

ORIGINAL ARTICLE

Long gun suicides in the state of Maryland following the firearm safety act of 2013

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Abstract

Objectives: In 2013, the state of Maryland passed the Firearms Safety Act limiting the private sales of handguns, which did not apply to long guns often used for hunting (e.g., rifles and shotguns). This decreased the accessibility of handguns relative to long guns. We assessed the frequency of long gun suicides in the years before and after the policy change during winter season, which encompasses hunting season in Maryland.

Methods: We performed a retrospective analysis on all 4107 well-characterized adult suicides caused by firearms in Maryland from 2003 through 2019. Logistic regression was performed, stratifying by decedent sex, race, and age.

Results: While handgun suicides decreased in the period after 2013's Firearm Safety Act ($p < 0.008$), wintertime long gun suicides increased after 2013 ($p < 0.004$). Caucasian race ($p < 0.006$), male sex ($p < 0.005$), and middle age ($p < 0.001$) were significantly associated with wintertime long gun suicides after 2013.

Conclusion: Our findings suggest that while the 2013 Firearms Safety Act decreased handgun suicides significantly, it did not reduce long gun suicides and there may even have been replacement with long guns during hunting season, when rifles are out and accessible. This association was most prominent among the demographics most likely to hunt (Caucasian, middle-aged, and male).

KEYWORDS

firearms, gun type, lethal means, policy, suicide

INTRODUCTION

Suicide has consistently ranked as the 10th top cause of death in the United States, with rates rising dramatically over the past 20 years, across most demographic groups (CDC WONDER, [n.d.](#); Hedegaard, [2020](#)). Despite being used in fewer than 5% of suicide attempts, firearms are responsible for more than 50% of suicide deaths (Spicer & Miller, [2000](#); Vyrostek et al., [2004](#)), largely due to suicide attempt by firearm having a nearly 90% fatality rate (Conner et al., [2019](#)). It has been shown that the method chosen for suicide is largely driven by immediate

availability (Kölves et al., [2018](#)), and firmer firearm access policies, including mandated background checks and waiting periods, have effectively reduced suicide rates (Anestis et al., [2015](#); Anestis & Anestis, [2015](#); Crifasi et al., [2015](#); Kaufman et al., [2018](#); Loftin et al., [1991](#); Webster et al., [2004](#)). Additionally, most individuals who die by suicide have never attempted suicide before, and those who survive a suicide attempt are unlikely to die by suicide in the future (Cavanagh et al., [2003](#); O'Donnell et al., [1994](#); Seiden, [1978](#)). It follows then, that reducing access to the most lethal methods of suicide attempts is enormously important toward preventing suicide deaths.

It is well known that household firearm ownership is associated with a higher incidence of suicide (Anglemyer et al., 2014; Dahlberg et al., 2004; Kposowa et al., 2016; Se et al., 2018; Shenassa et al., 2004; Wiebe, 2003). Furthermore, states with strong policies that limit firearm access have lower rates of both firearm suicide and total suicide (Anestis et al., 2015; Rudolph et al., 2015), while the repeal of such laws has been associated with increases in suicide rates (Crifasi et al., 2015). In the state of Maryland, the Firearm Safety Act of 2013 targeted handguns, requiring that would be buyers be 21 years or older, and obtain both permits and firearms training on firearm law, safety, and mechanisms and operation before purchasing a handgun in either a private sale or from a licensed dealer (Md. Code Ann., 2013). While the impetus for this bill may have been to curtail violent crime, not suicides, more restrictive policies surrounding the acquisition of certain types of firearms may have a knock-on effect resulting in a higher proportion of suicide deaths occurring with less restricted classes of firearms. Specifically, in the bill there was no licensing requirement, waiting period, or minimum age for private sales of long guns (e.g., rifles and shotguns; Firearm Safety Act of 2013, 2013; Md. Code Ann., 2013). This omission may have important consequences, as research has shown that long guns are used in a significant portion (28.4%) of suicides by firearm in Maryland, amounting to about 70 deaths each year (Nestadt et al., 2020).

Most long guns are owned for the purpose of hunting or related sport shooting (Kravitz-Wirtz et al., 2020). Nationally, the vast majority (97%) of hunters are white, 90% are male, and 62% are 45 years of age or older (Bureau UC, 2022). In Maryland, there are a variety of hunting seasons, but none are as popular as white tail deer hunting season (Maryland Department of Natural Resources, Wildlife and Heritage Service, 2020). In total, 45,000–55,000 hunters participate in deer hunting alone each year in Maryland. The deer season that is open to rifle hunters spans several weekends in late November and early December, with another weekend in January as well as sporadic Sundays throughout the winter season (Maryland Department of Natural Resources, Wildlife and Heritage Service, 2020). The lack of long gun access controls and the increased availability of long guns during hunting seasons may increase the risk of long gun suicides during hunting seasons compared with other times of year (Nestadt et al., 2020). The reasons for this increased availability are likely multifactorial, including an increase in firearms on display and available for purchase at sporting good stores, and in those being taken out of storage to be cleaned and prepared for hunting.

The current research examines the frequency of long gun suicides in Maryland in the years before and after

the passage of the Firearms Safety Act in 2013. We hypothesize that long guns play a more significant role in Maryland's firearm suicides following the new restrictions which successfully restricted handgun access without targeting long gun usage. We further hypothesize that this effect is strongest during hunting season, due to increased long gun usage and accessibility. We also hypothesize that the majority of long gun suicides occur in the demographics that are most likely to hunt, namely White males aged 45 years and older.

METHODS

We obtained a complete database of all 9170 suicides recorded in Maryland from 2003 through 2019 from the OCME-MD. The OCME-MD evaluates all violent, sudden, suspicious, and unexpected deaths; deaths without a physician in attendance; and deaths in a penal institution in the State of Maryland. There were no significant changes in medical examiner investigative or recording procedures during the study period. The years 2020 and 2021 were not included in this analysis due to potential abnormalities in suicide deaths and their evaluations during the COVID-19 pandemic, the passing of long gun access restrictions in 2020, and concern for incompleteness of the data in the most recent year of collection. A board-certified psychiatrist (PSN) reviewed 5% of these cases via police and OCME-MD reports, and then interviewed the chief medical examiner (VW) to confirm agreement with the OCME-MD definitions of suicide. From the OCME-MD records, we extracted age, sex, race/ethnicity (as defined by the OCME-MD), method of suicide, and police narratives.

Study design

The annual long gun hunting season in Maryland falls roughly within the months of winter. In this study, winter season (defined as December 1 through February 29) was used as a proxy for hunting season to (a) account for the annual variation in exact dates of approved hunting, and (b) to acknowledge that individuals are likely to have increased access to long guns throughout the entire winter season. Of the 9170 total suicide deaths recorded for the years 2003–2019, we excluded 3 decedents with missing sex data, 19 with missing age data, and 151 who were of unknown race/ethnicity or who were listed as being from “other” race/ethnicity, to be able to examine and control for the 4 predominant racial/ethnic groups in Maryland (i.e., non-Hispanic White, Black, Hispanic, and Asian). The final sample included 8997 decedents with full data

on age, sex, race/ethnicity, and method of suicide, with less than 2% of the total suicides excluded in this way.

Of the 8997 decedents, we identified a total of 4107 (45.6%) firearm deaths, of which 1189 (29.0%) were by long guns. Year of death was binned as 2003–2013 and 2014–2019 to reflect the periods before and after the Firearms Safety Act was adopted. Age was binned as following: <30, 31–45, 46–60, and 61+ years. The four main racial/ethnic groups were analyzed individually as well as grouped (non-Hispanic Whites vs. other) as non-Hispanic Whites constitutes an overwhelming majority of suicide cases involving firearms.

Statistical analyses

Given that nationally, male sex, middle age, and White race are associated with hunting, analysis specifically investigated the association between the variables of sex, age, and race with long gun suicides, comparing before and after the passage of the FSA in October 2013 (Bureau UC, 2022). Using long gun suicide deaths as the numerator and total suicide deaths as the denominator, we compared the frequency of long gun suicides across sex, race/ethnicity, age groups, year (binned as 2003–2013 and 2014–2019 to compare between periods before and after the passage of the FSA), and seasons (winter = December–February, spring = March–May, summer = June–August, and fall = September–November). We ran multi-variable regressions with sex, race/ethnicity, and age, as these were found to be associated with long gun suicides in unadjusted analyses. We conducted all analyses with Stata version 16.0 (StataCorp LP).

In addition to multi-variable regressions, we also tested interaction terms between each of the independent variables (age, sex, race/ethnicity) to assess whether the association of winter season with long gun suicide is limited to or more pronounced in specific population groups.

Finally, we reran our analyses using three time periods (2003–2007, 2008–2013, and 2014–2019) to examine discrete differences in earlier years previous to the FSA of 2013.

This study was approved by the Johns Hopkins School of Medicine institutional review board.

RESULTS

The characteristics of suicide decedents in Maryland from 2003–2019 are presented in Table 1. 79% of suicide decedents were male, 79% were non-Hispanic White, and 55% belonged to the two middle age groups (31–60 years). Compared with the overall suicide decedent population,

which included victims who died by other methods, firearm suicides were more frequent in males (51.5% vs. 23.1% in women, $p < 0.001$) and White individuals (48.1% vs. 36.7% across all other racial groups combined, $p < 0.001$).

Suicides using long guns were also associated with male gender and White race. Long gun suicides comprised 15.7% of suicides in men (vs. 3.6% in women; $p < 0.001$) and 15.1% of in Whites (vs. 6.2% across all other racial groups combined). However, in the 61+ age group, while total firearm deaths constituted 62.7% of all suicides (vs. 40.6% across other age groups, $p < 0.001$), long gun suicides made up only 21.8% of these deaths (vs. 32.2% across other age groups, $p < 0.001$).

Long gun suicides constituted a significantly higher proportion of all deaths in winter season than in other seasons (14.6% in winter vs. 12.8% for all other seasons combined, $p = 0.03$), and winter was associated with long gun suicide in unadjusted analysis (odds ratio [OR] = 1.16, $p = 0.037$, 95% confidence interval [CI] = 1.01, 1.34). Compared with the 2003–2013 period, there were fewer overall firearm suicides in 2014–2019 (OR = 0.89, $p = 0.009$, 95% CI = 0.82, 0.97). Unadjusted analysis showed that year-round frequency of long gun suicides did not change significantly after 2013 (OR = 0.98, $p = 0.798$, 95% CI = 0.87, 1.12). However, stratification by season showed that in winter, long gun suicides increased in 2014–2019 compared with 2003–2013 (OR = 1.390, $p = 0.005$, 95% CI = 1.10, 1.75). This observation held for adjusted analysis controlling for sex, race, and age (OR = 1.39, $p = 0.006$, 95% CI = 1.10, 1.75). In contrast, year-round suicides by handgun were lower in 2014–2019 than in 2003–2013 ($p = 0.008$), which held in adjusted analysis (OR = 0.87, $p = 0.003$, 95% CI = 0.79–0.95).

In adjusted analysis, stratifying by sex demonstrated a significant association between winter season and long gun suicides for men in 2014–2019 (OR = 1.40, $p = 0.006$, 95% CI = 1.10, 1.78) but not in 2003–2013 (OR = 1.06, $p = 0.556$, 95% CI = 0.88, 1.28; Figure 1). However, for women, neither period showed a significant association between winter season and long gun suicide (2003–2013: OR = 1.02, $p = 0.958$, 95% CI = 0.49, 2.11; 2014–2019: OR = 1.15, $p = 0.77$, 95% CI = 0.45, 2.98).

Stratification by age showed that in 2014–2019, winter season was associated with long gun suicide in the 31–45 group (OR = 2.00, $p = 0.006$, 95% CI = 1.21, 3.29) and marginally for the 46–60+ age group (OR = 1.49, $p = 0.058$, 95% CI = 0.99, 2.24) but not in the youngest (<30) nor oldest (61+) groups (Figure 2). For the years 2003–2013, none of the age groups exhibited an association between winter season and long gun suicide.

Stratification by race showed an association between winter season and long gun suicide in non-Hispanic Whites for the 2014–2019 period (OR: 1.42, $p = 0.006$, 95%

TABLE 1 Demographic characteristics of firearm suicide decedents in Maryland, 2003–2019

Characteristic	Total suicides	Firearm suicides	Long gun suicides	Firearm/total (%)	χ^2	p-Value	Long gun/total (%)	χ^2	p-Value	Long gun/firearm (%)	χ^2	p-Value
Sex												
Male	7143	3679	1123	51.5%			15.7%			30.5%		
Female	1854	428	66	23.1%	476.5	p < 0.001	3.6%	189.8	p < 0.001	15.4%	42.5	p < 0.001
Race/Ethnicity												
Non-Hispanic White	7073	3401	1070	48.1%			15.1%			31.5%		
Non-Hispanic Black	1456	618	99	42.5%			6.8%			16.0%		
Hispanic	230	50	9	21.7%			3.9%			18.0%		
Asian	238	38	11	16.0%	157.9	p < 0.001	4.6%	107.5	p < 0.001	29.0%	63.6	p < 0.001
Age, years												
<30	2021	762	260	37.7%			12.9%			34.1%		
31–45	2184	859	261	39.3%			12.0%			30.4%		
46–60	2742	1200	388	43.8%			14.2%			32.3%		
61+	2050	1286	280	62.7%	334.8	p < 0.001	13.7%	5.7	p = 0.13	21.8%	49.7	p < 0.001
Year of death												
2003–13	5683	2651	755	46.7%			13.3%			28.5%		
2014–19	3314	1456	434	43.9%	6.91	p = 0.01	13.1%	0.07	p = 0.80	29.8%	0.81	p = 0.37
Season of death												
Winter (December–February)	2108	1003	307	47.6%			14.6%			30.6%		
Spring (March–May)	2290	1043	306	45.5%			13.4%			29.3%		
Summer (June–August)	2324	1051	314	45.2%			13.5%			29.9%		
Fall (September–December)	2275	1010	262	44.4%	4.34	p = 0.23	11.5%	9.29	p = 0.03	25.9%	6.30	p = 0.10

The bold represents significant values, $p < 0.05$.

FIGURE 1 Odds ratios (OR) for wintertime long gun suicide in men versus women, 2003–2019. The results are presented separately for men and women, adjusted for age and race/ethnicity. *The OR was significantly different at $p < 0.05$

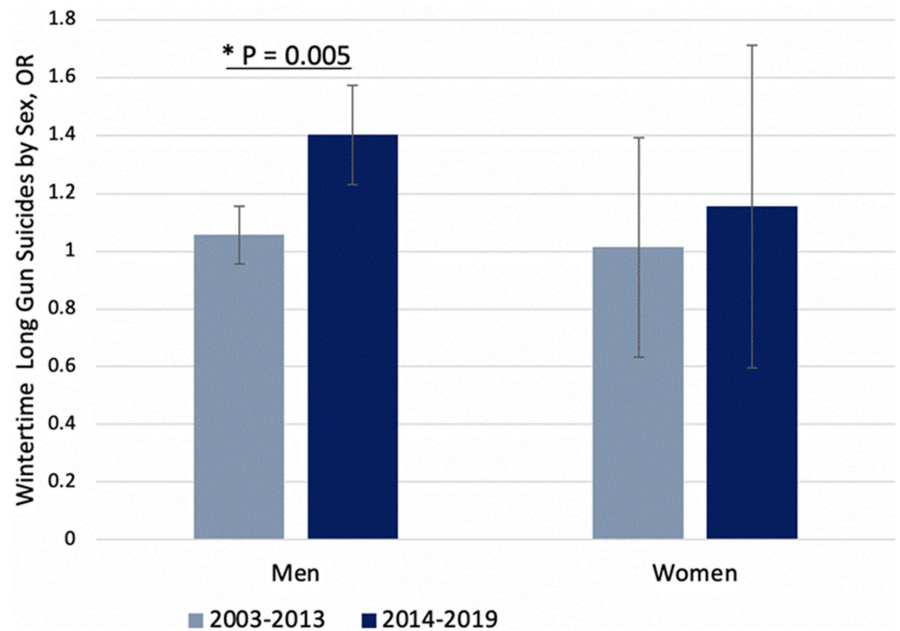
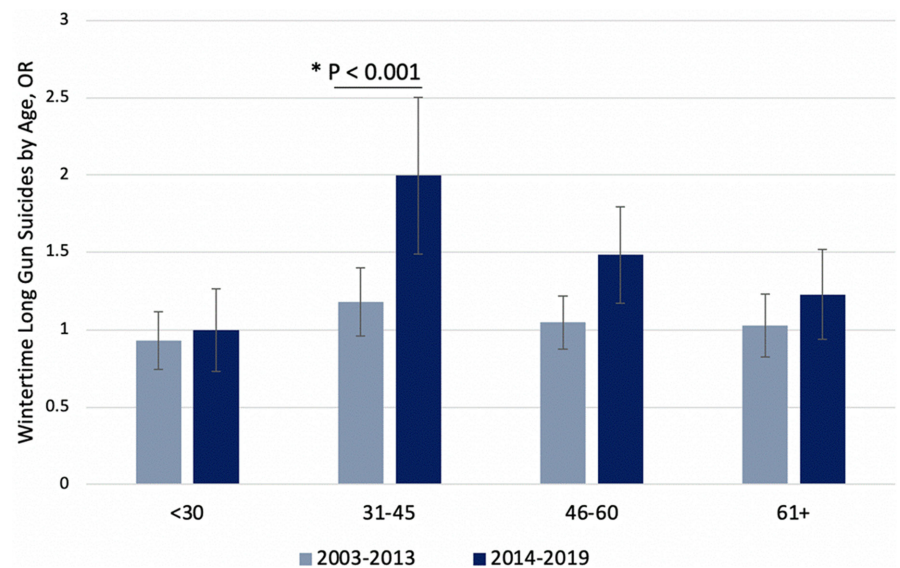


FIGURE 2 Odds ratios (OR) for wintertime long gun suicide by age, 2003–2019. The results are presented separately for the following age groups: <30, 31–45, 46–60, and 61+ years, adjusted for sex and race/ethnicity. *The OR was significantly different at $p < 0.05$



CI = 1.10, 1.82; Figure 3). This was not observed in other racial groups (Black, Hispanic, and Asian). For the years 2003–2013, no racial/ethnic group saw a significant association between winter season and long gun suicide.

To summarize, upon stratifying by age, sex, and race, we found that the Caucasian race, male sex, and middle age (31–45 years) were significant drivers of wintertime long gun suicides after 2013.

In the interaction analysis, we found a significant interaction between gender and age, when adjusted for race, in driving long gun suicides in the winter. Specifically, older age was associated with wintertime suicide by long gun in men but not women (age 46–60: OR = 2.14, $p = 0.024$, 95% CI = 1.10, 4.14; age 61+: OR = 0.27, $p = 0.007$, 95% CI = 1.42, 9.52). There were no statistically significant interactions between age and race/ethnicity, or between race/ethnicity and sex.

A secondary analysis was attempted using three distinct time periods (2003–2007, 2008–2013, and 2014–2019) instead of a binary representing the pre- and post-FSA years (2003–2013 and 2014–2019). We compared these three time periods using multivariate analyses adjusting for age, sex, and race. Results were similar to the original analysis of two time periods. Again, there were significant increases in winter season long gun suicides the 2014–2019 (post-FSA) period compared to the earliest period but no significant associations between the two pre-FSA periods, or between the middle and final period.

DISCUSSION

We found that there was a statistically significant decrease in handgun suicides in the years immediately following

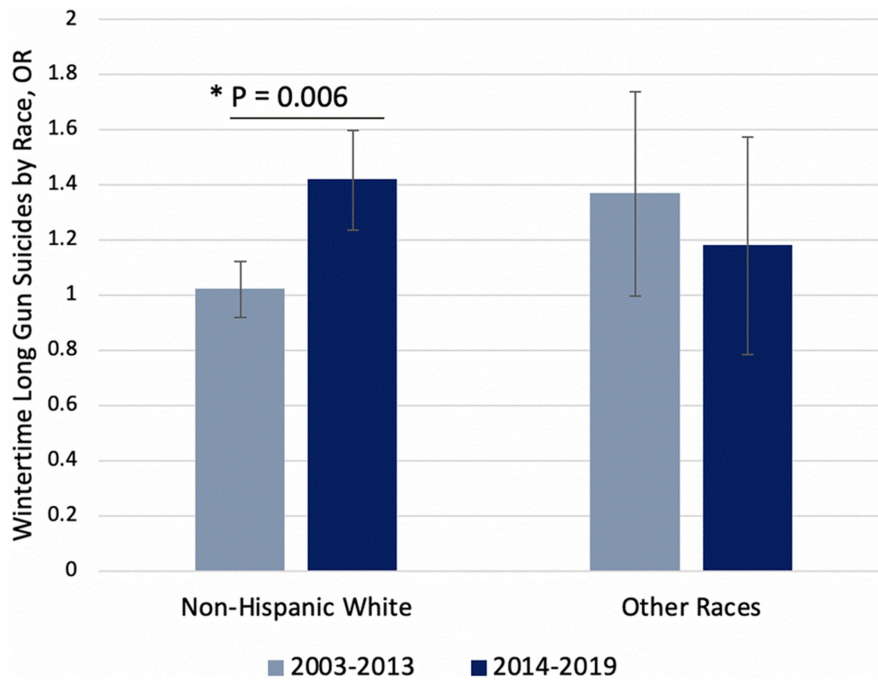


FIGURE 3 Odds ratios (OR) for wintertime long gun suicide by race/ethnicity, 2003–2019. The results are presented separately for Non-Hispanic Whites and other races (encompassing Black, Hispanic, and Asian). *The OR was significantly different at $p < 0.05$

the passage of the FSA in 2013. The incidence of long gun suicides did not decrease during this period and in fact actually increased during the winter months. This was found to be the case when comparing years before and after the passage of the FSA in 2013, as well as when comparing only the earliest years of data to the years following the FSA. It bears repeating that the FSA introduced new restrictions that made it more difficult to acquire handguns, but did not significantly change the requirements for one to acquire a long gun.

The decreased frequency of handgun suicides since 2013 may be related to the gun laws passed in Maryland. This trend is consistent with past evidence suggesting that firmer firearm access policies, including mandated background checks and waiting periods, effectively reduced suicide rates (Anestis et al., 2015; Anestis & Anestis, 2015; Crifasi et al., 2015; Kaufman et al., 2018; Loftin et al., 1991; Webster et al., 2004). As mentioned above, the FSA requires licensing and a waiting period for handguns only, while long guns are exempt from these measures. It stands to reason then that people who prior to these laws may have had easier access to handguns, might be limited to long guns, increasing the risk of long gun suicide, particularly around hunting season. Thus, although overall suicides by firearms decreased after 2013, our data suggest the legislation missed the opportunity to reduce even more deaths by placing limitations on long gun access.

The hypothesized effect of the new gun laws in shifting gun suicides from the use of handguns to long guns does not directly explain the racial or sex differences in choice of gun type in suicide. One explanation is that White, non-Hispanic males are most likely to engage in recreational

hunting (Bureau UC, 2022). Hunters are more likely to own long guns, and therefore be more likely to have them on hand and available to use during a suicide attempt. These weapons would be readily accessible during the winter season, when firearms are out of storage for hunting weekends, trips, maintenance, and after new seasonal purchases. Hunters would be more likely to have their firearms cleaned and have ammunition stocked, making an impulsive attempt easier to carry out. These weapons may also be more prominently displayed at sporting goods stores, which could make an impulsive purchase more likely in someone who otherwise would not have purchased a firearm.

Accessibility and familiarity with firearms represent critical elements in determining the choice of suicide method; firearm licensees are more likely to use firearms for suicide than non-licensees (Klieve et al., 2009). Opponents of policies which limit access to firearms have argued that restricting access to guns would serve only to push individuals with suicidal intent to choose other methods of suicide. However, previous studies have associated stringent firearm laws with decreased firearm-related suicide with little or no increase in non-firearm-related suicide (Klieve et al., 2009; Saadi et al., 2020). Thus, it stands to reason that restricting long gun access and requiring licensure for long guns, in the same way handguns are regulated, would prevent long gun suicides with minimal unintended risk.

Our data are notable for several trends with regard to gun types and suicide. First, among the group with the highest frequency of suicide: White, non-Hispanic men, firearms are overrepresented as the method of

suicide, consistent with an earlier national study (Hanlon et al., 2019). Second, this trend is even more pronounced when examining only long gun suicides. Third, long gun suicides are significantly higher during winter season, albeit only by slim proportion (accounting for 14.6% of all deaths in winter as opposed to 12.8% across the other seasons). Fourth, since 2013, handgun suicides have decreased, while wintertime suicides using long guns have increased. This is consistent with previous findings, where we found that during hunting season, groups most likely to hunt (White males) died using hunting rifles (Nestadt et al., 2017). These findings are clinically useful in the evaluation of individuals at risk for suicide. Demographic characteristics of evaluatees are routinely considered when performing suicide risk assessments, and more robust knowledge of the specific dangers to this demographic group will allow for more accurate screening by evaluators.

Among decedents in the 61+ age group, long gun suicides accounted for a notably smaller percentage of overall suicides by firearm than all other age groups. Long gun suicides in this population increased after 2013, but not significantly so. A possible explanation for the lower rate of long gun suicides as a proportion of firearm suicides is that individuals tend to hunt less in old age, possibly as a result of declining physical health. The 2016 National Survey of Fishing, Hunting, & Wildlife Associate Recreation shows that only 14.1% of individuals over the age of 65 in the United States hunt, compared to 24% of 55–64-year-olds, and 22% of 45–54-year-olds (Bureau UC, 2022). Maryland-specific data were not available. Despite this lower rate of long gun suicides, firearms were the cause of death of 62.7% of suicide decedents aged 61 and over in our study which is significantly higher ($p < 0.001$) than for other age groups (40.6%). This rate is broadly consistent with data from WISQARS which finds that up to 70% of suicides among older adults involve the use of a firearm (WISQARS [Web-based Injury Statistics Query and Reporting System], 2021). This statistic in combination with the aging population of the United States means that the absolute number of firearm suicides among older adults will increase greatly in coming years (Rosen et al., 2019). Compounding this concern are the facts that the number of Americans living with Alzheimer's disease or other dementias is projected to increase from 4.7 million individuals in 2010 to 13.8 million individuals in 2050, and that firearms are already the leading method of suicide among individuals with dementia (Betz et al., 2018; Polzer et al., 2021). These findings also have clinical significance. Clinicians routinely perform education with the family members of people who have been newly diagnosed with dementia, for example, how to reduce wandering behaviors or limit access to motor vehicles when driving is no longer appropriate. Adding

questions to these screens about access to firearms, and ensuring that any firearms are either removed from the home, or safely stored, would allow clinicians to better ensure that individuals with dementia, and their families, can be kept safe.

There were several strengths to our study. Maryland is an excellent setting for the examination of suicide mortality because the state utilizes a uniform statewide medical examiner system. The Chief Medical Examiner for the State of Maryland (OCME-MD) was the first statewide medical examiner system established in the country and continues to lead the field in protocolized, systematic death investigations of all unnatural deaths in the state. These include full autopsy and toxicology reports on all deaths as well as electronic documentation and transcription of related police reports. The OCME maintains a data use agreement with local public health researchers which allows for unique access to decedent data and patterns of suicide in the state (Bray et al., 2021; Nestadt et al., 2017, 2020). As far as we are aware, the use of primary data from the state medical examiner for the purpose of detailing and confirming firearm type is unprecedented. These data are more current, complete, and consistently collected than national data sources derived from a mixture of coroner and medical examiner systems across the country (Blair et al., 2016; Hanzlick, 2006). In addition to the use of primary data, the state medical examiner also participated in interviews and manuscript review to ensure accurate characterization of the cases involved. Our data set comprises all firearm suicide deaths in the state of Maryland, which affords us a more thorough view of firearm suicide across the entire state than if only a sample had been available.

Limitations to our study are as follows. Our data were limited to one state and may not be generalizable to other states with differing restrictions for long gun usage and access. Additionally, although we hypothesize that the timing of the 2013 Firearm Safety Act was partially responsible for the increase in long gun suicides, we do not have data regarding when the firearms in each suicide case were purchased; it is thus not possible to characterize a direct relationship between the laws and firearm access. There is also the possibility of firearms being purchased from neighboring states, especially those with more permissive laws surrounding firearm access. It is thus challenging to measure the direct impact of policy on the incidence of firearm suicide. Finally, our study analyzed data from before the start of the COVID-19 pandemic, during which there have been increasing amounts of new gun owners, with a higher proportion of those new gun owners belonging to demographic groups that traditionally have lower rates of gun ownership (Crifasi et al., 2021; Firearm Purchasing During the COVID-19 Pandemic: Results

From the 2021 National Firearms Survey – PubMed, 2022). New gun owners during the COVID era are more likely to be female, black, or Hispanic (Firearm Purchasing During the COVID-19 Pandemic: Results From the 2021 National Firearms Survey – PubMed, 2022). Individuals who intended to purchase guns during the early stages of the COVID-19 pandemic (March–June 2020) were more likely than non-purchasers to have experienced suicide ideation during their lifetime, the past year, and the past month prior to intended purchase (Anestis & Bryan, 2021).

Further limitations include the use of absolute numbers rather than calculated rates for ease of reader interpretation and to avoid overstating findings where small numbers are concerned; however, this was done knowing that the total population of Maryland did not change meaningfully throughout the study period (United States Census Bureau, 2022). Furthermore, due annual variation in dates approved for hunting season, and incomplete public data for the years being studied, winter season was used as a proxy for hunting season.

These findings provide insight into potential dangers of long guns, but future studies might investigate the ways in which long guns were accessed leading to a suicide, including whether they tend to be purchased soon before use, or if they were previously owned or even family heirlooms. Patterns of safe storage should be investigated, as long guns may lend themselves to different forms of storage or be more likely to be on display than other firearms, and hence accessible to those at risk. Future investigation into the impact of changes in firearm policies that bring long gun restrictions in line with those of handguns may help to reduce the burden of long gun suicide. Additionally, future investigation of the clinician role in screening for gun possession and making recommendations for safe storage practices may yield valuable insight in the development of effective suicide prevention mechanisms, particularly during hunting season, and particularly for at-risk populations.

CONCLUSION

These findings support the potential for state policy to mediate change in the frequency of firearm suicides, as well as the importance of assuring that these policies are comprehensive and not limited to specific gun types. These findings also underscore expanding role of long guns in contributing to firearm suicides, particularly in the demographic most likely to hunt (White, middle-aged men). It is important to involve communities, law enforcement, clinicians, and other key stakeholders in initiatives to prevent death and injury by firearm in higher-risk populations. Initiatives from organizations

such as the Gun Shop Project and *National Shooting Sports Association* have successfully advocated for awareness and prevention of firearm-related suicides. Along a similar vein, hunting communities could be engaged to more specifically target and prevent long gun suicides.

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CONFLICT OF INTEREST

None.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the Office of the Chief Medical Examiner of Maryland. Restrictions apply to the availability of these data, which were used under license for this study. Data are available from the authors pending the permission of the Office of the Chief Medical Examiner of Maryland.

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