Trends in Adolescent Firearm-Related Injury: A Time Series Analysis

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Background

- Firearm related injury (FRI) became leading cause of death among children and adolescents in 2020
- Nationally, FRI accounts for 20% of all adolescent mortality
- Scarce literature on specific variation in different geographic regions

Objective

To investigate trends in adolescent FRI in Atlanta, GA over the last 5 years to identify areas for targeted intervention

Methods

- Retrospective cohort review of Grady Health System, Atlanta Medical Center and Children's Hospital of Atlanta
- January 2016- June 2021
- Inclusion criteria:
  - Adolescents, age 11-21
  - FRI defined by ICD 9/10 codes
- Time series analysis conducted - data stratified by year and outcomes compared with Dickey-Fuller testing and univariable linear regression

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Results

Table 1: Citywide patterns of FRI in adolescents in Atlanta, GA from 2016-2021

Variable	Overall	2016	2017	2018	2019	2020	2021*
Total	1453	219	216	205	253	364	196
Age (median, years)	18	19	18	19	18	18	18
Males	1259 (86.6%)	201 (91.8%)	188 (87.0%)	177 (86.3%)	212 (83.8%)	311 (85.4%)	170 (86.7%)
Race							
Black	1259 (86.6%)	194 (88.6%)	190 (88.0%)	181 (88.3%)	205 (81.0%)	318 (87.4%)	171 (87.2%)
White	106 (7.3%)	14 (6.4%)	12 (5.6%)	14 (6.8%)	32 (12.6%)	21 (5.8%)	13 (6.6%)
Asian/PI	7 (0.5%)	0 (0.0%)	2 (0.9%)	0 (0.0%)	0 (0.0%)	3 (0.8%)	2 (1.0%)
Other/Unknown	81 (5.65)	11 (5.1%)	12 (5.6%)	10 (4.9%)	16 (6.3%)	22 (6.0%)	10 (5.1%)
Ethnicity							
Hispanic/Latino	65 (4.5%)	4 (1.8%)	6 (2.8%)	9 (4.4%)	20 (7.9%)	17 (4.7%)	9 (4.6%)
Non-Hispanic/ Latino	1378 (94.8%)	213 (97.3%)	207 (95.8%)	197 (96.1%)	231 (91.3%)	344 (94.5%)	186 (94.9%)
Unknown	15 (1.0%)	3 (1.4%)	3 (1.4%)	0 (0.0%)	4 (1.6%)	4 (1.1%)	1 (0.5%)
ISS (mean)	12.9	13.8	12.9	13	13.7	11.6	12.7
Mortality	173 (11.9%)	35 (16.0%)	35 (16.2%)	23 (11.2%)	31 (12.3%)	34 (9.3%)	15 (7.7%)

*Data through June 2021

Figure 1: Intentionality of firearm related injury in adolescents in Atlanta, GA from 2016-2021

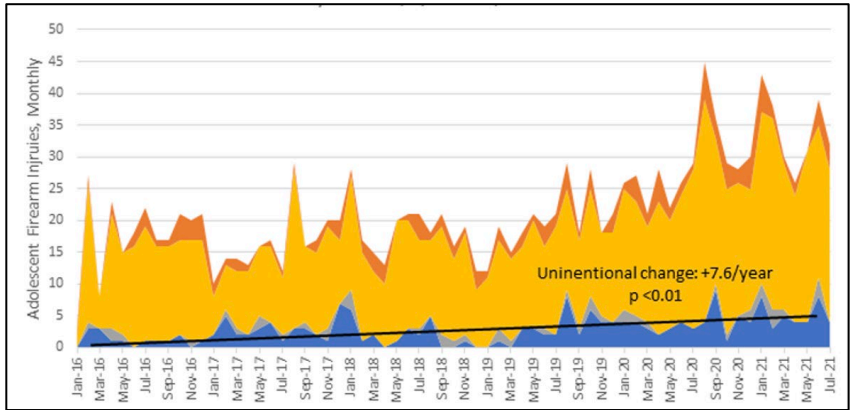

Table 2: Multivariate analysis for mortality in citywide FRI in adolescents

Variable	OR	P-value
Age (per +1 year)	1.16 [1.08, 1.25]	<0.001*
Gender (vs. male)	1.21 [0.69, 2.26]	0.53
Race (vs. Black)		
Other	2.32 90.93, 5.50]	0.06
White	0.81 [0.31, 1.88]	0.64
Ethnicity (vs. non)		
Hispanic or Latino	1.12 [0.37, 3.47]	0.84
Mechanism (vs. intentional)		
Self-inflicted	3.42 [1.53, 7.58]	<0.001*
Unintentional	0.24 [0.06, 0.70]	0.02*
Unknown	1.34 [0.71, 2.41]	0.35
Year (vs. 2016)		
2017	1.10	0.75
2018	0.58	0.11
2019	0.62	0.13
2020	0.52	0.03*

Conclusions

- FRI among adolescents remains a public health epidemic
- Steady decline in mortality rate suggests improving ability to care for this patient demographic
- In context of pivotal time for firearm policy reform, data can provide critical evidence for targeted intervention and law
- Alarming increase in the incidence of injury secondary to unintentional discharge, suggesting efforts within Atlanta should focus on safe storage practices among firearm owning households