

GUN VIOLENCE AND LGBT ADULTS

Findings from the General Social Survey and the
Cooperative Congressional Election Survey

Kerith J. Conron
Shoshana K. Goldberg
Andrew R. Flores
Winston Luhur
Wynn Tashman
Adam P. Romero

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FOR MORE INFORMATION

The Williams Institute, UCLA School of Law, Box 951476 Los Angeles, CA 90095-1476(310) 267-4382 | williamsinstitute@law.ucla.edu | williamsinstitute.law.ucla.edu

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OVERVIEW

Gun violence is a major cause of preventable mortality; each year, gun violence accounts for 68% of US homicides¹ and exacts an economic toll of over \$229 billion.² The presence of guns is associated with increased risk of death,³ largely because acts of violence, self- or other- directed, are lethal when a gun is used.⁴ Violence is a significant problem for lesbian, gay, bisexual, and transgender (LGBT) people;⁵ however, the extent to which guns contribute to LGBT morbidity and mortality is currently unknown.

Suicide attempts, intimate partner violence (IPV), and other forms of inter-personal violence occur at comparable or higher rates among LGBT people relative to the general population. Lifetime suicide attempts are two to four times more common among LGB youth⁶ and adults⁷ than among heterosexuals, and are over five⁸ to eight⁹ times more common among transgender adults than the general population.¹⁰ In fact, according to the largest survey of transgender and gender non-conforming adults to date, over 40% of respondents made at least one lifetime suicide attempt¹¹ Nearly one out of four LGB adults has experienced physical and/or sexual victimization by an intimate partner – similar to non-LGB adults.¹² IPV is more common among transgender¹³ than cisgender adults and among bisexual compared to heterosexual women¹⁴ – particularly in the context of male-female relationships.¹⁵ Moreover, disproportionate exposure to school-based bullying,¹⁶ including being threatened with weapons at school, has been widely documented among LGBT youth, impacting their mental health now,¹⁷ and in the future,¹⁸ by increasing the likelihood of school drop-out¹⁹ and poverty.²⁰

In 1990, the Hate Crimes Statistics Act²¹ mandated federal collection of data on hate crimes based on sexual orientation, race, ethnicity, and religion. Following the 2009 Matthew Shepard and James Byrd Hate Crimes Prevention Act, this mandate was expanded to include hate crimes based on gender and gender identity. The FBI's Uniform Crime Reports (UCR) Program²² manages this data collection and reports on hate crimes based on anti-gay and anti-transgender bias. In 2016, the Bureau of Justice Statistics began collecting sexual orientation and gender identity information, among other demographics, from respondents to the National Crime Victimization Survey (NCVS).²³ In 2016, 17.9% of reported hate crimes were attributed to anti-LGBT bias,²⁴ whereas LGBT people were only 4.5% of the population.²⁵ Many anti-LGBT hate crimes entail a weapon;²⁶ however, the UCR does not specify whether the weapon was a gun.

Information about the extent to which guns have been used against and by LGBT people is currently lacking. Indeed, information about sexual orientation and gender identity is not collected on death certificates,²⁷ nor in most public systems and registries that track injury. These gaps inhibit knowledge about the extent and characteristics of gun violence experienced by LGBT people and inhibit efforts to integrate LGBT people in gun prevention efforts. This study aims to fill gaps in knowledge about LGBT gun violence by: 1) generating estimates of gun ownership and attitudes towards gun control by sexual orientation, and, 2) identifying opportunities to improve data collection about LGBT gun violence through a review of surveillance systems used to track gun violence.



METHODS

A. STUDY DESIGN AND SAMPLES

Analyses of data collected from two cross-sectional surveys, the General Social Survey, and the Cooperative Congressional Election Survey, were conducted to examine gun ownership and attitudes towards gun control policies by sexual orientation. The General Social Survey (GSS)²⁸ is a nationally-representative survey of adults conducted annually to monitor American social characteristics and attitudes. Data from the 2008-2016 surveys were aggregated to have a sufficient number of lesbian, gay, and bisexual respondents in the analytic sample. Respondents who answered (versus skipped) questions about sexual orientation identity (N=5,893; LGB n=240; heterosexual n=5,653) were included in the analysis.

The Cooperative Congressional Election Survey (CCES)²⁹ is an on-line, attitudinal survey of US adults conducted with a sample of empaneled YouGov members and then weighted to reflect the larger US adult population.³⁰ Data from 2016 Cooperative Congressional Election Survey respondents who reported a lesbian, gay, bisexual, or heterosexual sexual orientation identity were included in the analysis (N=55,121, LGB n=4,179; heterosexual n=50,942.)

B. MEASURES AND ANALYSES

Please refer to Appendix A for information about measures of sexual orientation, sex, race-ethnicity, and gun ownership and attitudes used in this report. Bivariate cross-tabs of gun ownership by sexual orientation (overall, and sex- and race- stratified), and adjusted logistic regression of the association between gun ownership and sexual orientation were conducted with the GSS 1972-2016 Cumulative Datafile using the on-line University of California at Berkeley Survey Documentation and Analysis program.³¹ Logistic regression models of the association between sexual orientation (LGB/heterosexual [referent]) and gun in the home (yes/all other options [referent]), gun ownership, and attitudes towards gun permit laws were fit, adjusting for sex, race-ethnicity, age, and Census region (Table A.2.a; Table A.2.b). In addition, sex-stratified (Table A.2.c), and race-ethnicity (non-Hispanic White [referent]/Hispanic, Black, or "Other") stratified (Table A.2.d) models were fit for the association between sexual orientation and gun ownership. For all models, logit Betas and Standard Errors, plus Odds Ratios/95% Confidence Intervals, were computed. GSS analyses were weighted using GSS composite sampling weights.

For CCES variables, bivariate cross tabs and logistic regression analyses of the association between attitude and sexual orientation (adjusting for age, sex, and race, and incorporating state-level fixed effects) were conducted using Stata software and weighted using the CCES variable `commonweight_vv_lgbt`.



FINDINGS

A. PREVALENCE OF GUNS IN THE HOUSE BY SEXUAL ORIENTATION

LGB respondents were significantly less likely than heterosexuals to report having a gun in their home (18.8% versus 35.1% as shown in Table 1 below; odds ratio [OR]=0.47, 95% confidence interval [CI]=0.32, 0.69; Appendix 2, Table A2a.) Applying these proportions to Census population projections, this translates to an estimated 1,943,000 LGB adults (95% CI=1,406,000, 2,626,000) and 84,846,000 (95% CI=76,144,000, 94,273,000) heterosexual/straight adults with guns in their homes across the U.S. Of those (LGB and non-LGB) who have a gun in the house, 61.2%, on average, reported that it was their own gun (results not shown). Among respondents with guns in the house, LGB and heterosexual/straight respondents did not differ on whether guns belonged to them (prevalence LGB 64.7%, heterosexual/straight 61.1%, results not shown; multivariable analyses in Appendix 2, Table A2c.)

Table 1. Presence of guns in the home (weighted proportion and estimated population count), by sexual orientation, among adult respondents to the 2008-2016 General Social Survey

| | LGB | | | | Heterosexual/Straight | | | |
|--------------|-------------------------|-------------|--|---------------|---------------------------|-------------|--------------------------------|-------------------|
| | Weighted %, GSS (n=240) | | Estimated count, ³² US (in 1,000) | | Weighted %, GSS (n=5,653) | | Estimated count, US (in 1,000) | |
| | % | 95% CI | N | 95% CI | % | 95% CI | N | 95% CI |
| Yes | 18.8 | 13.6 – 25.4 | 1,943 | 1,406 – 2,626 | 35.1 | 35.5 – 39.0 | 84,846 | 76,144 – 94,273 |
| No | 79.9 | 73.2 – 85.2 | 8,260 | 7,567 – 8,808 | 62.5 | 58.5 – 66.4 | 151,079 | 141,410 – 160,506 |
| Refused | 1.3 | 0.4 – 4.1 | 134 | 41 – 424 | 2.3 | 1.9 – 2.9 | 5,560 | 4,593 – 7,010 |
| F [df1, df2] | | | | | 11.9 [2,308]* | | | |

CI: Confidence Interval; LGB: Lesbian, Gay, Bisexual; GSS: General Social Survey; df1 = numerator degrees of freedom; df2 = denominator degrees of freedom; *significant association between sexual orientation and gun ownership at p<0.01

B. SEXUAL ORIENTATION DIFFERENCES IN PREVALENCE OF GUNS IN THE HOME, BY DEMOGRAPHIC CHARACTERISTICS

LGB respondents were less likely to have guns in the home than their heterosexual peers, whether they were males or females (Table 2). In multivariable analyses that adjust for differences in the age, race, and regional distribution of each sexual orientation group, GB males were less likely to have guns (OR=0.32, 95% CI=0.17, 0.60) than heterosexual males, while sexual orientation differences among females were no

longer statistically significant (Appendix 2, Table A2c.) Among LGB respondents, comparable percentages of males (17.3%) and females (19.9%) reported having guns in their home (Table 2). In contrast, among heterosexuals, a larger percentage of males than females (40.2% versus 30.8%, respectively) reported having a gun in their home.

LGB respondents were less likely to own guns than heterosexuals, both among Non-Hispanic Whites (OR=0.49; 95% CI=0.31, 0.76) and among respondents of all other race/ethnicities (OR=0.39; 95% CI=0.17, 0.90) (Appendix 2, Table A2d). Non-Hispanic Whites were more likely to have a gun in their home than respondents of other race-ethnicities, across sexual orientation groups (Table 3). Heterosexual/straight non-Hispanic Whites were the mostly likely and LGB people of color were the least likely to have a gun in the home (44.2% versus 6.9%, respectively.)

Table 2. Presence of guns in the home (weighted proportion and unadjusted bivariate associations), by sexual orientation and sex, among adult respondents to the 2008-2016 General Social Survey

| | Males | | | | Females | | | |
|---------------------|---------------|-------------|------------------------------------|-------------|-----------------|-------------|------------------------------------|-------------|
| | GB (n=111) | | Heterosexual/Straight (n=2,557) | | LB (n=5,653) | | Heterosexual/Straight (n=3,096) | |
| | % | 95% CI | % | 95% CI | % | 95% CI | % | 95% CI |
| Yes | 17.3 | 10.0 – 28.2 | 40.2 | 35.8 – 44.8 | 19.9 | 13.1 – 29.1 | 30.8 | 27.2 – 34.6 |
| No | 79.6 | 69.1 – 87.1 | 56.9 | 52.2 – 61.5 | 80.1 | 70.9 – 86.9 | 67.3 | 63.3 – 71.0 |
| Refused | 3.1 | 1.0 – 9.0 | 2.9 | 2.1 – 3.8 | 0 | -- | 1.9 | 1.4 – 2.5 |
| <i>F</i> [df1, df2] | 9.1 [2, 308]* | | | | 7.4 [2, 308]* | | | |

CI: Confidence Interval; LGB: Lesbian, Gay, Bisexual; GSS: General Social Survey; df1 = numerator degrees of freedom; df2 = denominator degrees of freedom; *significant association between sexual orientation and gun ownership at $p < 0.01$

Table 3. Presence of guns in the home (weighted proportion and unadjusted bivariate associations), by sexual orientation and race/ethnicity, among adult respondents to the 2008-2016 General Social Survey

| | Non-Hispanic White | | | | All Other Race/Ethnicities | | | |
|---------------------|--------------------|-------------|------------------------------------|-------------|----------------------------|-------------|------------------------------------|-------------|
| | LGB (n=157) | | Heterosexual/Straight (n=3,877) | | LB (n=83) | | Heterosexual/Straight (n=1,776) | |
| | % | 95% CI | % | 95% CI | % | 95% CI | % | 95% CI |
| Yes | 24.9 | 17.5 – 34.0 | 44.2 | 40.5 – 47.9 | 6.9 | 3.5 – 13.4 | 16.6 | 13.7 – 19.9 |
| No | 73.1 | 63.7 – 80.9 | 53.2 | 49.3 – 57.1 | 93.1 | 86.6 – 96.5 | 81.6 | 78.1 – 84.6 |
| Refused | 2.0 | 0.6 – 6.2 | 2.6 | 2.0 – 3.3 | 0 | -- | 1.9 | 1.2 – 2.9 |
| <i>F</i> [df1, df2] | 10.0 [2, 308]* | | | | 7.6 [2, 308]* | | | |

CI: Confidence Interval; LGB: Lesbian, Gay, Bisexual; GSS: General Social Survey; df1 = numerator degrees of freedom; df2 = denominator degrees of freedom; *significant association between sexual orientation and gun ownership at $p < 0.01$

C. ATTITUDES TOWARD GUN POLICY

LGB respondents were somewhat more likely to favor a law which would require a person to obtain police permit before he or she could buy a gun compared to heterosexuals (prevalence 81.4% versus 73.9%, respectively, bivariate test statistics F [df1, df2]=4.58 [1, 154], $p < 0.05$, not shown in Table; OR=1.66, 95% CI=1.12, 2.46, Appendix 2, Table A2b.)

Similarly, LGB respondents to the 2016 CCES were also somewhat more likely than heterosexuals to support policies that place restrictions on accessing guns (Table 4 and Appendix 2, Table A3.) Among LGB adults, support was highest for background checks (93.3%), followed by a ban on assault rifles (74.0%) and opposition to facilitating access to concealed weapon permits (72.3%). A majority (54.0%) of LGB respondents were in support of prohibiting the government from publishing the names and addresses of gun owners.

Table 4. Attitudes toward gun regulation, by sexual orientation, among respondents to the 2016 Cooperative Congressional Election Survey

| | Background checks for all sales, including gun shows and over-the-counter sales | | Prohibit ... governments from publishing names and addresses of all gun owners | | Ban assault rifles | | Make it easier ... to obtain a concealed-carry permit | |
|---------------------|---|----------------|--|---------------|----------------------|----------------|---|----------------|
| | LGB | Heterosexual | LGB | Heterosexual | LGB | Heterosexual | LGB | Heterosexual |
| | % (SE) | % (SE) | % (SE) | % (SE) | % (SE) | % (SE) | % (SE) | % (SE) |
| Support | 93.3 (0.69) | 88.7 (2.16) | 54.0 (1.13) | 61.2 (0.3) | 74.0 (1.11) | 62.0 (0.32) | 27.3 (1.07) | 41.5 (0.32) |
| Oppose | 6.4 (0.68) | 11.0 (2.15) | 45.4 (1.13) | 38.3 (0.3) | 25.1 (1.10) | 37.3 (0.32) | 72.3 (1.07) | 58.0 (0.32) |
| Refused | 0.3 (0.10) | 3.35 (0.03) | 0.6 (0.01) | 0.6 (0.04) | 0.9 (0.3) | 0.7 (0.05) | 0.4 (0.11) | 0.6 (0.04) |
| <i>F</i> [df1, df2] | 18.4 [1.7, 97901]* | | 25.3 [1.8, 105690]* | | 36.4 [1.90, 108810]* | | 89.3 [1.8, 105000]* | |
| N | 4,179 | 50,942 | 4,179 | 50,942 | 4,179 | 50,942 | 4,179 | 50,942 |

CI: Confidence Interval; LGB: Lesbian, Gay, Bisexual; GSS: General Social Survey; df1 = numerator degrees of freedom; df2 = denominator degrees of freedom; *significant association between sexual orientation and gun ownership at $p < 0.01$



CONCLUSION & RECOMMENDATIONS

LGB adults are less likely to have guns in their homes and to own guns than their heterosexual peers. Among heterosexuals and LGB people, gun ownership is the highest among non-Hispanic Whites. LGB adults are also slightly more likely than heterosexuals to favor policies that regulate guns and that do not compromise privacy. Data about gun ownership and attitudes towards gun control among transgender adults have not yet, to our knowledge, been collected.

Wide gaps in data must be filled to advance knowledge about LGBT people and gun violence. These gaps include:

- Population-level information about transgender youth suicidality or transgender people's (all ages) access to guns, despite the highest suicide attempt rates;
- Place-based (e.g., state, urban/rural) data about LGBT gun ownership;
- Population-level information about the extent to which guns are used by LGBT people or against LGBT people during attempted or completed suicide, IPV, or other forms of interpersonal violence;
- Gun-related injury and mortality among LGBT people and the role that age, race-ethnicity, socio-economic status, military status, place-related characteristics, and so forth may play in gun-related injury and mortality.

Many gaps would be filled by bolstering the federal injury surveillance system (Appendix 3) through the inclusion of sexual orientation and gender identity (SOGI) measures. SOGI measures are not included on death certificates; nor are they included in the administrative systems that track injury, or on the core demographic sections of the Uniform Crime Reports, or all relevant population-based surveys. Large population-based surveys that collect data on violence, injury, and health often collect sexual orientation data (e.g., Youth Risk Behavior Survey, National Health Interview Survey), but lack measures to make transgender respondents identifiable. In addition, periodic inclusion of questions about gun usage (versus any weapon) during attempted suicides, IPV, or other forms of interpersonal violence on large population-based health surveys such as the BRFSS, YRBS, and the California Health Interview Survey, as well as Investigator-led studies that focus on the LGBT community, may also be helpful to provide a more complete picture on gun violence and LGBT people.



APPENDICES

APPENDIX 1: QUESTION WORDING

Survey questions for sexual orientation and gun ownership and attitudes are provided below.

| Measure (Variable Name) | Survey | Wording | Responses | | | | | | | | | | | | | | | |
|-------------------------------------|--------|--|---|------------------------------|-------------------------------------|-----------------|------------|-------------|-------------|-----------|---------------|-----------------|---------------------|---------------------------|------------|----------------------------|---------------------|---|
| Sexual Orientation (SEXORNT) | GSS | Which of the following best describes you? | <ol style="list-style-type: none"> 1. Gay, lesbian or homosexual Bisexual 2. Heterosexual or straight | | | | | | | | | | | | | | | |
| Sex (Sex) | GSS | Interviewer instruction: Select gender of chosen respondent | <ol style="list-style-type: none"> 1. Male 2. Female | | | | | | | | | | | | | | | |
| Race-ethnicity (RACEHISP) | GSS | <p>A composite variable provided by GSS</p> <p>Are you Spanish, Hispanic, or Latino/Latina?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>What is your race? Indicate one or more races that you consider yourself to be.</p> <p>FIRST MENTION:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr><td>1. White</td></tr> <tr><td>2. Black or African American</td></tr> <tr><td>3. American Indian or Alaska Native</td></tr> <tr><td>4. Asian Indian</td></tr> <tr><td>5. Chinese</td></tr> <tr><td>6. Filipino</td></tr> <tr><td>7. Japanese</td></tr> <tr><td>8. Korean</td></tr> <tr><td>9. Vietnamese</td></tr> <tr><td>10. Other Asian</td></tr> <tr><td>11. Native Hawaiian</td></tr> <tr><td>12. Guamanian or Chamorro</td></tr> <tr><td>13. Samoan</td></tr> <tr><td>14. Other Pacific Islander</td></tr> <tr><td>15. Some other race</td></tr> </tbody> </table> | 1. White | 2. Black or African American | 3. American Indian or Alaska Native | 4. Asian Indian | 5. Chinese | 6. Filipino | 7. Japanese | 8. Korean | 9. Vietnamese | 10. Other Asian | 11. Native Hawaiian | 12. Guamanian or Chamorro | 13. Samoan | 14. Other Pacific Islander | 15. Some other race | <ol style="list-style-type: none"> 1. Hispanic 2. White 3. Black 4. "Other" |
| 1. White | | | | | | | | | | | | | | | | | | |
| 2. Black or African American | | | | | | | | | | | | | | | | | | |
| 3. American Indian or Alaska Native | | | | | | | | | | | | | | | | | | |
| 4. Asian Indian | | | | | | | | | | | | | | | | | | |
| 5. Chinese | | | | | | | | | | | | | | | | | | |
| 6. Filipino | | | | | | | | | | | | | | | | | | |
| 7. Japanese | | | | | | | | | | | | | | | | | | |
| 8. Korean | | | | | | | | | | | | | | | | | | |
| 9. Vietnamese | | | | | | | | | | | | | | | | | | |
| 10. Other Asian | | | | | | | | | | | | | | | | | | |
| 11. Native Hawaiian | | | | | | | | | | | | | | | | | | |
| 12. Guamanian or Chamorro | | | | | | | | | | | | | | | | | | |
| 13. Samoan | | | | | | | | | | | | | | | | | | |
| 14. Other Pacific Islander | | | | | | | | | | | | | | | | | | |
| 15. Some other race | | | | | | | | | | | | | | | | | | |
| Gun in Home (OWNGUN) | GSS | Do you happen to have in your home (or garage) any guns or revolvers? | <ol style="list-style-type: none"> 1. Yes 2. No | | | | | | | | | | | | | | | |
| Own Gun (ROWNGUN) | GSS | Do any of these guns personally belong to you? | <ol style="list-style-type: none"> 1. Yes 2. No | | | | | | | | | | | | | | | |

| Measure (Variable Name) | Survey | Wording | Responses |
|--------------------------------|--------|--|--|
| Allow Permits (GUNLAW) | GSS | Would you favor or oppose a law which would require a person to obtain police permit before he or she could buy a gun? | <ol style="list-style-type: none"> 1. Favor 2. Oppose |
| Sexual Orientation (sexuality) | CCES | With which group do you most closely identify? | <ol style="list-style-type: none"> 1. Heterosexual or straight 2. Lesbian or gay woman 3. Gay man 4. Bisexual 5. Other 6. Prefer not to say |
| Sex (gender) | CCES | Are you male or female? | <ol style="list-style-type: none"> 1. Male 2. Female |
| Race-ethnicity (race) | CCES | What racial or ethnic group best describes you? | <ol style="list-style-type: none"> 1. White 2. Black 3. Hispanic 4. Asian 5. Native American 6. Mixed 7. Other 8. Middle Eastern |
| Background Checks (CC16_330a) | CCES | Background checks for all sales, including at gun shows and over the Internet. | <ol style="list-style-type: none"> 1. Support 2. Oppose |
| Prohibit Listings (CC16_330b) | CCES | Prohibit state and local governments from publishing the names and addresses of all gun owners. | <ol style="list-style-type: none"> 1. Support 2. Oppose |
| Ban Assault Rifles (CC16_330d) | CCES | Ban assault rifles. | <ol style="list-style-type: none"> 1. Support 2. Oppose |
| Concealed-carry (CC16_330e) | CCES | Makes it easier for people to obtain concealed-carry permit. | <ol style="list-style-type: none"> 1. Support 2. Oppose |

APPENDIX 2: REGRESSION RESULTS

Regression results for the General Social Survey are reported in Table A.2a. – Table A.2c., and the regression results for the Cooperative Congressional Election Survey are reported in Table A.3. For the GSS, the region of residence is based on Census Divisions, which are the smallest geographic unit available in the public-use data file. For the CCES, we rely on statewide fixed effects, which are available in the public-use data file.

Table A2.a. Weighted logistic regression (unstandardized logit/SE and OR/95% CI) of the association between sexual orientation and gun in home among 2008-2016 GSS respondents

| | β (SE) | OR (95% CI) |
|--------------------|-----------------|-----------------------|
| LGB | -0.76 (0.19)*** | 0.47 (0.32 – 0.69)*** |
| Female | -0.45 (0.07)*** | 0.64 (0.56 – 0.73)*** |
| Age | 0.01 (0.002)*** | 1.01 (1.01 – 1.02)*** |
| Non-Hispanic White | 1.40 (0.10)*** | 3.84 (3.15 – 4.69)*** |
| New England | -0.04 (0.42) | 0.96 (0.42 – 2.20) |
| Middle Atlantic | -0.35 (0.37) | 0.71 (0.34 – 1.47) |
| East North Central | 0.31 (0.23) | 1.36 (0.87 – 2.13) |
| West North Central | 0.70 (0.24)** | 2.02 (1.25 – 3.27)** |
| South Atlantic | 0.36 (0.19) | 1.44 (0.98 – 2.10) |
| East South Central | 1.01 (0.27)*** | 2.74 (1.62 – 4.63)*** |
| West South Central | 0.98 (0.22)*** | 2.67 (1.72 – 4.13)*** |
| Mountain | 0.55 (0.21)* | 1.73 (1.14 – 2.62)* |
| Intercept | -2.35 (0.21)*** | 0.10 (0.06 – 0.14)*** |
| N | 5,875 | |
| Pseudo R-squared | 0.10 | |
| Log-likelihood | -3,407.50 | |

SE= Standard Error; OR= Odds Ratio; CI= Confidence Interval; LGB= Lesbian, Gay, Bisexual
 OR computed as the exponentiated Beta coefficients (β) * $p < .05$; ** $p < .01$; *** $p < .001$

Table A2.b. Weighted logistic regression (unstandardized logit/SE and OR/95% CI) of the association between sexual orientation, gun ownership, and attitudes towards gun laws among 2008-2016 GSS respondents

| | GUN OWNERSHIP ^a | | FAVOR GUN PERMIT LAW ^b | |
|--------------------|----------------------------|-----------------------|-----------------------------------|-----------------------|
| | β (SE) | OR (95% CI) | β (SE) | OR (95% CI) |
| LGB | 0.64 (0.54) | 1.90 (0.65 – 5.51) | 0.51 (0.20)* | 1.66 (1.12 – 2.46)* |
| Female | -2.52 (0.15)*** | 0.08 (0.06 – 0.11)*** | 0.57 (0.07)*** | 1.78 (1.55 – 2.04)*** |
| Age | 0.02 (0.004)*** | 1.02 (1.01 – 1.03)*** | 0.01 (.002)*** | 1.01 (1.01 – 1.01)*** |
| Non-Hispanic White | 0.42 (0.20)* | 1.53 (1.03 – 2.27) | -0.71 (0.09)*** | 0.49 (0.41 – 0.59)*** |
| New England | -0.32 (0.47) | 0.72 (0.29 – 1.84) | 0.18 (0.43) | 1.19 (0.51 – 2.81) |
| Middle Atlantic | 0.13 (0.39) | 1.14 (0.53 – 2.48) | 0.50 (0.30) | 1.65 (0.91 – 2.98) |
| East North Central | -0.02 (0.33) | 0.98 (0.51 – 1.86) | -0.16 (0.18) | 0.85 (0.59 – 1.22) |
| West North Central | 0.26 (0.32) | 1.30 (0.69 – 2.44) | -0.11 (0.27) | 0.90 (0.52 – 1.54) |
| South Atlantic | 0.13 (0.32) | 1.14 (0.61 – 2.13) | -0.21 (0.18) | 0.81 (0.56 – 1.16) |
| East South Central | 0.35 (0.39) | 1.42 (0.66 – 3.03) | -0.31 (0.19) | 0.73 (0.51 – 1.06) |
| West South Central | 0.87 (0.32)** | 2.38 (1.25 – 4.51)** | -0.62 (0.18)** | 0.54 (0.38 – 0.76)** |
| Mountain | 0.40 (0.36) | 1.50 (0.74 – 3.04) | -0.54 (0.19)** | 0.59 (0.41 – 0.85)** |
| Intercept | 0.43 (0.44) | 1.53 (0.65 – 3.65) | 0.96 (0.18)*** | 2.61 (1.83 – 3.71)*** |
| N | 2,068 | | 5,819 | |
| Pseudo R-squared | 0.24 | | 0.04 | |
| Log-likelihood | -1,101.76 | | -3,192.55 | |

SE= Standard Error; OR= Odds Ratio; CI= Confidence Interval; LGB= Lesbian, Gay, Bisexual * $p < .05$; ** $p < .01$; *** $p < .001$
OR computed as the exponentiated Beta coefficients (β)

^a Restricted to respondents who stated they had a gun in the house, modeled as odds that gun in house belonged to respondent

^b Odds that respondent would favor (vs. oppose) a “law which would require a person to obtain police permit before he or she could buy a gun”

Table A2.c. Weighted logistic regression (unstandardized logit/SE and OR/95% CI) of the association between sexual orientation and gun in home among 2008-2016 GSS respondents, stratified by biological sex

| | MALES | | FEMALES | |
|--------------------|-----------------|-----------------------|-----------------|-----------------------|
| | β (SE) | OR (95% CI) | β (SE) | OR (95% CI) |
| LGB | -1.16 (0.33)*** | 0.32 (0.17 – 0.60)*** | -0.49 (0.27) | 0.61 (0.36 – 1.05) |
| Age | 0.02 (0.003)*** | 1.02 (1.01 – 1.03)*** | 0.01 (0.003)** | 1.01 (1.00 – 1.02)** |
| Non-Hispanic White | 1.26 (0.13)*** | 3.53 (2.71 – 4.60)*** | 1.43 (0.15)*** | 4.19 (3.10 – 5.67)*** |
| New England | -0.03 (0.51) | 0.97 (0.36 – 2.65) | -0.08 (0.41) | 0.93 (0.41 – 2.09) |
| Middle Atlantic | -0.16 (0.39) | 0.85 (0.40 – 1.83) | -0.57 (0.40) | 0.57 (0.26 – 1.25) |
| East North Central | 0.54 (0.27)* | 1.72 (1.02 – 2.91)* | 0.05 (0.28) | 1.05 (0.61 – 1.82) |
| West North Central | 0.96 (0.38)* | 2.62 (1.24 – 5.50)* | 0.40 (0.32) | 1.50 (0.79 – 2.84) |
| South Atlantic | 0.65 (0.23)** | 1.91 (1.21 – 3.01)** | 0.06 (0.26) | 1.06 (0.63 – 1.77) |
| East South Central | 1.15 (0.32)*** | 3.17 (1.69 – 5.93)*** | 0.82 (0.33)* | 2.27 (1.19 – 4.32)* |
| West South Central | 1.26 (0.26)*** | 3.51 (2.12 – 5.83)*** | 0.68 (0.28)* | 2.44 (1.14 – 3.44)* |
| Mountain | 0.84 (0.24)** | 2.32 (1.45 – 3.71)** | 0.25 (0.29) | 1.29 (0.73 – 2.29) |
| Intercept | -2.72 (0.27)*** | 0.07 (0.04 – 0.11)*** | -2.44 (0.31)*** | 0.09 (0.05 – 0.16)*** |
| N | 2,665 | | 3,210 | |
| Pseudo R-squared | 0.11 | | 0.09 | |
| Log-likelihood | -1,623.50 | | -1,771.90 | |

SE= Standard Error; OR= Odds Ratio; CI= Confidence Interval; LGB= Lesbian, Gay, Bisexual * $p < .05$; ** $p < .01$; *** $p < .001$
OR computed as the exponentiated Beta coefficients (β); * $p < .05$; ** $p < .01$; *** $p < .001$

Table A2.d. Weighted logistic regression (unstandardized logit/SE and OR/95% CI) of the association between sexual orientation and gun in home among 2008-2016 GSS respondents, stratified by race-ethnicity

| | NON-HISPANIC WHITE | | ALL OTHER RACE/ETHNICITIES | |
|--------------------|--------------------|-----------------------|----------------------------|-----------------------|
| | β (SE) | OR (95% CI) | β (SE) | OR (95% CI) |
| LGB | -0.72 (0.23)** | 0.49 (0.31 – 0.76)** | -0.96 (0.43)* | 0.39 (0.17 – 0.90)* |
| Female | 0.01 (0.003)*** | 1.01 (1.01 – 1.02)*** | 0.02 (0.004)*** | 1.02 (1.01 – 1.03)*** |
| Age | -0.42 (0.08)*** | 0.66 (0.56 – 0.76)*** | -0.57 (0.17)** | 0.57 (0.40 – 0.80)** |
| New England | -0.01 (0.43) | 0.99 (0.42 – 2.32) | -0.42 (0.72) | 0.66 (0.16 – 2.72) |
| Middle Atlantic | -0.34 (0.35) | 0.72 (0.36 – 1.43) | -0.40 (0.73) | 0.67 (0.16 – 2.86) |
| East North Central | 0.26 (0.24) | 1.29 (0.81 – 2.07) | 0.65 (0.37) | 1.91 (0.92 – 3.96) |
| West North Central | 0.69 (0.25)** | 2.00 (1.21 – 3.29)** | 0.80 (0.45) | 2.23 (0.91 – 5.46) |
| South Atlantic | 0.40 (0.21) | 1.50 (0.99 – 2.28) | 0.22 (0.27) | 1.24 (0.72 – 2.14) |
| East South Central | 0.93 (0.26)** | 2.53 (1.50 – 4.27)** | 1.23 (0.47)* | 3.41 (1.34 – 8.67)* |
| West South Central | 1.15 (0.24)*** | 3.16 (1.98 – 5.05)*** | 0.72 (0.37) | 2.05 (0.99 – 4.25) |
| Mountain | 0.51 (0.24)* | 1.66 (1.04 – 2.66)*** | 0.69 (0.32)* | 1.99 (1.05 – 3.77)* |
| Intercept | -0.96 (0.23)*** | 0.38 (0.24 – 0.60)*** | -2.51 (0.32)*** | 0.08 (0.04 – 0.15)*** |
| N | 4,021 | | 1,854 | |
| Pseudo R-squared | 0.04 | | 0.06 | |
| Log-likelihood | -2,589.58 | | -809.59 | |

SE= Standard Error; OR= Odds Ratio; CI= Confidence Interval; LGB= Lesbian, Gay, Bisexual * $p < .05$; ** $p < .01$; *** $p < .001$
OR computed as the exponentiated Beta coefficients (β); * $p < .05$; ** $p < .01$; *** $p < .001$

Table A.3. Weighted regression results (logits) for the association between sexual orientation and attitude (support vs. oppose [referent]) towards gun legislation among adult respondents in the 2016 Cooperative Congressional Election Survey (n=55,121)

| | (1) Background Checks | (2) Prohibit Listings | (3) Ban Assault Rifles | (4) Concealed-carry |
|----------------------|--------------------------|--------------------------|---------------------------|------------------------|
| LGB | 0.67 (0.11)* | -0.36 (0.05)* | 0.81 (0.06)* | -0.72 (0.06)* |
| Female | 1.03 (0.04)* | -0.40 (0.03)* | 0.89 (0.03)* | -0.59 (0.03)* |
| Age | -0.001 (0.001) | -0.003 (0.001)* | 0.01 (0.001)* | -0.001 (0.001) |
| Black | 0.45 (0.11)* | -0.50 (0.05)* | 0.86 (0.06)* | -0.55 (0.05)* |
| Hispanic | 0.24 (0.11)* | -0.36 (0.06)* | 0.31 (0.07)* | -0.34 (0.07)* |
| Asian | 0.62 (0.16)* | -0.37 (0.07)* | 0.90 (0.09)* | -0.64 (0.08)* |
| Native American | -0.79 (0.17)* | 0.03 (0.17) | -0.56 (0.17)* | 0.58 (0.13)* |
| Middle Eastern | -0.22 (0.15) | -0.18 (0.09) | 0.04 (0.10) | -0.05 (0.09) |
| Mixed | -0.73 (0.13)* | 0.48 (0.13)* | -0.75 (0.14)* | 0.45 (0.13) |
| Other | -0.73 (0.13)* | -0.58 (0.32) | 0.81 (0.36)* | -0.11 (0.33) |
| Intercept | 1.68 (0.17)* | 1.21 (0.15)* | -1.27 (0.13)* | 0.65 (0.14)* |
| State Fixed Effects? | YES | YES | YES | YES |
| Pseudo R-squared | 0.06 | 0.02 | 0.07 | 0.04 |
| AIC | 35,860 | 72,710 | 67,850 | 71,980 |

NOTE: Standard errors are in parenthesis; * $p < .05$ (two-tailed)

APPENDIX 3: PARTIAL INVENTORY OF NATIONAL INJURY DATA SYSTEMS

<https://www.cdc.gov/injury/wisqars/InventoryInjuryDataSys.html>

BEHAVIOR RISK FACTORS/INJURY INCIDENCE

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|--|---|-------------|---------------|---------------|---|--|
| Behavioral Risk Factor Survey System (BRFSS) | CDC National Center for Chronic Disease Prevention and Health Promotion (CDC NCCDPHP) | 2018 | Annual survey | Yes | <p>C08.01 Format 1: What is your sex? Format 2: What was your sex at birth? Was it... Read if format 2 is selected: 1 Male 2 Female2017 Do not read: 7 Don't know / Not sure 9 Refused</p> <p>M21.01a (males) Which of the following best represents how you think of yourself? 1 = Gay 2 = Straight, that is, not gay 3 = Bisexual 4 = Something else 7 = I don't know the answer 9 = Refused</p> | <p>Sex (male/female only) SAB (sex assigned at birth – new in 2018)</p> <p>optional module includes: SO (identity) GI (gender identity) Transgender status</p> |

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|-----------------------------------|---|-------------|--|---------------|--|--------------------------------|
| | | | | | <p>M21.01b (females) Which of the following best represents how you think of yourself? 1 = Lesbian or Gay 2 = Straight, that is, not gay 3 = Bisexual 4 = Something else 7 = I don't know the answer 9 = Refused</p> <p>M21.02 Do you consider yourself to be transgender? 1 Yes, Transgender, male-to-female 2 Yes, Transgender, female to male 3 Yes, Transgender, gender nonconforming 4 No</p> | |
| Youth Risk Behavior Survey (YRBS) | CDC-Division of Adolescent and School Health (DASH) | 2017 | Biennial state and national high school survey | Yes | <p>Which of the following best describes you? A. Heterosexual (straight) B. Gay or lesbian C. Bisexual D. Not sure</p> <p>During your life, with whom have you had sexual contact? A. I have never had sexual contact B. Females C. Males D. Females and males</p> | SO (identity) SO (behavior) |

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|--|--|-------------|-------------------------|---------------|---|--------------------------|
| The Second Injury Control and Risk of Injury Survey (ICARIS) | Dept. of Health and Human Services (US DHHS); CDC-National Center for Injury Prevention (NCIP) | 2001-2003 | Periodic survey | No | N/A | Sex is male/female only. |
| National Health Interview Survey (NHIS) | CDC-National Center for Health Statistics (CDC-NCHS) | 2018 | Annual household survey | Yes | <p>AS11 (males 18+) Which of the following best represents how you think of yourself?</p> <p>1 Gay 2 Straight, that is, not gay 3 Bisexual 4 Something else 5 I don't know the answer 7 Refused</p> <p>AS12 (females 18+) Which of the following best represents how you think of yourself?</p> <p>1 Lesbian or gay 2 Straight, that is, not lesbian or gay 3 Bisexual 4 Something else 5 I don't know the answer 7 Refused</p> | |

INJURY MORBIDITY DATA

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|---|----------|-------------|--|---------------|----------------------|---|
| National Hospital Ambulatory Medical Care Survey (NHAMCS) | CDC-NCHS | 2018 | Annual survey | No | N/A | Sex is male/female only. |
| National Ambulatory Medical Care Survey (NAMCS) | CDC-NCHS | 2018 | Annual survey | No | N/A | Sex is male/female only. |
| National EMS Information System (NEMIS) | NHTSA | On-going | National database used to store EMS data | No | N/A | "Gender" field offers male/female options. |
| Healthcare Cost & Utilization Project (HCUP) | AHRQ | On-going | A family of databases related to hospital-based care | No | N/A | Sex field presents data with male/female options. |

INJURY DEATHS-DEATH CERIFICATES

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|---|----------|-------------|-----------------------------|---------------|----------------------|--------------------------|
| National Vital Statistics System (NVSS) | CDC-NCHS | Ongoing | Ongoing reporting mechanism | No | N/A | Sex is male/female only. |

VIOLENT DEATH DATA

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|---|----------|-------------|-----------------------------|---------------|----------------------|--|
| National Incident Based Reporting System (NIBRS) | FBI | On-going | Ongoing reporting mechanism | No | N/A | Sex is male/female only. |
| National Violent Death Reporting System (CDC-NVDRS) | CDC-NCIP | On-going | Ongoing reporting mechanism | Limited | N/A | Sex is male/female only. Some mention of SOGI in narratives submitted to NVDRS |
| Uniform Crime Reports-Supplemental Homicide Reports (UCR-SHR) | FBI | On-going | Ongoing reporting mechanism | No | N/A | Sex is male/female only. Possible to identify same-sex partners/exes through relationship between victim and suspect and sex of victim/suspect. |

CRIME AND VICTIMIZATION DATA

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|---|----------|-------------|-----------------------------|---------------|----------------------|---|
| National Incident Based Reporting System (NIBRS) | FBI | On-going | Ongoing reporting mechanism | No | N/A | Sex is male/female only. |
| National Violent Death Reporting System (CDC-NVDRS) | CDC-NCIP | On-going | Ongoing reporting mechanism | Limited | N/A | Sex is male/female only. Some mention of SOGI in narratives submitted to NVDRS |

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|---|--------|-------------|-----------------------------|---------------|---|--|
| Uniform Crime Reports-Supplemental Homicide Reports (UCR-SHR) | FBI | On-going | Ongoing reporting mechanism | No | N/A | Sex is male/female only. Possible to identify same-sex partners/exes through relationship between victim and suspect and sex of victim/suspect. |
| National Crime Victimization Survey (NCVS) | BJS | 2016 | Annual survey | Yes | <p>83. ORIENTATION_MALE Which of the following best represents how you think of yourself?</p> <p>1 Gay 2 Straight, that is, not gay 3 Bisexual 4 Something else 5 I don't know the answer 6 Refused</p> <p>84. ORIENTATION_FEMALE Which of the following best represents how you think of yourself?</p> <p>1 Lesbian or gay 2 Straight, that is, not lesbian or gay 3 Bisexual 4 Something else 5 I don't know the answer 6 Refused</p> <p>85. GENID_BIRTH What sex were you assigned at birth, on your original birth certificate?</p> <p>1 Male 2 Female 3 Refused 4 Don't know</p> | For individuals aged 16 and older. SO (identity) SAB (sex assigned at birth) GI (gender identity) |

| Name | Agency | Latest Year | Type | SOGI Measures | Relevant Question(s) | Notes |
|------|--------|-------------|------|---------------|--|-------|
| | | | | | <p>86. GENID_DESCRIBE Do you currently describe yourself as male, female or transgender? 1 Male 2 Female 3 Transgender 4 None of these</p> <p>87. GENID_CONFIRM Just to confirm, you were assigned (male/female) at birth and now (describe yourself as male/ describe yourself as female/ describe yourself as transgender/ do not describe yourself male, female, or transgender). Is that correct? 1 Yes 2 No - SKIP back to 85 and/or 86 to correct 3 Refused 4 Don't Know</p> | |



ENDNOTES

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- ¹² Walters, M.L., J. Chen, and M.J. Breiding, *The National Intimate Partner and Sexual Violence Survey (NISVS): 2010 Findings on Victimization by Sexual Orientation*. 2013, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention: Atlanta, GA..
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²² <https://www.bjs.gov/ucrdata/abouttheucr.cfm>

²³ <https://www.bjs.gov/index.cfm?ty=dcdetail&iid=245>

²⁴ Estimates of single-incident LGBT bias were obtained by counting the number of single incident victims of sexual orientation bias (n=1,255 less the 23 anti-heterosexual bias victims) and adding this to the number of single incident victims of gender identity bias (n=131) to obtain a count of 1,363 anti-LGBT bias victims. We then divided this number by the total number of hate crime victims (N=7,615) (1,363/7,615= 17.9%). United States Department of Justice, FBI. *Hate Crime Statistics*. 2016 [cited 2018 September 19]; Available from: <https://ucr.fbi.gov/hate-crime/2016/tables/table-1>.

²⁵ Newport, F. U.S., *Estimate of LGBT Population Rises to 4.5%*. 2017 [cited September 19 2018]; Available from: <https://news.gallup.com/poll/234863/estimate-lgbt-population-rises.aspx>.

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²⁸ <http://gss.norc.org/About-The-GSS>

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³⁰ Pew Research Center, *Evaluating Online Nonprobability Surveys*. May 2016: <http://www.pewresearch.org/2016/05/02/evaluating-online-nonprobability-surveys/>.

³¹ <http://sda.berkeley.edu/sdaweb/analysis/?dataset=gss16>

³² To derive estimates of the number of gun owners (and non-owners) reported in Table 1, information was incorporated from multiple additional data sources. The number of US residents age 18 and older was derived from 2017 population projections issued by the Census, accessed via American Fact Finder "Annual Estimates of the Resident Population by Single Year of Age and Sex for the United States: April 1, 2010 to July 1, 2017: 2017 Population Estimates" (<https://factfinder.census.gov/bkmk/table/1.0/en/PEP/2017/PEPSYASEXN>; see 2017 Estimate for United States/Both Sexes). An estimated 252,063,800 adults age 18+ currently live in the US.

The estimated percentage of US adults who identify as LGBT is derived from adult (age 18+) respondents to the 2017 Gallup Daily Tracking Survey (<https://www.gallup.com/174155/gallup-daily-tracking-methodology.aspx>); 4.5% of who identified as LGBT. Applying the % LGBT to the US population estimate from the Census projections, and rounding to the nearest 1,000, we estimate that 11,343,000 LGBT adults currently live in the US.

Proportion of gun ownership by sexual orientation was derived from the GSS as mentioned above. Since the GSS did not assess gender identity, we had to adjust the estimate of the LGBT population to exclude heterosexual transgender adults.

The number of transgender adults (regardless of sexual orientation) living in the United States were extracted from Flores, A. R., Herman, J. L., Gates, G. J., & Brown, T. N. T. (2016). HOW MANY ADULTS IDENTIFY AS TRANSGENDER IN THE UNITED STATES? Los Angeles: Williams Institute. (<https://williamsinstitute.law.ucla.edu/wp-content/uploads/How-Many-Adults-Identify-as-Transgender-in-the-United-States.pdf>) which estimated that 1,397,150 transgender adults currently live in the United States.

The weighted proportion of transgender adults who identified their sexual identity as heterosexual/straight (72.0%) or lesbian, gay, or bisexual (28.1%) was derived from the 2017 BRFS (unpublished analyses by The Williams Institute).

Applying these proportions to the estimated number of transgender adults, and rounding to the nearest 1,000, we estimated there were 392,000 LGB transgender adults and 1,005,000 heterosexual transgender adults.

The number of lesbian, gay, and bisexual adults was derived by subtracting the 2017 BRFS estimate of the number of heterosexual transgender adults (n=1,005,000), from the 2017 Gallup estimate of the number of LGBT adults (11,343,000). After rounding to the nearest 1,000, we estimated there were 10,338,000 LGB adults living in the United States, and 241,726,000 heterosexual/straight (non-LGB) adults, the latter computed as the total US population minus the LGB population.

Finally, for the number of gun owners by sexual orientation, we applied the GSS gun ownership percentages (and surrounding 95% confidence intervals) to the estimated LGB and heterosexual/straight population counts, and after rounding to the nearest 1,000, determined there were 1,943,000 LGB gun owners (18.8% of 10,338,000) and 84,846,000 heterosexual/straight gun owners (35.1% of 241,726,000). We similarly estimated the number of non-gun owners, and number of people who refused to answer, by applying the GSS percentages (and 95% CI) for these responses to the same LGB/heterosexual population denominator.