Background & Purpose

An estimated 30% of all U.S. households, and 46% of rural households, contain at least one firearm. In 2017, nearly 40,000 persons died of firearm injuries in the U.S. The majority of firearm deaths are due to suicide, with homicide as the second factor and accidental injury as the last. Safe gun storage can reduce the risks of accidental injury and self harm, but many gun owners do not take these steps.

We estimated the prevalence of gun ownership and safe storage practices among adults in three states, examining by residence, presence of a vulnerable individual in the home, and reported risky behavior.

Figure 1. Gun ownership among adults in the US, 2015

PERCENT WHO OWN GUNS

Methods

Data source: 2017 BRFSS public use data for states that included the Firearms Module (Idaho, Oregon & Texas; n = 22,519)

Studies population: those who answered firearm questions and for whom demographic and health information was present (15,802).

Definitions:

Gun ownership: one or more firearms kept in or around the home, with garages, storage areas and motor vehicles included as “home.”

Safe storage: no loaded weapons in the house OR any loaded weapons locked.

Residence was measured by BRFSS at the county level and reported as metropolitan (urban, n = 6,185), nonmetropolitan (rural, n = 1,720), and suppressed (n=7,944).

Vulnerable household: presence of a child or of an adult with depression or poor mental health

Risky behavior: inconsistent seat belt use, smoking, or binge drinking.

Analysis: Conducted in STATA, accounting for weighting. Differences between the groups tested using Wald Chi Square tests.

Results

Rural residents were more likely to own a firearm than urban or other adults (Figure 2). Within gun owners, rural residents were less likely to report unsafe storage (12.2% of rural, 14.7% of urban, 19.6% of suppressed; p = 0.0319).

Within all respondents, presence of a vulnerable individual in the home (child, adult reporting depression, adult reporting poor mental health) was not associated with unsafe firearm storage. Within all respondents, adults who reported inconsistent seat belt use and those who reported moderate to binge drinking were more likely to report unsafe firearm storage than their counterparts. Smoking was not statistically associated with firearm storage.

Because data suppression leads to small cell sizes, it was not possible to analyze vulnerability or risk factors for unsafe gun storage within rural populations alone.

Table 1. Association of risk behaviors with firearm storage, 3 states, 2017 BRFSS

<table>
<thead>
<tr>
<th>Risk Behavior</th>
<th>No gun in home</th>
<th>Gun, safely stored</th>
<th>Gun, unsafely stored</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
</tr>
<tr>
<td>Inconsistent</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
</tr>
<tr>
<td>Current smoker</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
</tr>
<tr>
<td>No alcohol</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
</tr>
<tr>
<td>Moderate use of alcohol</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
</tr>
<tr>
<td>Binge drinking</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
<td>0.60%</td>
</tr>
</tbody>
</table>


differences associated with mental health status significant at p = 0.0043

Discussion

Rural residents were not more likely to report access to loaded, unlocked firearms than were other adults, and among gun owners, were less likely to report unsafe storage.

Previous research has noted that risky behaviors associated with disparities in other spheres (e.g., binge drinking) are associated with unsafe gun storage. However, we did not find that unsafe behaviors were associated with unsafe gun storage after adjusting for personal characteristics.

Unlike prior work, we did not find that presence of a child in the home was associated with safer gun storage.

Data suppression makes it nearly impossible for researchers to examine risk factors for inappropriate gun storage among rural populations. The Centers for Disease Control and Prevention should consider techniques and strategies for making research data available, at least the rural/urban dichotomy, more accessible for public health research.

References

8. Janice C. Probst, PhD * Jan M. Eberth, PhD * Kevin Bennett, PhD | Elizabeth Crouch, PhD
9. 3Rural and Minority Health Research Center, University of South Carolina Arnold School of Public Health;
10. 3CSC Center for Rural and Primary Healthcare; University of South Carolina School of Medicine

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