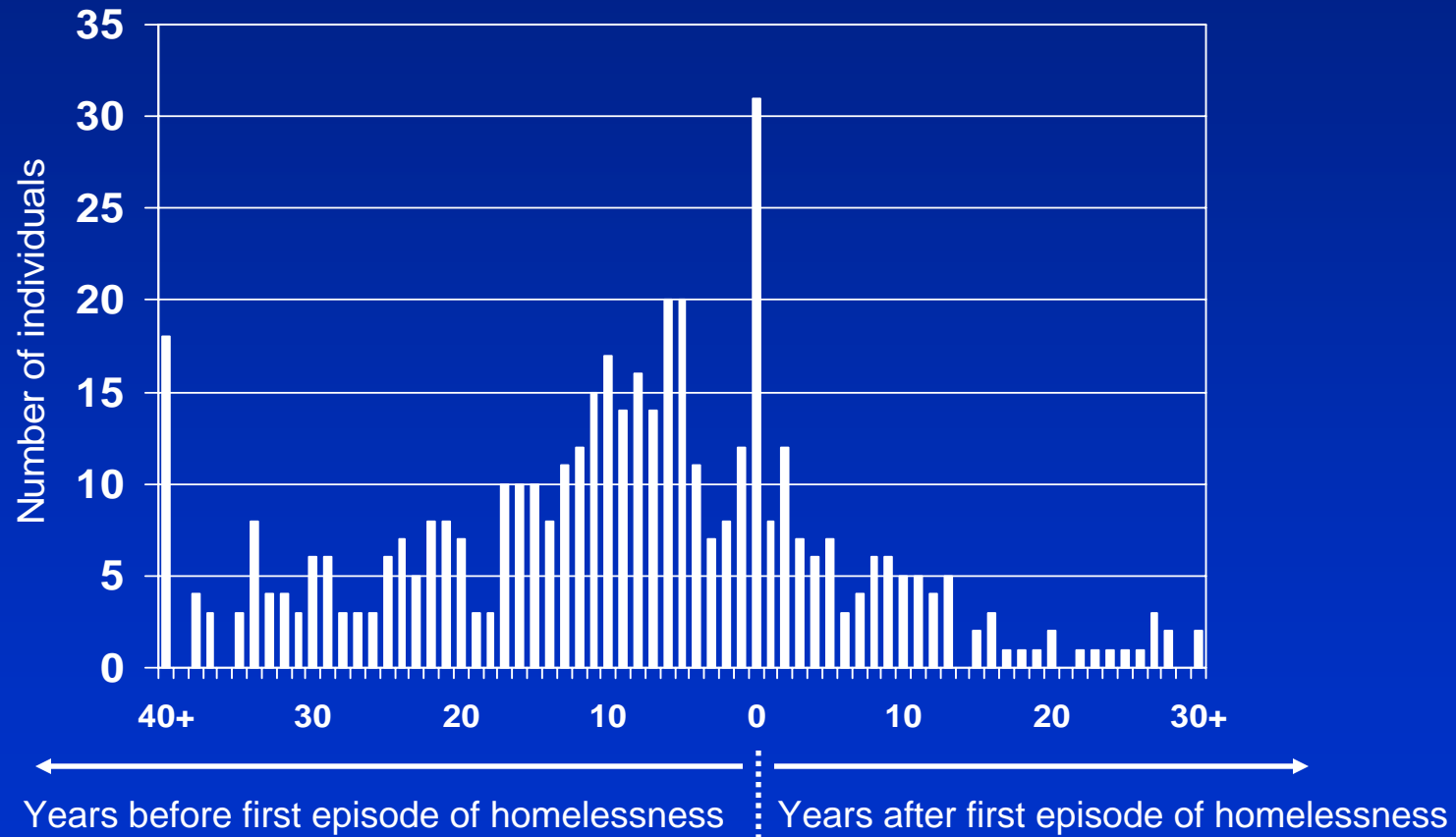
Severity of Worst TBI



TBI History

- Average age at first TBI: 18 years
- Average age at first episode of homelessness:
29 years

Time of first TBI compared to first episode of homelessness



Association of TBI with Seizures

	<u>Odds Ratio</u>
No TBI	1.0
Mild TBI	2.6
Mod/Severe TBI	3.1

Model adjusted for sex, age, race, place of birth, education, and lifetime duration of homelessness

Association of TBI with Mental Health Problems

	<u>Odds Ratio</u>
No TBI	1.0
Mild TBI	1.3
Mod/Severe TBI	2.5

Association of TBI with Alcohol Problems

	<u>Odds Ratio</u>
No TBI	1.0
Mild TBI	1.5
Mod/Severe TBI	1.7

Association of TBI with Drug Problems

	<u>Odds Ratio</u>
No TBI	1.0
Mild TBI	1.7
Mod/Severe TBI	1.7

Association of TBI with Mental Health Status

Ave. Difference

No TBI	0
Mild TBI	-4.5
Mod/Severe TBI	-8.1

Association of TBI with Physical Health Status

Ave. Difference

No TBI	0
Mild TBI	-3.9
Mod/Severe TBI	-5.9

Summary of Research Findings

- TBI is very common in a representative sample of homeless people
 - 58% in men, 42% in women
- These rates are more than 5 times higher than in the general population, and are comparable to the rates found among prison inmates

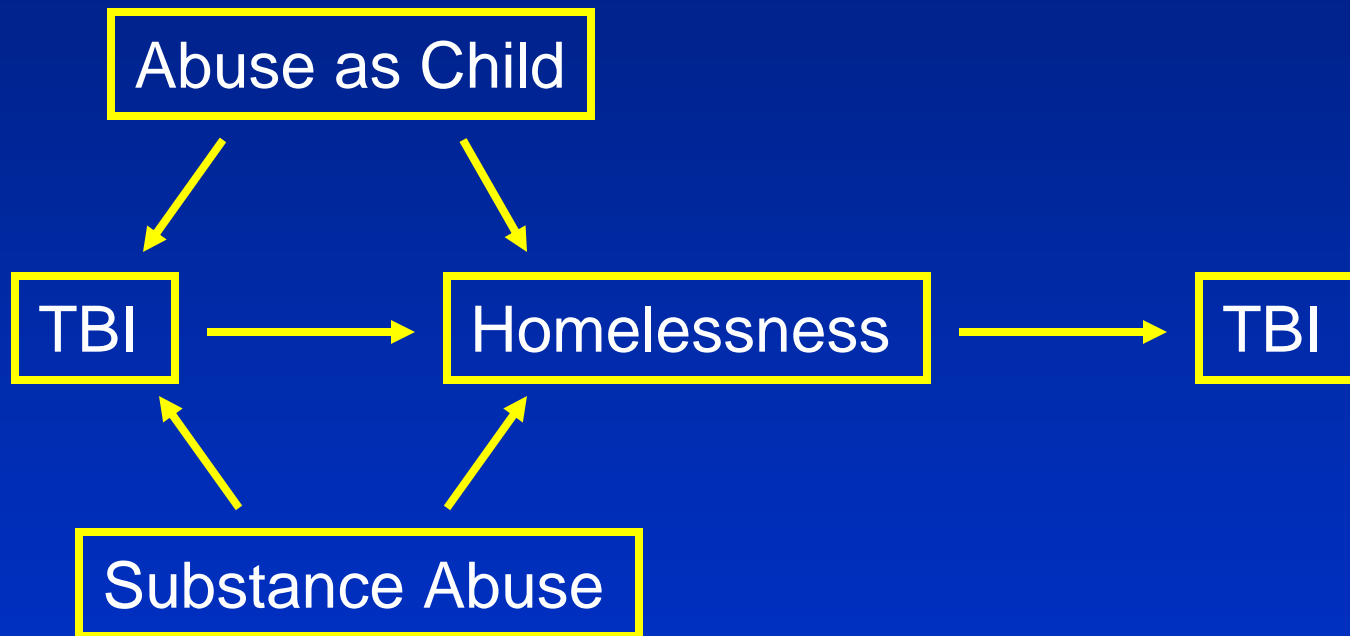
Summary of Research Findings

- History of TBI is strongly associated with a number of adverse health outcomes
 - Seizures
 - Mental health problems
 - Drug and alcohol problems
 - Worse mental health
 - Worse physical health

Summary of Research Findings

- First TBI usually happened before the first episode of homelessness
- Is TBI a causal factor contributing to the onset of homelessness?

Homelessness and brain injuries: Cause or effect?



Research Team

- Angela Colantonio, PhD, O.T. Reg.
- Shirley Chiu, MA
- George Tolomiczenko, PhD, MPH, MBA
- Alex Kiss, PhD
- Marko Katic, BA
- Laura Cowan, BScN
- Donald A. Redelmeier, MD, MSHSR
- Wendy Levinson, MD

Acknowledgments

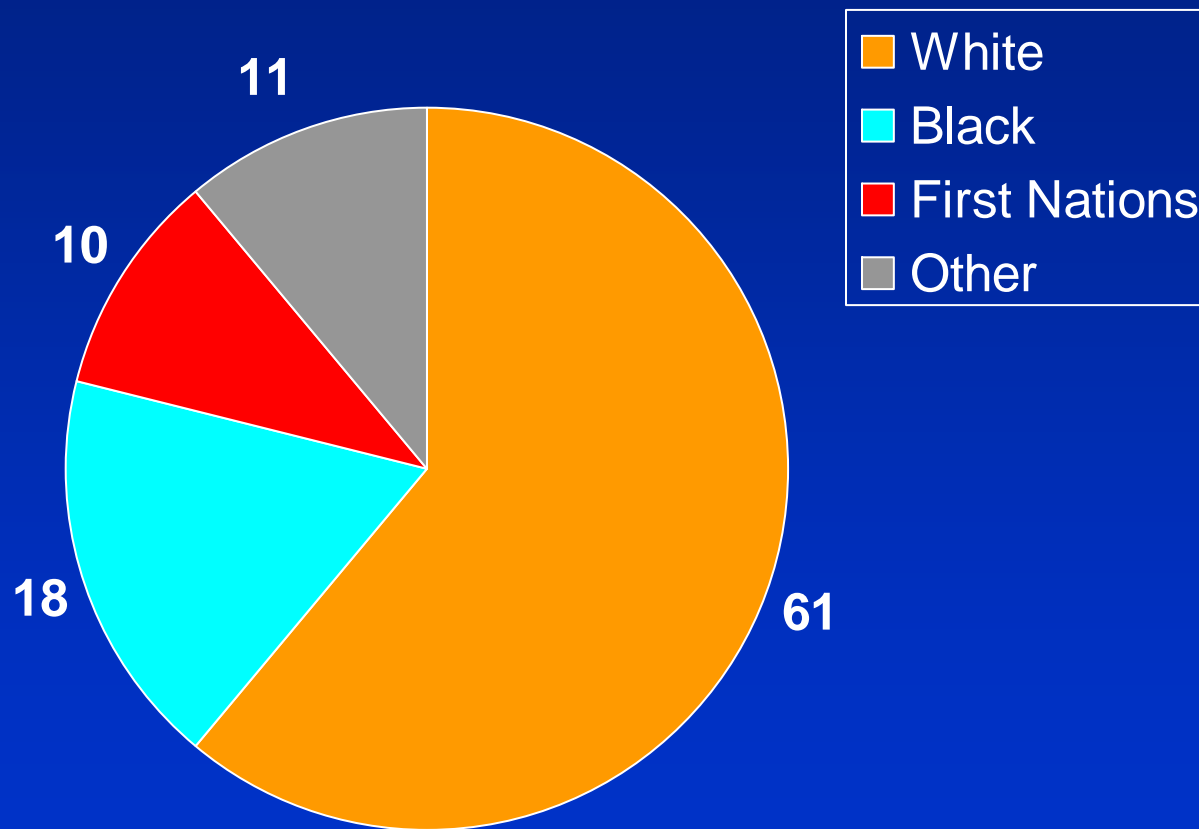
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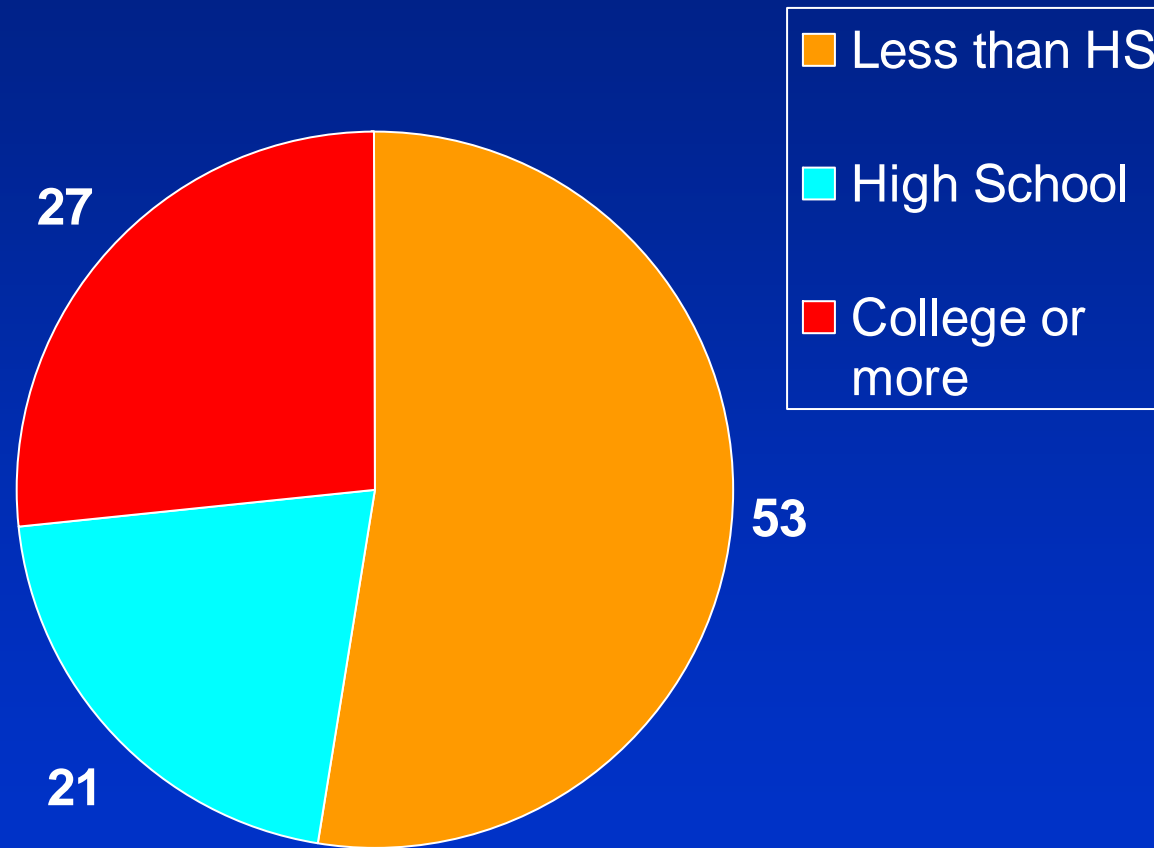
Thank you!



Race / Ethnicity



Education



TBI vs. no TBI

<u>Sex</u>	<u>TBI</u>	<u>No TBI</u>
Male	73%	59%
Female	27%	41%

TBI vs. no TBI

<u>Race</u>	<u>TBI</u>	<u>No TBI</u>
White	68%	52%
Black	10%	27%
First Nations	10%	11%
Other Race	10%	12%

TBI vs. no TBI

<u>Place of Birth</u>	<u>TBI</u>	<u>No TBI</u>
Canada	82%	64%
Outside Canada	18%	36%

TBI vs. no TBI

	<u>TBI</u>	<u>No TBI</u>
Age at first episode of homelessness	27.5	29.6
Lifetime years of homelessness	4.9	3.8

TBI vs. no TBI

	<u>TBI</u>	<u>No TBI</u>
Seizures (ever)	22%	8%
Mental health problems	43%	33%
Alcohol problems	42%	28%
Drug problems	57%	40%

TBI vs. no TBI

	<u>TBI</u>	<u>No TBI</u>
SF-12 Mental subscale	39.0	43.8
SF-12 Physical subscale	43.9	48.1

Limitations

- History of TBI based on self reports, subject to recall bias
- Self-reports not confirmed through review of health records
- Information not collected on the mechanism or circumstances of TBI
- Participants did not undergo formal testing for neuro-psychological dysfunction

Implications for Service Providers

- Clinicians should routinely screen individuals who are homeless for history of TBI
- TBI should be considered a possible cause of cognitive dysfunction and behavioral problems among individuals who are homeless

Implications for Service Providers

- Persons with brain injuries may have attention deficits, making it difficult for them to focus on tasks and understand, remember, or respond to directions
- These individuals may need more time to follow instructions; slowness should not be misinterpreted as a lack of effort or cooperation
- TBI-related brain dysfunction can predispose to irritability or impulsivity that should be understood in the context of the person's previous injury

Implications for Housing

- Provision of permanent supportive housing may be necessary to end homelessness among individuals with significant impairments due to TBI

Implications for Prevention

- Prevention of TBI may play a role in the prevention of homelessness
 - Child abuse
 - Substance use during adolescence
 - Risk behaviors during adolescence
- Rehabilitation after TBI may play a role in the prevention of homelessness
 - Especially in disadvantaged populations