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# Introduction

- Firearm-related injuries are a significant and preventable cause of morbidity and mortality in Canada [1].
- Since the 1990s, there have been approximately 1,300 deaths from firearms annually, primarily due to suicide and homicide.
- Regrettably, Canada has one of the highest firearm suicide rates in the developed world, accounting for about 75% of all firearm deaths [2].
- Mortality rates vary considerably across Canadian jurisdictions for both self-inflicted firearm injuries and assaults.
- Risk factors associated with firearm injury include male gender, age, low socioeconomic status, immigrant status, mental illness and firearm availability [3-5].
- There is evidence that rates of violent injury in Canada are increasing [6].
- In 2020, the deadliest mass shooting in Canadian history occurred when a gunman took 22 lives in a rampage that began in the rural town of Portapique, Nova Scotia.
- In response to this tragedy, the Heal-NS Research Program was created to investigate topics related to the misuse of firearms.
- The primary objective of this study was to describe the epidemiology of firearm-related injury and death in Nova Scotia.
- As a secondary objective, we sought to assess for factors associated with mortality in trauma patients with gunshot injuries.

## Methods

- Retrospective cohort study of data collected from the Nova Scotia Trauma Registry (NSTR) and Nova Scotia Medical Examiner Service database over a 19-year study period (April 1 2001 to March 31 2020).
- We included all major firearm-related traumas in Nova Scotia during the study period. Any deaths at the scene or during transport were included.
- Injury rates were evaluated over time, by age and sex, and by intent (assault/homicide, self-harm, other).
- Data were collected on patient demographics, injury characteristics, injury severity, patient transport, intubation, and Trauma Team Activation (TTA).
- ArcGIS was used for geospatial mapping of injury rates by county.
- Characteristics of survivors and non-survivors were compared using t-tests and chi-square analysis.
- A multivariate logistic regression model was created to assess predictors of mortality; covariates included age, sex, Injury Severity Score (ISS), TTA, intubation (scene or in ED), and intent (assault, self-harm, other).



### Table 1: Pa

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Age, mean : Male sex, n Urban reside ISS, mean ± GCS at scen Intubated (so Trauma tean Intent of injui Homicide/a Self-inflicte \_\_\_\_\_ Unintentior Undetermi

ISS, Injury Severity Score; GCS, Glasgow Coma Score; ED, emergency department; SD, standard deviation.

### Table 2. Trauma outcomes, overall and by intent of injury

### Outcome

In-hospital L ICU LOS, SCU LOS, Ventilator da **Overall mort** Pre-hospit In-hospital,

Variable	Adjusted OR	95% CI	p-value
Age	1.022	1.001 – 1.043	0.038
Male sex (REF: Female)	0.665	0.163 – 2.703	0.57
ISS	1.106	1.068 – 1.146	< 0.001
TTA (REF: No TTA)	0.042	0.019 – 0.092	<0.001
Intubation at scene or in ED (REF: No Intubation)	1.173	0.524 – 2.625	0.70
Intent (REF: Other)			
Assault	2.554	0.918 – 7.104	0.072
Self-harm	2.554	2.398 – 17.277	<0.001

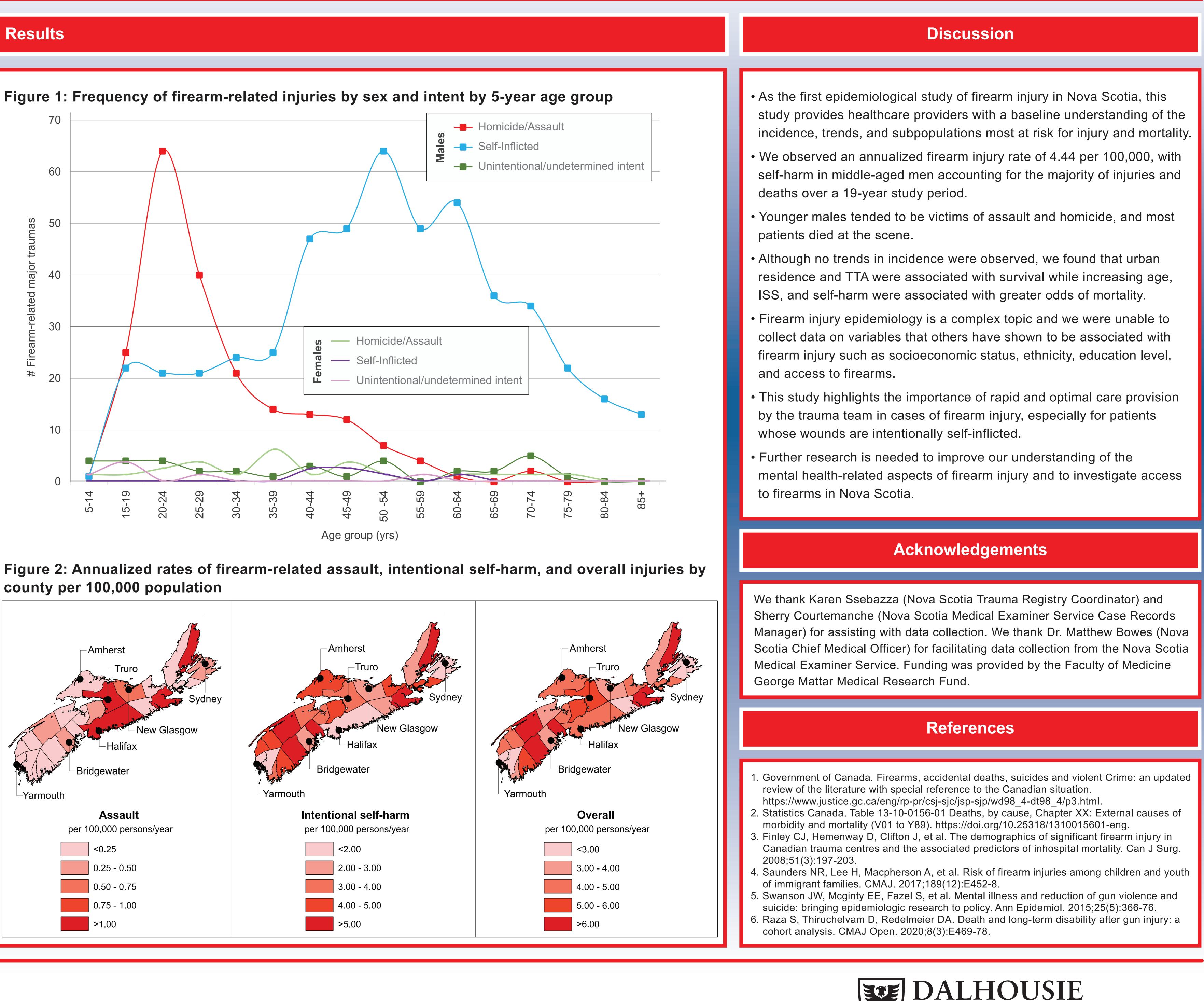
# A Population-Based Study on the Epidemiology of Firearm-Related Injury in Nova Scotia

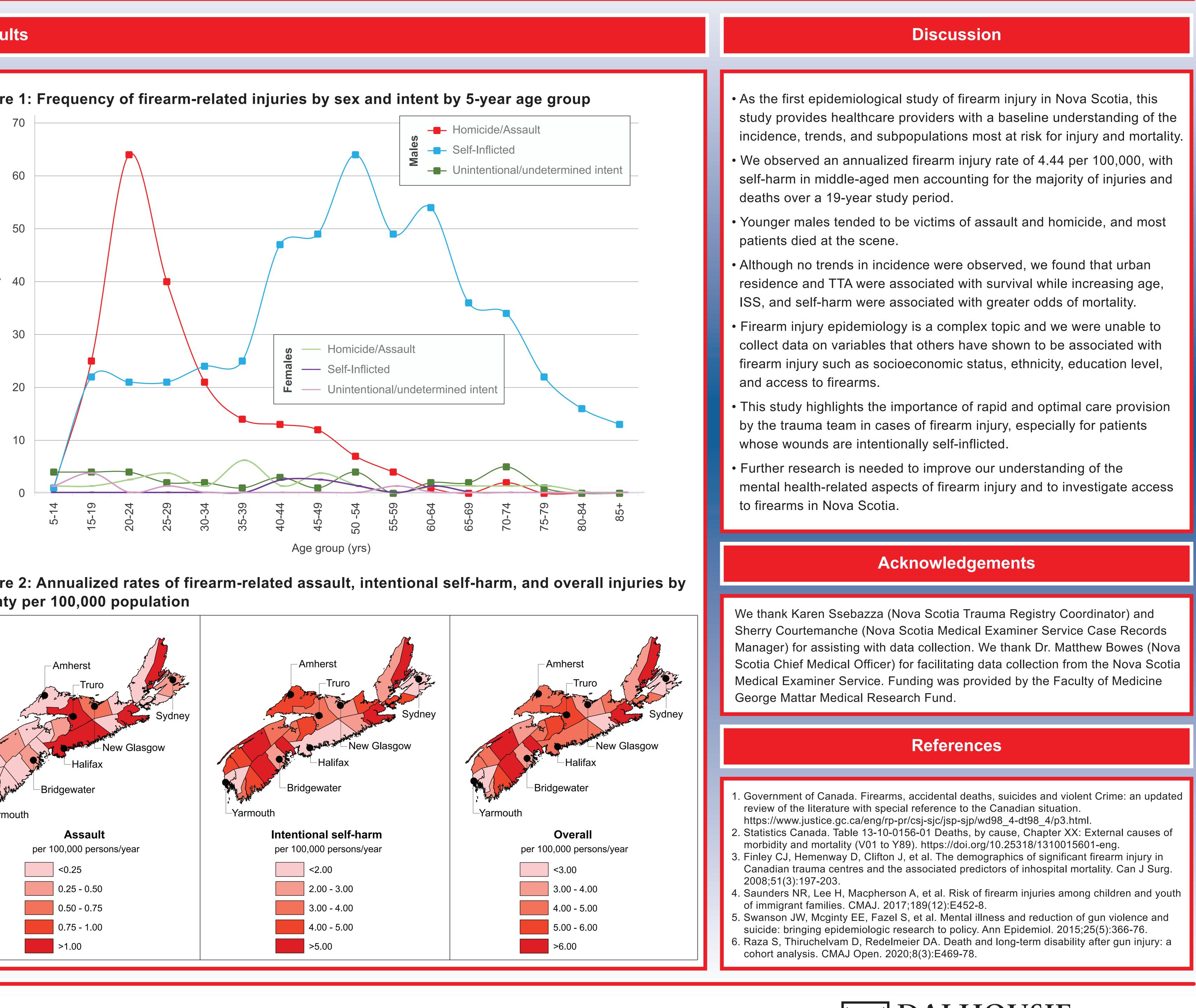
45.0 ± 19.2 742 (95.6) 396 (51.0)	32.6 ± 15.6 205 (94) 165 (75.7)	49.9 ± 18.3 537 (96.2)	<0.001 0.18
		· · · · · ·	0.18
396 (51.0)	165 (75.7)		
		231 (41.4)	<0.001
25.1 ± 18.8	11.8 ± 8.7	30.7 ± 19.2	<0.001
11.8 ± 4.9	14.4 ± 2.0	6.0 ± 4.6	<0.001
120 (15.0)	58 (26.6)	62 (11.1)	<0.001
215 (27.7)	180 (82.6)	35 (6.27)	<0.001
			<0.001
231 (29.8)	148 (67.9)	83 (14.9)	
504 (64.9)	40 (18.3)	464 (83.2)	
28 (3.6)	22 (10.1)	6 (1.1)	
13 (1.7)	8 (3.7)	5 (0.9)	
	$11.8 \pm 4.9$ $120 (15.0)$ $215 (27.7)$ $231 (29.8)$ $504 (64.9)$ $28 (3.6)$	$11.8 \pm 4.9$ $14.4 \pm 2.0$ $120 (15.0)$ $58 (26.6)$ $215 (27.7)$ $180 (82.6)$ $231 (29.8)$ $148 (67.9)$ $504 (64.9)$ $40 (18.3)$ $28 (3.6)$ $22 (10.1)$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

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	Overall (n = 776)	Assault (n = 224)	Intentional self- harm (n = 490)	Other (n = 62)		
LOS (days), mean ± SD	11.7 ± 21.4	8.9 ± 16.2	21.9 ± 33.5	8.1 ± 9.3		
, mean ± SD	4.1 ± 6.9	$3.9 \pm 7.4$	5.9 ± 7.1	1.1 ± 1.3		
S, mean ± SD	2.4 ± 6.4	2.2 ± 4.2	3.2 ± 10.0	1.6 ± 2.1		
lays, mean ± SD	3.6 ± 5.7	$3.9 \pm 6.3$	4.0 ± 5.7	$1.4 \pm 0.9$		
rtality, n (%)	558 (71.9)	81 (36.2)	453 (92.4)	24 (38.7)		
ital, n (%)	500 (64.4)	50 (22.3)	428 (87.3)	22 (35.5)		
al, n (%)	58 (7.5)	31 (13.8)	25 (5.1)	n < 5		

LOS, length of stay; ICU, intensive care unit; SCU, special care unit; SD, standard deviation.

# Table 3. Predictors of mortality in trauma patients with firearm injuries





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