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Short communication

Systematic disparities in reporting on community firearm violence on local television news in Philadelphia, PA, USA

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ABSTRACT

Objective: To better understand how community firearm violence (CFV) is communicated to the public, we aimed to identify systematic differences between the characteristics of shooting victims and events covered on television news and all shootings in Philadelphia, PA, a city with escalating CFV incidence.
Methods: We compiled a stratified sample of local television news clips covering shootings that occurred in Philadelphia aired on two randomly selected days per month from January-June 2021 (n = 154 clips). We coded the clips to determine demographic and geographic information about the shooting victims and events and then matched coded shootings with corresponding shootings in the Philadelphia police database. We compared characteristics of shooting victims and shooting event locations depicted in television clips (n = 62) with overall characteristics of shootings in Philadelphia during the study period (n = 1082).
Results: Compared to all individuals shot, victims whose shootings were covered on local television news more likely to be children and more likely to be shot in a mass shooting. The average median household income of shooting locations featured on television was significantly higher than the median household income across all shooting locations ($60,302 for television shootings vs. $41,233 for all shootings; p = 0.002). Shootings featured on television occurred in areas with lower rates of income inequality and racialized economic segregation compared to all shooting locations.
Conclusions: Television news outlets in Philadelphia systematically over-reported shootings of children, mass shootings, and shootings that occurred in neighborhoods with higher median household income, less socioeconomic inequality, and lower rates of racialized economic segregation.

1. Introduction

Community firearm violence (CFV), including fatal and non-fatal shootings that result from interpersonal violence, largely impacts people from structurally marginalized racial groups and is geographically concentrated in neighborhoods where racist policies have resulted in systemic disinvestment and disadvantage in the United States (US) (Mehranbod et al., 2022). For people not directly impacted by CFV, news reports may be the only window into understanding the epidemiology, root causes, and solutions to this public health problem. Previous research has demonstrated that media do not cover all episodes of violence equally (Beard et al., 2019; Dixon, 2017; Kaufman et al., 2020). Many shootings that occur as a result of CFV receive no media coverage. One study found just 46.2 % of shooting victims made the news in Philadelphia, and media reports overrepresented fatal shootings, shootings of women, and mass shootings compared to their epidemiologic frequency (Kaufman et al., 2020). While informative, that study used data from Gun Violence Archive as a proxy for reported shootings and did not examine news content directly (Kaufman et al., 2020). There is a dearth of empirical studies that analyze news reporting

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about CFV, indicating a need for more research in this area to better understand and respond to the ongoing CFV epidemic.

We examined media content on CFV in Philadelphia by drawing on existing communication research on agenda setting and framing theories. Agenda setting literature evaluates how media narratives set the public agenda. Research in this area has shown that media organizations shape public perception of an issue's importance at a given time, affect audience perception of an issue as positive or negative, and build connections between issues or events for an audience (McCombs et al., 2014). Framing research examines how media frame the textual, verbal, and visual content of stories to assist audiences in organizing the new information within their pre-existing experiences. Research on framing demonstrates the effects of news stories' context and interconnectedness with related issues on audience perceptions (Entman, 1993). For example, the media effects of news reporting on crime and violence have led to the reinforcement of racist stereotypes pertaining to people and places featured in the news story, increased levels of victim blaming, and the undermining of effective public health responses (DeFoster and Swalve, 2018; Guo et al., 2021; Iyengar, 1991; Parham-Payne, 2014). There is evidence that differences between the characteristics of shootings that receive news coverage, as compared to all shootings, obscure the true epidemiology of US firearm violence, which could impact policy decisions and resource allocation to address this public health problem (DeFoster and Swalve, 2018; Guo et al., 2021; Parham-Payne, 2014). Uncovering representational disparities in CFV news reports could help public health practitioners address misinformation about this common form of firearm violence and provide feedback for journalists on ways to improve the accuracy of their reporting on CFV.

To better understand how CFV is communicated to the public and policy makers, we aimed to identify systematic differences between the characteristics of shooting victims and events covered on local television news and all shootings in Philadelphia, PA, a city with escalating CFV incidence (Beard et al., 2021). We were interested specifically in whether there were racial disparities in news reporting on CFV, given that US news has historically presented stereotypical portrayals of Black and Latine crime victims (Dixon, 2017; Parham-Payne, 2014). Media scholarship on US news' racialization of crime and violence has focused predominantly on television newscasts, which led us to select this medium for assessment (Dixon, 2017; Iyengar, 1991). In addition, television news is the modality with the largest reach that also creates original reporting, making it an ideal place to begin investigating this topic (Forman-Katz and Matsa, n.d.). Because structural racism operates in part through place-based disparities in investment and opportunity, we looked specifically at the features of neighborhoods where shootings were more likely to be reported in addition to examining for disparities in reporting by victim level-characteristics (Mehranbod et al., 2022).

2. Methods

This study utilized quantitative content analysis, an approach that identifies trends in media content (Riffe et al., 2019). Using TVEyes, a subscription television monitoring platform, members of our research team previously compiled a database of all news segments about regional and national firearm violence broadcast during three daily newscasts (6:00 AM, 6:00 PM, and 11:00 PM) on the four Philadelphia local television stations (ABC, CBS, FOX, NBC) in 2021 (n = 7,497 clips). For this study, we collected a stratified sample of stories about shootings that occurred in Philadelphia and aired from January-June 2021 from the existing database. Following best sampling practices for quantitative content analysis of television news, we used a random number generator to select two days from each month during the study period for analysis (Riffe et al., 2019). All of the clips collected on the randomly selected 12 days comprise the dataset for our study, including 154 video clips with approximately 3 h of content.

The sample clips were coded to determine geographic and demographic information about the shooting events and individuals shot. Coded variables included victim-level information (number of people injured, fatality, age, race/ethnicity, and gender) along with any information about the shooting location (e.g. street address, neighborhood). Two coders (ST, TW) worked with practice material until they reached Intercoder reliability (ICR) scores of at least.7 using Krippendorf's alpha and Gwet's AC_1. Then they coded the same, overlapping 10 % of the study sample clips, reaching acceptable levels of ICR. Following confirmation of ICR, coders then coded half of the remaining video clips individually.

Next, shooting events in the coded clip data were matched to corresponding shootings in the Philadelphia Police Department (PPD) database on demographics of individuals shot and shooting event locations, identifying 62 unique individuals shot reported on in the 154 clips ("Shooting Victims - OpenDataPhilly," n.d.). Available fields in the PPD database included shooting date and time, victim characteristics (gender, age, race), event location (masked to the city block), and whether the shooting was fatal or non-fatal. Victim-level information from the PPD data was used for this analysis, given that this is currently the most comprehensive epidemiologic data source for CFV (Kaufman et al., 2019). Self-inflicted shootings and information on shooting suspects is not included in the PPD database.

We compared the characteristics of unique individuals depicted in television clips (n = 62) with the overall characteristics of individuals shot in Philadelphia during the study period (n = 1082) using one-sample two-sided t-tests for continuous variables and binomial proportion tests for categorical variables. We chose the comparison group of overall shooting victims and locations to test the null hypothesis that reported shootings were a random sub-group of all shootings. Based on previous research, individuals were considered part of the same mass shooting event if they were shot within 1 h and 100 m of one another (Beard et al., 2019). Characteristics of shooting event locations reported on television were compared to all shootings using 2021 American Community Survey (ACS) 5-year estimates for median household income and the Gini index. We calculated the index of concentration at the extremes (ICE) for racialized economic segregation for shooting event locations covered on television compared to all shooting events (Krieger et al., 2016). The Gini index and ICE are well-established measures for social and economic inequality and structural racism (Chambers et al., 2019; Krieger et al., 2016). Analyses were performed with R. 4.3.1 and ArcGIS Pro 3.0.0. Temple University's institutional review board determined this analysis of publicly available data was not human subjects research.

3. Results

Compared to all individuals shot during the study period, people whose shootings were covered on local television news were younger (25.13 years for reported shootings vs. 29.36 years for all shootings, $p < 0.001$) and more likely to be children (20.97 % for reported shootings vs. 9.43 % for all shootings, $p = 0.007$) (Table 1). Mass shootings were overrepresented on television news compared to their epidemiologic frequency. Individuals shot in mass shootings involving 4 or more victims comprised 27.42 % of television news shooting victims vs. 4.16 % of all shooting victims ($p < 0.001$). The average median household income of shooting locations featured in the clips was $60,302, significantly higher than the average median household income of $41,233 across all shooting locations ($p = 0.002$). Additionally, shootings featured in television news clips occurred in areas with lower rates of income inequality (Gini index of 0.45 for television news shooting locations vs. 0.48 for all shooting locations, $p = 0.001$) and racialized economic segregation (ICE of −0.03 for television news shooting locations vs. −0.09 for all shooting locations, $p = 0.007$) compared to all shooting locations during the study period.

Fig. 1 is a map of the spatial distribution of shooting events covered on television compared to all shooting events. Reported shootings were concentrated in higher-income areas, and some shooting events received

Table 1
Characteristics of Shooting Victims and Shooting Event Locations Covered on Local Television News in Philadelphia, PA Compared to All Shootings, January-June 2021.

	Television News Shootings (n=62)	All Shootings (n=1082)	P-value
Victim Age Mean (SD), [range]	25.13 (8.79), [6-45]	29.36 (11.20), [3-71]	<0.001*
Victim Age, n (%)			
≤14	4 (6.45)	17 (1.57)	0.02*
15-24	29 (46.77)	389 (35.95)	0.09
25-34	19 (30.65)	376 (34.75)	0.59
35-44	9 (14.52)	174 (16.08)	0.86
≥45	1 (1.61)	104 (9.61)	0.03*
Age not provided	0 (0.00)	22 (2.03)	0.64
Victim is a Child, n (%)			
Yes (vs. No)	13 (20.97)	102 (9.43)	0.007
Gender, n (%)			
Female (vs. Male)	9 (14.52)	127 (11.74)	0.43
Race/Ethnicity, n (%)			
Black	54 (87.10)	921 (85.12)	0.86
White	5 (8.06)	67 (6.19)	0.44
Latinx	3 (4.84)	88 (8.13)	0.49
Asian	0 (0.00)	4 (0.37)	>0.999
Unknown	0 (0.00)	2 (0.18)	>0.999
Shooting Fatal, n (%)			
Yes (vs. No)	19 (30.65)	244 (22.55)	0.13
Mass shooting, n (%)			
2 or more individuals shot	33 (53.23)	277 (25.60)	<0.001*
3 or more individuals shot	20 (32.26)	93 (8.60)	<0.001*
4 or more individuals shot	17 (27.42)	45 (4.16)	<0.001*
Characteristics of event shooting locations, mean (SD)[a]			
Median household income (USD)	60302 (34052)	41233 (24639)	0.002*
Gini index	0.45 (0.06)	0.48 (0.07)	0.001*
ICE for racialized economic segregation	-0.03 (0.15)	-0.09 (0.10)	0.007*

*Indicates statistical significance ($p < 0.05$).
[a]Median household income, Percentage Black residents, Percentage Hispanic or Latino residents calculated at the census block group level; Gini index and index of concentration at the extremes (ICE) calculated at the census tract level.
Abbreviations: USD: United States Dollars; SD: Standard Deviation.

coverage in multiple news stories.

4. Discussion

To our knowledge, this is the first media content analysis to examine news coverage of characteristics of shooting victims and shooting event locations. We found that television news outlets in Philadelphia systematically over-reported shootings of children, mass shootings, and shootings that occurred in neighborhoods with higher median household income, less socioeconomic inequality, and lower rates of racialized economic segregation. Journalists' decisions to broadcast stories about shootings of younger victims more frequently than they occur results in framing that can mislead audiences about the demographics of people at greatest risk of CFV (Entman, 1993).

Our findings provide further evidence that media disproportionally focus on sensationalized mass shootings, framing that can affect audience perception of the public health relevance of mass shootings. A recent national survey found that 25 % of respondents believed mass shootings were the leading cause of death from firearm-related injury, when in fact they represent less than 1 % of shooting deaths ("APM Gun Survey, Part Two," n.d.; Beard et al., 2019). Over-reporting of mass shootings likely causes societal harms beyond audience misunderstanding of firearm violence epidemiology (Romer et al., 2003). Communication scholarship indicates that persistent exposure to news or entertainment media cultivates a world view that does not match reality. Heavy television news consumers, for example, are more likely to believe there are higher rates of crime disproportional to real-world figures (Romer et al., 2003). Accordingly, media misrepresentation mass shooting epidemiology exacerbates public feelings of fear incommensurate to reality, increases firearm purchases (which could lead to increased firearm violence), and may facilitate prioritization of policies that are unlikely to prevent CFV like assault weapons bans (DeFoster and Swalve, 2018; Liu and Wiebe, 2019; Romer et al., 2003).

A particularly novel finding of this study is that local television news stations systematically under-reported shootings that occurred in poorer neighborhoods with greater income inequality and racialized economic segregation. These framing choices could lead news audiences and policy makers to underestimate the impact of CFV on structurally marginalized communities, further obscuring the systemic causes for this marginalization (Entman, 1993; McCombs et al., 2014; Mehranbod et al., 2022). A policy implication of over-reporting shootings in wealthier, less segregated areas would be disproportionate resource allocation for CFV prevention to neighborhoods less commonly affected by CFV (Entman, 1993; McCombs et al., 2014). Shifting resources away from the communities most impacted would deepen racial and socioeconomic inequity and could itself be a driver of CFV intensification (Afif et al., 2022; Mehranbod et al., 2022).

This study is limited by our clip sampling technique and descriptive design. Using a sample of news content is standard practice in media content analysis, because coding an entire dataset is infeasible from a human resources standpoint (Riffe et al., 2019). This constraint meant that we were not able to code and then compare every news clip collected from 2021 to the PPD data. We did not observe disparities in racial representation between the news media and police data, a finding that is likely due to the small sample of White victims of CFV and our use of a single measure to assess racial disparities, the race of the shooting victim. Previous communication research in this area has included additional measures on the length of stories and follow-up stories of victims stratified by race, variables which our sampling frame did not allow us to examine. Additionally, our study includes local television news clips broadcast in a single city experiencing a surge in CFV, therefore, it may not be generalizable to other cities, to national television news, or to print, radio, or social media content.

The study findings have important implications for various stakeholders. Health and public health professionals should engage with journalists and experts with lived experience of CFV to advance accurate reporting that supports effective public health responses to the epidemic of CFV. When covering relatively rare shooting events, including mass shootings and shootings of women and children, journalists should emphasize that these shootings are uncommon and provide epidemiologic context when possible. The public and policy makers should be aware of systematic over-reporting of shootings that occur in higher income areas with less racialized economic segregation. Available public health information on shooting event locations should be used to allocate resources for CFV to the most impacted communities.

CRediT authorship contribution statement

Jessica H. Beard: Writing – review & editing, Writing – original draft, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **Raha Raissian:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Leah Roberts:** Writing – review & editing, Writing – original draft, Software, Investigation, Formal analysis, Data curation, Conceptualization. **Laura Partain:** Writing – review & editing, Writing – original draft, Supervision, Resources, Methodology, Data curation, Conceptualization. **Jennifer Midberry:** Writing – review & editing, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **Tia Walker:** Data curation, Conceptualization, Investigation, Methodology, Writing – review & editing. **Shannon Trombley:** Writing – review &

Fig. 1. Local Television News Coverage of Shooting Events in Philadelphia by Median Household Income, January-June 2021.

editing, Methodology, Investigation, Conceptualization, Data curation. **Jim MacMillan:** Writing – review & editing, Project administration, Resources, Supervision, Conceptualization, Data curation, Funding acquisition. **Christopher N. Morrison:** Writing – review & editing, Supervision, Software, Resources, Funding acquisition, Investigation, Methodology, Data curation, Formal analysis.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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