DENNIS J. HERRERA, State Bar #139669
City Attorney
WAYNE SNODGRASS, State Bar #148137
CHRISTINE VAN AKEN, State Bar #241755
Deputy City Attorneys
1 Dr. Carlton B. Goodlett Place
City Hall, Room 234
San Francisco, California 94102-4682
Telephone: (415) 554-4633
Facsimile: (415) 554-4699
E-Mail: christine.van.aken@sfgov.org

Attorneys for Defendants
CITY AND COUNTY OF SAN FRANCISCO,
THE MAYOR OF SAN FRANCISCO and
THE CHIEF OF THE SAN FRANCISCO POLICE DEPARTMENT

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

ESPANOLA JACKSON, PAUL COLVIN, THOMAS BOYER, LARRY BARSETTI, DAVID GOLDEN, NOEMI MARGARET ROBINSON, NATIONAL RIFLE ASSOCIATION OF AMERICA, INC., and SAN FRANCISCO VETERAN POLICE OFFICERS ASSOCIATION, Plaintiffs, vs. CITY AND COUNTY OF SAN FRANCISCO, THE MAYOR OF SAN FRANCISCO, and THE CHIEF OF THE SAN FRANCISCO POLICE DEPARTMENT, in their official capacities, Defendants.	Case No. C09-2143 RS **DECLARATION OF DANIEL W. WEBSTER IN SUPPORT OF CITY AND COUNTY OF SAN FRANCISCO'S OPPOSITION TO PLAINTIFFS' MOTION FOR PRELIMINARY INJUNCTION** Hearing Date: Oct. 4, 2012 Time: 1:30 p.m. Place: 450 Golden Gate Ave. Courtroom 3 - 17th Floor San Francisco, CA 94102

I, Daniel W. Webster, declare as follows:

1. For the past ten years, I have served as Co-Director of the Johns Hopkins Center for Gun Policy. I have also been Deputy Director for Research for the Johns Hopkins Center for the Prevention of Youth Violence since 2005.

2. I began my career in public safety research in 1985 as a Research Associate at the University of Michigan and have focused most of my research on gun-related injuries and violence during the past 23 years. I have a Masters of Public Health degree from the University of Michigan and a doctorate in Health Policy and Management from the Johns Hopkins School of Public Health. This graduate training included many advanced courses in epidemiology, research methods, and statistical analysis.

3. Immediately prior to joining the faculty at Johns Hopkins, I directed a program on violence research at the Washington (DC) Hospital Center. I joined the faculty of the Johns Hopkins School of Public Health in 1992, and I am a tenured Professor of Health Policy and Management with a joint appointment in the School of Education's Division of Public Safety Leadership. As noted above, I am the Co-Director of the Johns Hopkins Center for Gun Policy and the Deputy Director for Research for the Johns Hopkins Center for the Prevention of Youth Violence since 2005. I teach graduate courses on violence prevention and research and evaluation methods at Johns Hopkins, direct a PhD program in Health and Public Policy, and serve on the steering committee of a pre- and post-doctoral training program in violence prevention research funded by the National Institutes of Health.

4. I have directed numerous studies related to gun violence and its prevention. I have published 66 articles in scientific, peer-reviewed journals, the vast majority of these addressed some aspect of violence and/or firearm injuries and their prevention. My CV, detailing these publications, is attached as Exhibit 1 to this report.

5. I have been retained by the City and County of San Francisco to render expert opinions in this case. I make this declaration on the basis of my training and expertise, the research discussed herein, and the work that I have done in this case to date. This declaration does not constitute my final written expert report. For my work in this case, I am being compensated at a rate of $250 per hour.

I. THE AVAILABILITY OF FIREARMS IN THE HOME INCREASES THE RISKS OF SUICIDE, HOMICIDE, AND DEATHS FROM UNINTENTIONAL SHOOTINGS.

6. It is my opinion that the availability of firearms in homes increases the risks of suicide, homicide, and deaths from unintentional shootings. In the following paragraphs, I describe the research that supports my opinion.

A. Gun Availability and Suicides.

7. Debates about gun policy tend to focus solely on violent crime, but policies and personal decisions about keeping firearms in the home should take into consideration that sixty percent of firearm-related deaths which occur in the U.S. are suicides.[1] A study which used data from the National Mortality Follow-back Survey – a detailed survey of a systematic random sample of all deaths in the U.S. in 1993 of persons age 15 years or older – focused on homicides and suicides. Data from this study revealed that among the violent deaths which occurred within the home, suicides were more than twice as common as homicides.[2] In San Francisco in 2009, suicides were more than twice as common as homicides (97 vs. 40) and there were nearly as many firearm suicides as firearm homicides (19 vs. 22).[3] Because the research cited below indicates that the accessibility of firearms significantly increases the risk of suicide, especially for adolescents and young adults, San Francisco has an interest in reducing the availability of firearms within homes to children, adolescents, and unauthorized individuals.

8. Furthermore, policies concerning how firearms are kept within the home should consider that suicides within the home are more than twice as common as homicides in the home, firearms are by far the most common method used in both causes of death, and the presence of firearms in the home is associated with increased risk of both of these causes of death.

---

[1] 18,735 of 31,347 firearm deaths in the U.S. in 2009. National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999-2009. Centers for Disease Control and Prevention, Atlanta, GA. Accessed August 31, 2012.

[2] Weibe DJ. Homicide and suicide risks associated with firearms in the home. *Annals of Emergency Medicine* 2003;41:771-782.

[3] Data generated from Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2009 on CDC WONDER Online Database, released 2012. Accessed August 31, 2012.

9. I reviewed several types of studies to arrive at my conclusions about the relationship between firearm availability within the home and the risk of suicide, homicide, and unintentional firearm deaths. The studies use different designs, study samples or populations, and analytic methods, but the findings are consistent in showing a positive association between keeping firearms in the home and the risk of suicide. The findings are also consistent with a widely accepted principle among experts in the study and prevention of youth violence – that making the most lethal means of self-harm less accessible will generally reduce risks for suicide and result in fewer suicides. This principle and recommendation is referred to in many consensus documents such as recent reports on suicide prevention by the U.S. Surgeon General and the National Action Alliance for Suicide Prevention[4] and the World Health Organization.[5]

Household Studies

10. There have been many case-control studies of households which measure the association between the presence of firearms in the home and suicide, homicide, or unintentional shooting death. Case-control studies involve comparisons between cases – those with the condition or outcome of interest – and controls – those who do not have the condition or outcome of interest. Case-control studies determine whether cases had greater exposure to a factor of interest, in this case being in a home with a firearm, than did controls.

11. Nearly all of the case-control studies have shown a positive relationship between gun ownership and suicides, with firearm ownership being associated with large increases in the risk of suicide to household members. In a study of 803 suicides, 565 of which occurred within residences in two metropolitan counties, Dr. Arthur Kellermann and colleagues[6] reported that firearm ownership was associated with a 4.7-fold increase in suicide after controlling differences between cases and controls on a number of factors that are associated with suicide risks including age, sex, race, failure to

---

[4] U.S. Department of Health and Human Services (HHS) Office of the Surgeon General and National Action Alliance for Suicide Prevention. *2012 National Strategy for Suicide Prevention: Goals and Objectives for Action.* Washington, DC: HHS, September 2012.

[5] World Health Organization. Public Health Action for the Prevention of Suicide: A Framework. Geneva, 2012.

[6] Kellermann AL, Rivara FP, Somes G, et al. Suicide in the home in relation to gun ownership. *New England Journal of Medicine* 1992;327:467-472.

graduate from high school, living alone, alcohol consumption, prior alcohol-related hospitalization, current use of prescription medication for depression or mental illness, and use of illicit drugs. Elevated suicide risks were observed only for suicides committed with a firearm. Individuals who committed suicide by other means were no more or less likely to have had a firearm in their home. The association between being in a home with a firearm and suicide was stronger for males (aOR = 6.4), who would be much more likely to have acquired the firearm(s) kept in the home, than for females (aOR = 3.3). Thus the data indicate that the risk of suicide was three times higher for women living in homes with a firearm even though females are far less likely than are males to purchase and own firearms. This substantial increase in suicide risk for females makes it difficult to attribute the firearms-suicide association solely to suicidal intent prompting firearm ownership. The guns-suicide association was also much stronger in situations where there was no prior history of mental illness (aOR = 32.8) than when there was mental illness (aOR = 3.0).

12. Cummings and colleagues conducted a case-control study to examine the association between legal purchases of handguns and suicide and homicide using data from a large population of individuals enrolled in a health maintenance organization in metropolitan Seattle, Washington over a 13-year period.[7] One advantage to this study over the one by Kellermann and colleagues is that it does not rely upon data from proxy respondents for the cases but uses pre-existing administrative data to measure risk factors including handgun purchases. The cases were 353 suicide victims and 117 homicide victims who were members of the HMO. Each case was matched with five control subjects from the same HMO membership of the same age, sex, and ZIP code of residence. After controlling for the individual's age, sex, the number of family members in the home, and neighborhood affluence and education levels, the risk of suicide was 1.9 times higher for members of households where a family member had legally purchased a handgun from a licensed gun dealer. Elevated risks for suicide within homes with handgun purchases were exclusive to suicides committed with a firearm (RR = 3.1); however, there was no association between handgun purchase and suicide by other means. The

[7] Cummings P, Koepsell TD, Grossman DC, Savarino J, Thompson RS. The association between the purchase of a handgun and homicide or suicide. *American Journal of Public Health* 1997;87:974-8.

association between handgun purchases and suicide risks were slightly higher for the person who purchased the handgun (RR = 2.0, CI = 1.4 to 2.8) than for other family members (RR = 1.5, CI = 0.9 to 2.5). The elevated risk of suicide associated with handgun purchase history was greatest when a handgun had been purchased less than a year before death, nevertheless, handgun purchases 5 or more years prior were still associated with increased risk of suicide within the home (RR = 1.7, CI =1.3 to 2.3). Furthermore, the median interval between the most recent handgun purchase by a household member and a suicide was 10.7 years, indicating that in most instances the suicide victim did not purchase a gun in order to complete a plan to commit suicide but rather used a firearm that had been purchased years ago, sometimes by individuals other than the one who committed suicide.

13. In a nationally-representative study, based on data from the National Mortality Follow-Back Survey and the National Health Interview Study, firearm ownership was associated with more than a 3-fold increase in the risk of suicide for household members (adjusted odds ratio – aOR = 3.44, CI = 3.06 to 3.86).[8] The increased risk of suicide connected to guns in the home was exclusive to suicides committed with a firearm. Risks for suicide by means other than firearms were slightly lower among those living in a home with a gun, but much stronger association between guns and firearm suicide led to a net increase in suicide by any means.

14. In the two case-control studies which examined the relationship between household firearm access and suicide risk within age groups, the risk of suicide resulting from access to a firearm in the home was elevated the most among adolescents and young adults. The positive association between firearm ownership and suicides in the home in Kellermann et al.'s study indicated a 10-fold increase in risk of suicide for those ages 24 and younger (aOR = 10.4, CI 1.6 to 68.8). In the national study by Wiebe, age-group-specific suicide risk increases connected to household firearm ownership were greatest for young adults ages 18-24 (aOR = 4.50, CI = 3.26 to 6.21).

[8] Weibe DJ. Homicide and suicide risks associated with firearms in the home. *Annals of Emergency Medicine* 2003;41:771-782.

15. Ready access to the most lethal method for suicide is likely to greatly influence suicide risks for adolescents for whom suicides are often very impulsive acts,[9] and ready availability of the most lethal means of self-harm determines whether an individual survives suicidal acts.[10] [11] Adolescents and young adults are most likely to live in households with older adults, and it seems unlikely that the firearms brought into the homes in cases where someone under age 25 committed suicide would have been prompted by the victim's intention to commit suicide. Research has shown that firearms used by adolescent suicide victims were typically owned by parents or other family members.[12]

16. Suicide by firearm is the third leading cause of death for persons ages 15 to 24.[13] Local studies have found that about two-thirds of adolescents who commit suicide with a firearm obtained the gun from within their own homes or the home of a relative or friend[14] and where the gun was typically left unlocked.[15]

17. A series of studies of adolescent suicides in Western Pennsylvania have shown that adolescents who died from suicides there were much more likely to have lived in homes with firearms than adolescents in the following comparison groups – adolescents who had been hospitalized for nonfatal suicide attempts and had psychiatric disorders,[16] adolescents with psychiatric disorders who

---

[9] Azrael D, Hemenway D, Miller M, Barber CW, Schackner R. Youth suicide: insights from 5 years of Arizona Child Fatality Review Team data. *Suicide and Life Threatening Behavior* 2004;34:36-43.

[10] Miller M, Azrael D, Hemenway D. The epidemiology of case fatality rates for suicide in the Northeast. *Annals of Emergency Medicine*. 2004;43:723-30.

[11] Vyrostek SB, Annest JL, Ryan GW. Surveillance for fatal and nonfatal injuries—United States, 2001. *MMWR Surveillance Summaries.* 2004;53:1–57.

[12] Johnson RM, Barbor C, Azrael D, Clark DE, Hemenway D. Who are the owners of firearms used in adolescent suicides? *Suicide & Life Threatening Behavior.* 2010;40:609–611.

[13] National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999-2007. Centers for Disease Control and Prevention, Atlanta, GA. Accessed August 31, 2012.

[14] Grossman DC, Reay DT, Baker SA. Self-inflicted and unintentional firearm injuries among children and adolescents: the source of the firearm. *Arch Pediatr Adolesc Med.* 1999;153:875-878.

[15] Shah S, Hoffman RE, Wake L, Marine WM. Adolescent suicide and household access to firearms in Colorado: results of a case-control study. *Journal of Adolescent Health* 2000;26:157-163.

[16] Brent DA, Perper JA, Goldstein CE, et al. Risk factors for adolescent suicide: a comparison of adolescent suicide victims with suicidal inpatients. *Archives of Gen Psychiatry* 1988;45:581-8.

had never attempted suicide,[17] adolescents with a lifetime history of affective disorders who were living at home with their families,[18] adolescents in a demographically-matched group of community controls without psychiatric conditions,[19] and a general survey of adolescents drawn from the same area as the suicides.[20]

18. As a study design, case-control studies have limitations, perhaps most importantly the difficulty in discerning the direction of cause (e.g., firearm ownership) and effect (e.g., suicide) because suicidal intentions can cause someone to bring a gun into their home as well as having a gun in the home contributes to a suicide. Yet the evidence indicates that suicide risks are elevated by having firearms in the home for those who typically do not purchase or bring firearms into the home – women and adolescents. Some have speculated that the consistently positive association between firearm ownership and heightened risk of suicide might be due to unmeasured confounders – factors which are correlated with firearm ownership that are causally related to suicide risks. However, there does not appear to be higher rates of mental illness or suicidal ideation in homes with firearms compared with homes with no firearms.[21] [22] [23]

---

[17] Brent DA, Perper JA, Allman CJ, Moritz G, Wartella ME, Zelenak JP. The presence and accessibility of firearms in the homes of adolescent suicides, a case-control study. *Journal of the American Medical Association* 1991;266;2989–2995.

[18] Brent D, Perper JA, Moritz G, Baugher M, Schweers J, Roth,C. Suicide in affectively ill adolescents: A case-control study. *Journal of Affective Disorders* 1994;31:193–202.

[19] Brent DA, Perper JA, Moritz G, Baugher M, Allman C. Suicide in adolescents with no apparent psychopathology. Journal of the American Academy of Child and Adolescent Psychiatry 1993;32:494–500.

[20] Brent DA, Perper JA, Moritz G, Baugher M, Schweers J, Roth C. Firearms and adolescent suicide: a community based case control study. *American Journal of Diseases of Children* 1993;147:1066-1071.

[21] Miller M. Recent psychopathology, suicidal thoughts and suicide attempts in households with and without firearms: findings from the National Comorbidity Study Replication. *Injury Prevention* 2009;15:183-7.

[22] Hemenway D, Miller M. Association of rates of household handgun ownership, lifetime major depression, and serious suicidal thoughts with rates of suicide across US census regions. *Injury Prevention* 2002;8:313-8.

23 Betz ME, Barber C, Miller M. Suicidal behavior and firearm access: results from the second injury control and risk survey. *Suicide & Life Threatening Behavior*. 2011;41:384-91.

Cohort Studies

19. Cohort studies measure exposures (e.g., having firearms in your home) within a population and how those exposures are associated with subsequent outcomes (e.g., suicides). Wintemute and colleagues conducted a population-based cohort study to compare mortality among 238,292 persons who purchased a handgun in California in 1991 with that in the general adult population of the state. Mortality was examined for a period from the time of handgun purchase through the end of 1996. Sex-specific standardized mortality ratios (SMR – the ratio of the number of deaths among handgun purchasers to the number expected on the basis of age- and sex-specific rates among adults in California) were calculated for several age groups. During the first year after the purchase of a handgun, suicide was the leading cause of death among handgun purchasers. Handgun purchasers experienced suicide rates more than four times that of all Californians. The increased risk was attributable entirely to the excess risk of suicide with a firearm (SMR = 7.1). While the immediate risk for suicide among handgun purchasers is likely to reflect suicidal wishes prompting handgun purchases, handgun purchasers remained at increased risk for suicide by firearm throughout the six year study period, especially among women (SMR = 15.5 compared with 3.2 for men)[24].

Aggregate-Level Studies: Cross-Sectional Studies

20. The case-control and cohort studies referenced above measure the exposure and outcome at the level of individuals or households. In contrast, aggregate-level studies measure relationships between variables which are measured in the aggregate such as by city, county, state, or national. Several aggregate-level (mostly US state-level) studies have shown that populations with higher rates of firearm ownership tend to have significantly higher risks for firearm suicide and suicide by any means.[25] [26] [27] [28] [29] Perhaps the most rigorous of these studies was led by Harvard physician and

---

[24] Wintemute GJ, Parham CA, Beaumont JJ, Wright M, Drake C. Mortality among recent purchasers of handguns. *New England Journal of Medicine* 1999;341:1583-1589.

[25] Birckmayer J, Hemenway D. Suicide and firearm prevalence: Are youth disproportionately affected? *Suicide & Life Threatening Behavior* 2001;31:303–10.

[26] Markush RE, Bartolucci AA. 1984. Firearms and suicide in the United States. *Am. J. Public Health* 74:123–27.

[27] Miller M, Azrael D, Hemenway D. Firearm availability and suicide, homicide, and unintentional firearm deaths among women. *Journal of Urban. Health* 2002;79:26–38.

epidemiologist Matthew Miller who is considered by many to be the nation's leading expert on the relationship between the availability of lethal means of suicide and suicide risks. Miller and his colleagues analyzed data on suicide rates across the 50 U.S. states and controlled for differences in rates of poverty, urbanization, unemployment, mental illness, and drug and alcohol dependence and abuse.[30] As would be expected if access to firearms in the home increased the risk for suicide, the prevalence of household firearm ownership was positively associated with suicide rates (the higher the prevalence of firearm ownership the higher the rate of suicide), and the positive association was limited to suicides committed with firearms.

Aggregate-Level Studies: Longitudinal Studies

21. Most aggregate-level studies which examine the association between firearm ownership and suicide have been cross-sectional, comparing suicide rates with gun ownership for a selected time period. Studies based on longitudinal data, which compare *changes* in firearm ownership in relation to *changes* in suicide rates are less vulnerable to potential threats to validity. Miller and colleagues conducted such a study by examining annual changes in suicides in relation to annual changes in a validated, surrogate measure of firearm ownership[31] over the period of 1980 through 2002. After statistically controlling for changes in age, unemployment, per capita alcohol consumption, and poverty, for every 10 percent reduction in firearm ownership, there was a 4.2 percent reduction in the rate of suicides with firearms and a 2.5 percent reduction in suicides by any means. There was no relationship between changes in firearm ownership and changes in non-firearm suicides.[32]

---

[28] Miller M, Azrael D, Hemenway D. Firearm availability and unintentional firearm deaths, suicide, and homicide among 5–14 year olds. *Journal of Trauma.* 2002;52:267–274.

[29] Miller M, Azrael D, Hemenway D. Household firearm ownership and suicide rates in the United States. *Epidemiology* 2002;13:517–524.

[30] Miller M, Lipmann SJ, Azrael D, Hemenway D. Household firearm ownership and rates of suicide across the 50 United States. *Journal of Trauma* 2007;62:1029-34.

[31] Azrael D, Cook PJ, Miller M. State and local prevalence of firearm ownership: measurement, structure and trends. *Journal of Quantitative Criminology* 2004;20:43-62.

[32] Miller M, Azrael D, Hepburn LM, Hemenway D, Lipmann SJ. The association between changes in household firearm ownership and rates of suicide in the United States, 1981-2002. *Injury Prevention* 2006;12:178-182.

B. Gun Availability and Homicides.

22. One third of all homicides in the U.S. occur in or around residential dwellings (Wiebe, 2003). In an in-depth study of homicides which occurred in or around residential dwellings in geographically diverse metropolitan counties, of the cases in which the victim-perpetrator relationship was known, 52 percent of the victims were murdered by a spouse, intimate partner, first-degree family member, or roommate of the perpetrator, 37 percent were a friend or an acquaintance, and only 4 percent were strangers.[33] Thus, ready access to a firearm within the home when arguments or altercations occur could determine whether such conflicts result in a homicide as well as a community's homicide rate. This may be especially true for women's risk of homicide. One third of all female homicide victims in the U.S. are killed by an intimate partner.[34] Twelve percent of all violent crimes and 22.6 percent of all violent crimes committed against females are committed by the victims' intimate partners (e.g., spouses, boyfriends),[35] who often live in the same household with the victim.

Household Studies

23. Kellermann and colleagues used a case-control study design to examine the relationship between firearm ownership and the risk of homicide in the home.[36] The cases were homicide incidents which occurred within residences in three metropolitan counties and included 347 victims. Controls were matched with cases by sex, race, age group, and neighborhood of residence. As noted above, when the relationship between the victim and offender was known, most of the victims were related to, intimate partners with, or roommates of the perpetrator, and only four percent were strangers. After statistically controlling for differences due to home rental versus ownership, living alone, household

---

[33] Kellermann AL, Rivara F, Rushforth NB, et al. Gun ownership as a risk factor for homicide in the home. *New England Journal of Medicine* 1993;329:1084-1091.

[34] Fox JA, Zawitz MW. *Homicide Trends in the United States.* Bureau of Justice Statistics, Office of Justice Programs, U.S. Department of Justice. http://bjs.ojp.usdoj.gov/content/homicide/relationship.cfm. Accessed Aug. 8, 2011.

[35] Bureau of Justice Statistics. *Criminal Victimization in the United States, 2008 – Statistical Tables.* Table 43a. NCJ 231173 Office of Justice Programs, U.S. Department of Justice, Washington, DC, May 2011.

[36] Kellermann AL, Rivara F, Rushforth NB, et al. Gun ownership as a risk factor for homicide in the home. *New England Journal of Medicine* 1993;329:1084-1091.

members' involvements in fights within the home, history of arrest, and illicit drug use, firearm ownership was associated with risk of homicide that was 2.7 times higher than in homes without firearms (aOR = 2.7, 95% CI = 1.6 to 4.4) . The firearm-homicide relationship was strongest for homicides committed by the victim's intimate partner or family member and indicated that the risk of domestic homicide increased nearly eightfold for in homes with firearms (aOR = 7.8, 95% CI = 2.6 to 23.2).

24. A subsequent study drawing upon the same data in the Kellermann study focused on a subset of the cases in which the person killed was a woman. In this study, there was a nearly fivefold increased risk of a woman being the victim of a homicide associated with living in a home with firearms.[37] In the majority of these cases, the victim was killed by an intimate partner or other family member. I was a co-investigator of a subsequent case-control study of risk factors for intimate partner homicide of women who had been in physically abusive intimate relationships. The study gathered data in eleven cities and controlled for a wide range of risk factors including nature of prior intimate partner violence, substance abuse, relationship characteristics, as well as abuser and victim characteristics. This study found that the abuser's ownership of a firearm was associated with a fivefold increase in risk of intimate partner homicide (aOR = 5.38). The study also examined associations between factors present in the most serious incidents of intimate partner violence and found that the abuser's use of a firearm increased the risk of lethal outcomes 41 times above that of incidents in which a firearm was not involved.[38]

25. In addition to examining the association between handgun purchases and suicide risks to household members, the study of the HMO population cited above (Cummings et al. 1997) also reported that the risk of homicide was more than twice as high (RR = 2.2) within households where there had been one or more handguns purchased. The elevated risk for homicide was similar among the handgun purchaser and his or her family members. A concern about case-control studies is that the

---

[37] Baily JE, Kellermann AL, Somes G, Banton JG, Rivara F, Ruthforth NB. Risk factors for violent death of women in the home. *Archives of Internal Medicine* 1997;15:777-782.

[38] Campbell JC, Webster DW, Koziol-McLain J, et al. Risk factors for femicide within physically abusive intimate relationships: Results from a multi-site case control study. *American Journal of Public Health* 2003; 93:1089-1097.

risk of being a homicide victim could prompt gun acquisition and confound the estimated causal effect of gun ownership on homicide risks. However, in Cummings study of the HMO population, the median interval between first family handgun purchase and any homicide death was 11.3 years and the risk of homicide was unrelated to how recently a handgun was purchased. Thus it seems unlikely that the association measured is due to immediate homicide risks prompting gun ownership.

26. Wiebe's (2003) nationally representative study of the risk of violent death associated with the presence of guns in the home demonstrated a positive association between living in a home with at least one firearm and homicide victimization. Overall, the odds of a gun in the home was 41 percent higher among victims of homicide compared with demographically-matched controls. The positive association between firearm ownership and homicide risk was greater for females (aOR = 2.72) than for males (aOR = 1.23). Twenty-nine percent of the homicides of male victims and 55 percent of homicides of females occurred in the home or private area around the home. Thus, while adult males more commonly bring firearms into the home (male:female ratio of gun ownership is between 3 and 4 to 1),[39] they are more commonly victimized outside the home. In contrast, females suffer increased risk within their own homes when males bring firearms into the home.

27. While prior case-control studies examined the association between gun ownership and homicide victimization, criminologists Kleck and Hogan conducted a national case-control study in which the outcome of interest was homicide perpetration. Data from their cases came from the U.S. Census Bureau's Survey of State Prison Inmates of 1991 who had committed a homicide as an adult between 1980 and 1991. Controls were taken from the General Social Survey of the U.S. population. They found gun ownership was positively associated with homicide perpetration. After statistically controlling for age, sex, race, Hispanic ethnicity, marital status, personal income, education, military veteran status, and having a child less than 18 years of age, the odds that a gun owner would commit a homicide was 1.36 times higher than the odds of a nongun owner committing a homicide after controlling for confounders.[40] Although the strength of the association between gun ownership and

[39] Violence Policy Center. *The Shrinking Minority: The Continuing Decline of Gun Ownership in America.* Washington, DC, 2011. http://www.vpc.org/studies/ownership.pdf

[40] Kleck G, Hogan M. National case-control Study of homicide offending and gun ownership. *Social Problems* 1999;46:275-293

homicide perpetration risk was lower than was observed in the case-control studies of homicide victimization, the direction of the association was consistent with the other studies.

Cohort Studies

28. Wintemute's study of the mortality risks of a cohort of legal handgun purchasers in California relative to the general population of Californians with the same age and sex distribution examined risks for homicide as well as for suicide. The risk being a victim of homicide with a firearm was twice as high among women handgun purchasers relative to Californian women of the same age, but was lower among men who legally purchased firearms (SMR = 0.8). I suspect that the elevated risk for women was due to the fact that women are more likely to be killed by an intimate partner or family member who might have access to a firearm kept in the woman's home whereas men are more commonly murdered on the street by an acquaintance or stranger.

Aggregate-Level Studies: Cross-Sectional Studies

29. Miller and colleagues conducted a study to assess the cross-sectional association between the prevalence of firearms in the home and homicide rates at the state level. The researchers statistically controlled for differences across states in rates of aggravated assault, robbery, unemployment, urbanization, per capita alcohol consumption, and economic resource deprivation. States with higher rates of household firearm ownership had significantly higher homicide victimization rates for men, women and children. Differences in the prevalence of household firearm ownership were associated with proportionately similar differences in rates of homicide committed with firearms. Consistent with the hypothesis that the positive association between gun ownership and homicide was due to gun availability and not to differences in the propensity for violence between gun owners and people who do not own guns, non-gun homicide victimization was not associated with firearm ownership.[41] In my opinion, this study might understate the cross-sectional relationship between firearm ownership and homicide rates because the statistical models control for crimes that could themselves be caused by higher levels of gun ownership (aggravated assaults and robberies).

[41] Miller M, Hemenway D, Azrael D. State-level homicide victimization rates in the US in relation to survey measures of household firearm ownership, 2001-2003. Social Sciences & Medicine 2007;64:656-64.

These findings were consistent with those of similar prior studies that relied on a surrogate measure of gun ownership rather than direct survey data[42] [43], and a subsequent study using similar data.[44] [45]

30. Miller and colleagues also published studies on the association between gun availability and homicide of children ages 5 – 14 years[46] and homicides of women ages 20 and over.[47] In each case, they report statistically significant positive associations between gun availability and firearm homicide rates at the state-level, but no gun availability effects on non-firearm homicides. It is worth noting that the groups Miller and colleagues studied – children and women – do not typically bring a firearm into the home. Therefore positive associations between gun availability and homicide risks are unlikely to be due to individuals being motivated by their own risk of homicide to acquire a gun.

Aggregate-Level Studies: Longitudinal Studies

31. Longitudinal study designs are generally preferable to cross-sectional studies because they can ascertain temporal relationships between variables. This is important for studying the

---

[42] Miller M, Azrael D, Hemenway D. Rates of household firearm ownership and homicide across US regions and states, 1988-1997. *American Journal of Public Health*. 2002;92:1988-93.

[43] Price, JH, Thompson AJ, Dake JA. Factors associated with state variations in homicide, suicide, and unintentional firearm deaths. *Journal of Community Health*, 2004;29: 271–283.

[44] Gius M. The effect of gun ownership rates on homicide rates: a state-level analysis. *Applied Economics Letters* 2009;16:1687-1690.

[45] Kleck and Patterson analyzed cross-sectional data for 170 U.S. cities with populations of 100,000 or more and report that gun ownership has no impact on homicide (Kleck G, Patterson EB. The impact of gun control and gun ownership levels on violence rates. *Journal of Quantitative Criminology* 1993;9:249-288). To address the concern that cross-sectional associations between gun ownership and homicide could be due to higher homicide rates prompting increased gun ownership for protection, the researchers used a two-stage least squares regression approach to the analyses which involves using an instrumental variable in the first stage to estimate gun ownership levels absent any effects from homicide rates. But this analytic approach is contingent upon the instrumental variable being used to measure gun ownership meeting several conditions that are typically difficult to meet. A detailed criticism of Kleck and Patterson's study correctly points out that Kleck and Patterson failed to provide common statistical tests to confirm that the instrumental variable he used met these conditions. Alba RD, Messner SF. Point Blank and the Evidence: A Rejoinder to Gary Kleck. *Journal of Quantitative Criminology* 1995;11:425-428. Thus, the validity of Kleck and Patterson's findings are unclear.

[46] Miller M, Azrael D, Hemenway D. Firearm availability and unintentional firearm deaths, suicide, and homicide among 5 – 14 year olds. *Journal of Trauma, Injury, Infection, and Critical Care* 2002;52:267-275.

[47] Miller M, Azrael D, Hemenway D. Firearm availability and suicide, homicide, and unintentional firearm deaths among women. *Journal of Urban Health* 2002;79:26-38.

relationship between gun ownership because gun ownership may affect homicide risks and homicide risks can affect firearm acquisition. McDowall examined changes in two proxy measures for gun ownership – the proportion of suicides committed with a firearm and the proportion of robberies committed with a firearm – to study the temporal relationship between firearm availability and homicide rates in Detroit. Using methods to negate reverse causality and statistically controlling for changes in racial composition of the city, the proportion in the high-risk 15-24 year age group, the homicide clearance rate lagged by 1 year, and the robbery rate, gun ownership was positively associated with Detroit's homicide rate. Licenses issued to purchase handguns were also positively associated with homicide rates.[48]

32. In a similar study, Sorenson and Berk examined temporal relationships between handgun sales (lagged one year to avoid concerns of reverse causation) and age-, sex-, and race-specific homicide rates after controlling for racial composition, cohort size, beer sales, unemployment, and migration for the period 1972 – 1993. Lagged handgun sales were positively associated with homicide rates for males of every age group and race/ethnicity; however, they found no relationship between handgun sales and homicide victimization of females.[49]

33. Magaddino and Medoff examined data for the years 1947 – 1977 and found that, while new guns manufactured and imported did not predict homicide rates, the *cumulative* number of handguns available was positively associated with homicide rates.[50] [51] A weakness of studies of this

---

[48] McDowall D. Firearm availability and homicide rates in Detroit, 1951 – 1986. *Social Forces* 1991;69:1085-1101.

[49] Sorenson SB, Berk R. Handgun sales, beer sales, and youth homicide. *Journal of Public Health Policy* 2001;22:182-197.

[50] Magaddino JF, Medoff M. An empirical analysis of federal and state firearm control laws. Pages 225-258 in DB Kates(ed), *Firearms and Violence.* Cambridge, MA: Ballinger, 1984.

[51] Kleck conducted two time-series studies to examine the relationship between guns and homicide rates for the United States as a whole. The first study examined data for 1947 – 1973 and used a commonly used statistical approach (two-stage least-squares regression) to disentangle potentially reciprocal relationships between variables such as homicides and gun sales while controlling for other variables related to both. His findings indicated that increases in the number of guns manufactured or imported into the U.S. predicted higher U.S. homicide rates. In his second study of this type, Kleck extended the data from this first study through 1978, added additional explanatory variables including robbery rates to his statistical models, and used a four-equation simultaneous model. His analyses indicated that increases in the number of guns manufactured or imported did not predict changes in homicides; however, there was a positive association between guns manufactured or imported and homicide rates if robbery rates were not included as an explanatory variable.

type is that the studies aggregate data over the entire United States, ignoring considerable variation at state and local levels in gun sales and homicides.

34. In his book *More Guns, Less Crime*, John Lott, Jr. used state-level data on gun ownership from exit polling data following the 1988 and 1996 presidential elections and reported a negative relationship between gun ownership and homicide rates (suggesting that measured increases in gun ownership led to decreases in homicide rates) over these two time periods.[52] However, the polling data Lott used only included actual voters who represent a non-random minority of the actual adult population. His findings on changes in gun ownership are inconsistent with rigorous surveys designed to accurately reflect conditions across all households that show gun ownership declining from 1988 to 1996 (e.g., the University of Chicago's General Social Survey)[53].

35. In a study examining longitudinal data at the state and county levels, economist Mark Duggan examined the dynamic relationship between gun ownership and crime over the period 1980-1998 using state- and county-level data on a validated proxy for gun ownership. To avoid the potential for reverse causality (higher homicide rates prompting higher rates of gun ownership), Duggan examines the relationship between gun ownership lagged by one year (t – 1) with homicide rates. Data from this study demonstrate that changes in gun ownership were positively related to changes in homicide rates. As with other studies, the gun ownership-homicide relationship is due entirely to gun ownership's effects on homicides committed with firearms. Gun ownership does not predict rates of homicides committed without firearms. This pattern of findings was the same for analyses done at the state level and at the county level. Duggan estimates that a third of the dramatic

---

Kleck's findings have little relevance to the question of the relationship between the availability of firearms and homicide rates because changes in the number of guns manufactured or imported in a given year should have little effect on the prevalence of firearms within homes. It could take years for many of those guns to be sold and when they are sold, divergent trends in gun sales, which are going up, and the prevalence of gun ownership, which is going down, suggest that they are most commonly sold to people who already own guns (Violence Policy Center. *The Shrinking Minority: The Continuing Decline of Gun Ownership in America*. http://www.vpc.org/studies/ownership.pdf).

[52] Lott, John Jr. *More Guns, Less Crime: Understanding Crime and Gun Control Laws*. Second edition. Chicago: University of Chicago Press, 2000.

[53] Smith, TW. Public Attitudes towards the Regulation of Firearms. National Opinion Research Center, University of Chicago, May 2007.

reductions in firearm homicide rates relative to changes in nonfirearm homicide rates which occurred from 1993 to 1998 could be attributed to declines in the fraction of homes with firearms. [54]

36. Noted economists and experts on gun policy, Philip Cook and Jens Ludwig, analyzed 20 years of state- and county-level data and also find a significant positive association between gun availability and homicides with the relationship being exclusive to homicides committed with a firearm. They estimate elasticities (the percentage change in homicides for every one percent change in gun ownership) of +.1 to +.3 between gun ownership and homicides.[55]

C. Gun Availability and Deaths from Unintentional Shootings. Household Studies

37. To my knowledge, there has been only one study which has examined the relationship between firearms in the home and the risk of unintentional firearm deaths. In this study, Wiebe used data from a nationally representative survey – the 1993 National Mortality Followback Survey and 1994 National Health Interview Study (NHIS) – and a case-control study design to assess the association between the presence of firearms in the home and risks of death from an unintentional shooting. Cases consisted of 84 persons killed as a result of an unintentional shooting. Each case was matched with up to 20 controls from the NHIS matched by sex, age group, race, and region of residence and the analyses statistically controlled for any differences between the cases and controls with respect to marital status, education level, and annual family income. The risk of an unintentional shooting death was 3.7 times higher within homes with any firearm. Elevated risks were greatest, more than a fivefold increase in risk for unintentional shooting death (RR = 5.3), in homes that kept only handguns.[56] Keeping only handguns and not long guns, should be more likely to be the case for gun owners in urban settings such as San Francisco.

---

[54] Duggan M. More guns, more crime. *The Journal of Political Economy* 2001;109:1086-1114.

[55] Cook PJ, Ludwig J. "The social costs of gun ownership." *Journal of Public Economics*. 2006; 90: 379-391.

[56] Wiebe DJ. Firearms in US homes as a risk factor for unintentional gunshot fatality. . *Accident Analysis and Prevention*. 2003;35:711-716.

Aggregate-Level Studies

38. I found only one aggregate-level study designed to assess the relationship between firearm availability and the risk of death from an unintentional shooting. Miller and colleagues (2001) studied the association between a state's rate of deaths due to unintentional shootings and the prevalence of firearms. They found a very strong positive relationship between measures of firearm availability and the rate of deaths from unintentional shootings. This positive relationship was strongest for young children and teens.[57]

II. LOCKED STORAGE OF FIREARMS REDUCES THE RISK OF SUICIDE, HOMICIDE, AND DEATHS FROM UNINTENTIONAL SHOOTINGS.

39. It is my opinion that keeping firearms locked up or locked with a trigger guard reduces the risks associated with keeping firearms in the home. In the following paragraphs, I describe the research that supports my opinion.

40. Data from Kellermann et al.'s study of risk factors for suicide within the home suggest that safe gun storage practices reduce the risk of suicide within the home. The adjusted odds ratios contrasting risks compared with similar households with no firearms clearly show a progression of increasing risk with increasing ease of access – all guns locked up (aOR = 2.4), all guns stored unloaded (aOR = 3.3), any gun left unlocked (aOR = 5.6), and any gun kept loaded (aOR = 9.2) the condition under which guns would be most readily available for misuse. Thus the storage condition which increased suicide risks the least above that of having no firearm in the home was storing all guns locked up as is directed by the San Francisco ordinance in question.

41. Safe storage of firearms is likely to be particularly important for protecting teens from killing themselves or others. Groups as diverse as the National Rifle Association and the American Academy of Pediatrics recommend that gun owners store their guns so that they are inaccessible to unauthorized persons including children and teens.[58] [59],

---

[57] Miller M, Azrael D, et al. Firearm availability and unintentional firearm deaths. *Accident Analysis and Prevention* 2001;33:477-484.

[58] National Rifle Association. NRA Gun Safety Rules. http://www.nrahq.org/education/guide.asp. Accessed August 3, 2011.

[59] American Academy of Pediatrics. Safety and Prevention: Gun Safety: Keeping Children Safe. http://www.healthychildren.org/English/safety-prevention/all-around/Pages/Gun-Safety-Keeping-Children-Safe.aspx. Accessed August 3, 2011.

42. Grossman and colleagues conducted a case-control study to assess the relationship between firearm storage practices and adolescents' risk of suicide and unintentional shootings. They collected data for cases from households where a youth less than 18 years of age was killed as a result of a suicide or unintentional shooting and examined these deaths in 37 counties in the states of Washington, Oregon, and Missouri in addition to nonfatal self-inflicted or unintentional shooting victims treated at trauma centers in Seattle, Spokane, and Tacoma, Washington and Kansas City, Missouri. Cases included 82 self-inflicted shootings (95% of which were fatal) and 24 unintentional shootings (50% of which were fatal). Controls were identified through random surveys of the counties where the cases were drawn and consisted of households where at least one firearm was kept in or near (e.g., garage) the home. Data from this study indicate that the risk of self-inflicted and unintentional firearm injuries was about 70 percent lower in gun-owning homes where firearms were stored locked up and unloaded compared with homes where guns were not stored locked up and unloaded. The relationship between gun storage practices and firearm deaths to adolescents was similar for suicide and unintentional shootings.[60]

43. Using data from statewide surveys of health and safety practices conducted by the Centers for Disease Control and Prevention, which included questions about firearm ownership and storage practices, Miller and colleagues conducted a state-level study to assess the relationship between firearm storage and rates of death from unintentional shootings. Controlling for the prevalence of guns in the home as well as urbanization and poverty levels, states in which it was less common to store firearms unlocked and unloaded had significantly lower rates of unintentional firearm deaths. The researchers contrasted data between the six states with the highest percentage of individuals living in households with loaded firearms with the ten states where this practice was most common. Although the six states with the highest prevalence of exposure to loaded firearms within the home had less than half as many people and fewer people exposed to firearms than was the case with the 10 states with the lowest percentage in homes with a loaded firearm, there were more than twice as

[60] Grossman DC, Mueller BA, Riedy C, Dowd MD, Villaveces A, Prodzinski J, Nakagawara J, Howard J, Thiersch N, Harruff R. Gun storage practices and risk of youth suicide and unintentional firearm injuries. *Journal of the American Medical Association.* 2005 Feb 9;293(6):707-14.

many unintentional shooting deaths to youth under age 18 years than in the ten states where living in a home with a loaded firearm was least common.[61]

44. Other than Kellermann et al.'s study connecting increasing ease of access to guns with increasingly elevated risk of suicide among adults and showing that keeping all guns locked up attenuated the increased risk more than other storage options, no other study specifically examined the relationship between firearm storage and reduced risks of suicide, homicide, and unintentional shootings among adults. Nonetheless, it is reasonable to believe that a protective effect from locked storage would be found in any instance of firearm violence that is impulsive or spontaneous. California's CAP law covers youth under age 18, but San Francisco's safe storage requirements which extend to all adults should have some protective effects, especially for youth ages 18-24 where prior studies have shown substantial increased suicide risks associated with access to firearms. Many young adults live in homes with parents or with other adults who may own guns. Requirements to store firearms locked up should be protective to young adults in these situations.

III. POLICIES THAT REDUCE THE AVAILABILITY OF FIREARMS REDUCE FIREARM-RELATED MORTALITY.

45. It is my opinion that policies that reduce the availability of firearms reduce firearm-related mortality. In the following paragraphs, I describe the research that supports my opinion.

46. In the United States, most gun control laws are not overly restrictive with respect to the eligibility to legally purchase and possess firearms and have numerous loopholes which can diminish the ability of the laws to keep guns from prohibited individuals. As such, most U.S. gun control laws have minimal impact on the gun ownership. The most restrictive and rigorous gun control laws are permit-to-purchase licensing laws which allow law enforcement agencies (usually local agencies) issuing permits to purchase firearms to use their discretion in issuing these permits. These states also have some of the most stringent nondiscretionary requirements for issuing permits to purchase firearms. These three states have among the lowest rates of household gun ownership.

[61] Miller M, Azrael D, Hemenway D, Vrinitotis M. Firearm storage practices and rates of unintentional firearm deaths in the United States. *Accident Analysis & Prevention* 2005;661-667.

47. The data in the table below contrast these three states' firearm ownership and age-adjusted suicide rates among non-Hispanic Whites with that of the nation as a whole. Thus, the data presented control for three demographic factors associated with suicide rates – age, race, and ethnicity. The data indicate that the prevalence of firearms within homes is less than half as high as the national average and suicide rates for non-Hispanic White were 39% to 51% lower than the national average. The two right-hand columns present data on homicide rates for non-Hispanic whites and Blacks in large central metro counties where violent crime tends to be highest and therefore the availability of firearms most critical. For non-Hispanic Whites, homicide rates in these three states with low gun prevalence were 33% to 42% lower than for the nation overall. For Blacks, homicide rates were 8% to 45% lower than the national average. Though these data do not prove that policies which reduced the prevalence of firearms in homes led to fewer suicides and homicides, it is consistent with that thesis.

Table 1. Prevalence of household firearm ownership (2001), statewide age-adjusted suicide rates, and age-adjusted homicide rates for large central metro counties (2002 - 2004) for selected demographic groups in the three states with the most restrictive laws pertaining to permits to purchase a handgun by allowing local law enforcement discretion in issuing permits in comparison to U.S. totals.

	household gun prevalence, 2001 %	age-adjusted suicide rates – non-Hispanic Whites, 2002-2004[i]	age-adjusted homicide rates – non-Hispanic Whites, 2002-2004[i]	age-adjusted homicide rates – Blacks, 2002-2004[i]
New York	18.0	7.6	2.2	15.1
New Jersey	12.3	6.3	2.5	25.5
Massachusetts	12.6	7.3	1.9	18.7
United States	31.7	12.8	3.3	27.6

[i] per 100,000 population per year

48. A recent study more formally examines the relationship between different types of gun policies and state's suicide rates from 1995 through 2004. The study statistically controls for differences in educational attainment, income, alcohol consumption, proportion of the population over age 65, and the proportion of the population that in non-Hispanic and white. Some models control for the popularity of sports shooting by using hunting licenses per capita as a covariate in the regression models. The study found that permit-to-purchase licensing and bans on minors purchasing firearms –

policies likely to reduce population-level gun availability – were negatively associated with suicide rates.[62]

49. In 1997, Austria adapted its firearms laws by adding several new regulations and restrictions. Individuals seeking to obtain a firearm had to specify a reason, and the legal criteria for obtaining a category B weapon (handguns, semi-automatic firearms or repeating firearms) for the first time would include psychological testing, being at least 21 years of age, and passing a background check. Particularly relevant to the San Francisco ordinance, the new law mandated safe storage of firearms and a three-day waiting period for long gun acquisitions. An evaluation of Austria's 1997 gun laws found that following the adoption of the law, both firearm suicides and firearm homicides fell sharply as licenses to acquire firearms dropped precipitously. There was no evidence of a significant substitution to other methods of suicide.[63]

50. Between 1996 and 1998, Australia implemented a number of reforms to its gun laws which appreciably affected firearm availability in that country. In addition to banning semi-automatic and pump-action rifles and shotguns with government buybacks, all firearms were required to be registered to their licensed owners, private firearm sales were prohibited, and each gun transfer through a licensed gun dealer would be approved only if police were satisfied that the applicant had genuine and special reason for ownership. An evaluation of the effects of these policies revealed that the new firearms restrictions were associated with significant reductions in homicides and suicides and that there was no evidence of a significant method substitution effect. Prior to these policies going into effect, firearm homicides were trending downward at a rate of 3 percent per year. After the policies were introduced, firearm homicides declined at a rate of 7.5 percent per year. Similarly, firearm suicides had been trending downward prior to the legal changes at a rate of 3 percent per year and the downward trend increased to 7.4 percent per year.[64]

---

[62] Andres AR, Hempsted K. Gun control and suicide: The impact of state firearm regulations in the United States, 1995-2004. *Health Policy* 2010;101:95-103.

[63] Kapusta N, Etzersdorfer E, Krall C, Sonneck G. Firearm legislation reform in the European Union: Impact on firearm availability, firearm suicide and homicide rates in Austria. *British Journal of Psychiatry* 2007;191:253-257.

[64] Chapman S, Alpers P, Agho K, Jones M. Australia's 1996 gun law reforms: faster falls in firearm deaths, firearm suicides, and a decade without mass shootings. *Injury Prevention.* 2006; 12:365-72.

51. In October 2003, Brazil enacted several measures to strengthen the nation's gun control laws including making it illegal for individuals to own guns that are not registered or to carry guns outside of one's home or business, requiring background checks for gun purchases, and raising the minimum age for gun purchase to twenty-five. This legislative effort was followed in July 2004 by a campaign to encourage citizens to voluntarily turn in their firearms which netted 450,000 firearms. An examination of firearm-related mortality and hospitalizations trends revealed that, after many years of steady increases, the policies were associated with a significant decline in firearm-related deaths and hospitalizations.[65]

52. Although some studies that have examined the effects of Canadian gun control laws have found evidence that the laws reduced firearm suicides but not total suicides as a result of substitution to other highly lethal methods,[66] [67], a thorough analysis of long-term suicide trends which accounts for gradual changes in the age structure of the population in Ontario provided strong evidence that a 1978 law led to a significant decline in suicides in the providence that was specific to firearm-related suicides.[68]

53. The findings from these studies reveal a consistent pattern. When governments enact measures to reduce the availability of firearms within their jurisdictions, far fewer people die as a result of suicide and homicide. While these policies go well beyond San Francisco's ordinance requiring handguns kept in a home to be stored in locked containers or with trigger locks, the data demonstrate the connection between gun availability and suicides and homicides. In light of this connection, it is reasonable to believe that reducing the immediate availability of guns, as San Francisco's ordinance does, will also reduce incidents of gun violence.

---

[65] Marinho de Souza Mde F, Macinko J, Alencar AP, Malta DC, de Morais Neto OL. Reductions in firearm-related mortality and hospitalizations in Brazil after gun control. *Health Affair*s. 2007; 26:575-84.

[66] Cheung A, Dewa C. Current trends in youth suicide and firearm regulations. *Canadian Journal of Public Health* 2005;11:77-83.

[67] Lester D, Leenaars A. Suicide rates in Canada before and after tightening firearm control laws. *Psychol. Rep.* 1993;72:787–90.

[68] Carrington PJ, Moyer S. Gun control and suicide in Ontario. *American Journal of Psychiatry* 1994;151:606-608.

54. Recognizing the risks of unsupervised access of firearms to children and teens, 18 states and the District of Columbia have passed laws requiring gun owners to store their firearms in a manner that prevents access to underage youth, typically requiring guns to be stored locked away or with a trigger guard to prevent the gun from firing if handled when locked. In research which I conducted, I found that these so-called child access prevention (CAP) laws are associated with significant reductions in suicides of teens ages 14 – 17 years in the states where they have been adopted.[69] Cummings and colleagues also examined the effects of CAP laws on suicides and found a negative relationship between presence of a CAP law and suicide risks among youth under age 15.[70]

55. There is also evidence that CAP laws intended to required firearm storage which would make firearms either inaccessible or unable to be fired can reduce unintentional shooting deaths of children and teens. Cummings and colleagues conducted the first evaluation of CAP laws and reported that the laws were associated with significant reductions in deaths due to unintentional shootings of youth under age 15. Subsequent research that I conducted with Marc Starnes, as well as a study conducted by Hepburn and colleagues, showed that the effects of CAP laws on unintentional firearm deaths to youth were uneven across states. Reductions were only statistically significant in Florida and California where the laws likely garnered significant publicity.[71] [72,] Florida's law received considerable publicity because it was the first state to pass a CAP law, doing so after a series of highly publicized deaths of children killed in unintentional shootings resulting from underage access to firearms in the home. Florida and California are among the few states where CAP law violators can be charged with a felony crime. The ability for prosecutors to charge CAP law violators with a felony may increase the likelihood of prosecution and increased publicity and awareness of CAP laws.

---

[69] Webster DW, Vernick JS, Zeoli AM, Manganello JA. Effects of youth-focused firearm laws on youth suicides. *Journal of the American Medical Association* 2004; 292:594-601.

[70] Cummings P, Grossman DC, Rivara FP, Koepsell TD. State gun safe storage laws and child mortality due to firearms. *JAMA* 1997;278:1084-1086.

[71] Webster DW, Starnes M. Reexamining the association between child access prevention gun laws and unintentional firearm deaths among children, *Pediatrics*, 2000;106:1466-1469.

[72] Hepburn L, Azrael D, Miller M, Hemenway D. The effect of child access prevention laws on unintentional child firearm fatalities, 1979-2000. *Journal of Trauma* 2006;61:423-428.

56. Research on the effects of CAP laws in the U.S. have appropriately focused on the effects of the laws on underage youth. San Francisco's safe gun storage ordinance extends California's CAP law to all households, regardless of the presence of children or teens, by requiring all handguns to be stored in a locked container or with a trigger lock. In my opinion, it is reasonable to believe that, in light of the relationship between firearm availability and firearm violence discussed throughout this report, the study connecting ease of access to firearms with increased suicide rates, and the problem of gun thefts discussed *infra* in Section IV, requiring locked storage of guns among all households is likely to reduce firearm injuries and deaths. Moreover, San Francisco is particularly justified in enacting this ordinance because U.S. Census data indicate that nearly a third of all households in San Francisco in 2010 included non-family households with adults living with non-family members.[73] In such cases, legal possessors of handguns could be sharing a home with a prohibited person who might be able to easily access and use a handgun that was not locked up.

57. Some have referenced the work of a review panel of the National Research Council to conclude that there is no scientific evidence that gun control works.[74] However, this body reviewed a limited set of studies published before 2004, did not consider all policies such as permit-to-purchase licensing systems, and did not examine evaluations of policies implemented outside of the United States. Thus, most of the studies cited above were not included in the committee's review of the research on the effects of gun control policies.

IV. GREATER FIREARM AVAILABILITY WITHIN HOMES INCREASES THE RISK OF HOME BURGLARIES AND OF GUNS ENTERING THE ILLEGAL MARKET VIA THEFT.

58. It is my opinion that greater firearm availability within homes increases the risk of home burglaries and of guns entering the illegal market via theft. The research supporting my opinion is described in the following paragraphs.

---

[73] U.S. Census Bureau. American Fact Finder. Household Population and Household Type by Tenure: 2010. 2010 Census Summary File, San Francisco, California. Data indicate that 62,416 of 345,811 households involved nonfamily member adults living in the same household.

[74] National Research Council. *Firearms and Violence: A Critical Review.* Committee to Improve Research Information and Data on Firearms. Charles F. Welford, John V. Pepper, and Carol V. Petrie, editors. Committee on Law and Justice, Division of Behavioral and Social Sciences and Education, Washington, DC: The National Academies Press, 2005.

59. Some claim that if more people owned guns there would be a greater deterrent to criminals breaking into homes. However, a careful empirical examination of the data proves that the opposite is true. Economists Phillip Cook and Jens Ludwig analyzed longitudinal burglary data from the Uniform Crime Reports at the state and county levels and cross-sectional data from special restricted-access version of the National Crime Victimization Survey (NCVS) that identified the county in which the survey respondents reside. In the longitudinal analyses they found that a one-year lag of a gun availability proxy (ratio of firearm suicides to all suicides) was positively associated with higher burglary rates with the elasticity of burglaries to gun ownership ranging from around +0.4 to +0.5. Thus, a 10 percent increase in gun ownership would yield a 3 to 7 percent increase in burglary rates. Estimates of the effects of gun ownership on burglaries were very similar in direction and magnitude when the researchers used an instrumental variable for gun ownership rather than the gun suicide proxy.[75]

60. A limitation to these analyses is that commercial burglaries are lumped together with residential burglaries in the UCR data. Cook and Ludwig's cross-sectional analyses of NCVS data reveal a strikingly similar positive association between a county's prevalence of gun ownership and the probability that a household reported a home burglary after controlling for characteristics of the household and county. The study also found that, contrary to the view that gun ownership reduces the likelihood that a home is burglarized while someone is at home, there was no statistically significant relationship between county-level gun ownership and the probability that someone was at home during a burglary attempt. The authors argue that the presence of firearms in homes represents attractive loot for criminals, thus providing increased incentives for home burglaries which appear to outweigh the deterrent effects resulting from fears of being shot by a home occupant.

61. Data from a nationally-representative survey conducted in the 1990s suggest that as many as 500,000 firearms are stolen each year from U.S. citizens.[76] A nationally-representative survey

---

[75] Cook PJ, Ludwig J. "The Effects of Gun Prevalence on Burglary: Deterrence vs. Inducement." Pages 74-120 in *Evaluating Gun Policy*. Jens Ludwig and Philip J. Cook, (eds). Washington, DC: Brookings, 2003.

[76] Cook PJ, Ludwig J. *Guns in America: Results of a Comprehensive Survey of Gun Ownership and Use*. Washington, DC: Police Foundation, 1996.

of inmates at state prisons from 1997 revealed that 10 percent of firearm offenders had obtained the weapon they had used in crime through theft and another eight percent obtained their gun through a fence or black market source and presumably many of these guns had be stolen from homes.[77] A more recent study which I conducted used a more recent (2004) survey of prison inmates and revealed very similar findings on the role of theft and street sources in directly supplying criminal offenders with guns.[78] Thus the findings from Cook and Ludwig's study of the relationship between gun ownership and burglaries suggest that San Francisco's current requirements for gun owners to store firearms in the home in a locked container or with a trigger lock would reduce the number of guns available to criminals obtained directly or indirectly through home thefts. Moreover, to the extent that would-be burglars anticipate that firearms will be locked and difficult for them to access, Cook and Ludwig's study suggests that the reduction in this attractive loot may, in turn, reduce the number of burglaries.

V. THERE IS NO RESEARCH THAT SUPPORTS THE NOTION THAT STORING UNLOCKED GUNS IN HOMES MAKES OCCUPANTS SAFER.

62. The notion that citizens use guns in self-defense far more commonly than they are victimized by someone with a gun was supported by data from a national survey directed by criminologist Gary Kleck. Kleck and Gertz conducted a national phone survey of 4,977 adults. Fifty-six (1.1%) respondents reported having used defensively used a gun within the past 12 months in situations in which they report being the would-be victim of a crime. The data were used to make a projection that 2.5 million times per year a U.S. citizen used a firearm defensively in situations when someone was committing or attempting to commit a crime.[79] The projections from this survey are discordant with data from other sources of data relevant to crime and violence, Aside from the fact that the number of defensive gun uses from Kleck and Gertz is 22 times higher than what was estimated from the National Crime Victimization Survey (NCVS), Kleck and Gertz's data fail tests of external

---

[77] Harlow CW. *Firearm Use by Offenders: Survey of Inmates in State and Federal Correctional Facilities.* Special Report from the U.S. Bureau of Justice Statistics, U.S. Department of Justice, Washington, DC, November 2001.

[78] Vittes KA, Vernick JS, Webster DW. Legal status and source of offenders' firearms in states with the least stringent criteria for gun ownership. *Injury Prevention* 2012; Epub.

[79] Kleck G, Gertz M. Armed resistance to crime: the prevalence and nature of self-defense with a gun. *Journal of Criminal Law and Criminology* 1995;86:150-187.

validity. For example, Kleck and Gertz data indicate that there are over 200,000 assailants who are wounded by civilians defending themselves against crime each year, yet a national surveillance system for hospital emergency department visits indicate that fewer than 100,000 people are treated for gunshot wounds annually in the United States. Subsequent surveys conducted by Hemenway and colleagues were designed to measure all civilian uses of guns, hostile or aggressive as well as defensive. Their data indicate that, despite a likely bias toward reporting defensive uses of guns that would be viewed favorably and against admitting acts that were criminal behavior, survey respondents more frequently admitted to engaging in aggressive or hostile uses of guns than they did defensive uses of guns. Furthermore, many of the so-called defensive uses are of questionable legality due to inadequate justification for using deadly force.[80] This finding is far more consistent with the research showing that greater gun availability tends to be associated with higher rates of homicide.

63. No prior study of civilian defensive gun use has examined questions most directly relevant to San Francisco's law mandating that firearms in the home be stored in locked containers or with trigger locks.

VI. CONCLUSION

64. San Francisco's safe gun storage ordinance, by limiting the accessibility of firearms to unauthorized users, is likely to benefit public safety by reducing violent deaths within the home and reducing the number of guns obtained by criminals through theft.

65. Prior research demonstrates that reducing the availability of firearms in the home, especially reduced availability for unauthorized users such as children and adolescents, decreases the risk for suicide, homicide, and deaths from unintentional shootings. Risks of violent death within the home of gun owners are reduced by safe storage practices such as locking up guns. Such storage practices would reduce availability of operable firearms available to an unauthorized household member when he or she becomes distraught, suicidal, angry, or otherwise lose control of his or her emotions and thus lead to fewer tragic deaths. Furthermore, the law should reduce the number of guns which are stolen and then enter the illegal market.

---

[80] Hemenway D, Azrael D, Miller M. Gun use in the United States: Results from two national surveys. *Injury Prevention* 2000;6:263-267.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 13th day of September, 2012, in Baltimore, Maryland.

DANIEL W. WEBSTER