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Keywords

firearms, mental health, suicide

Disciplines

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Mental health and firearms in community-based surveys:
Implications for suicide prevention

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Abstract

Suicide rates are higher among those who own a handgun and among those who live in a household with a handgun. The present investigation examined the association between gun ownership and mental health, another risk factor for suicide. Data from the General Social Survey, a series of surveys of U.S. adults, were analyzed to compare general emotional and mental health, sadness and depression, functional mental health, and mental health help seeking among gun owners, persons who do not own their own gun but reside in a household with a gun, and those who do not own a gun. After taking into account a few basic demographic characteristics associated with both variables, there appears to be no association between mental health and gun ownership. Nor is there any association between mental health and living in a household with a firearm. Findings suggest that the high risk of suicide among those who own or live in a household with a gun is not related to poor mental health. Implications for prevention are discussed.

Introduction

Are gun owners more mentally and emotionally disturbed than people who do not own guns? Although such a question may be inherently offensive to some, there is a reasonable basis for posing it: Suicide rates are higher among those with a mental disorder, and, compared to the general population, handgun owners have substantially higher rates of suicide. In addition, the increased risk of suicide appears to extend to other members of a household that contains a handgun.

To our knowledge, the mental health of persons who own a gun and persons who reside in a household with a gun but who do not own a gun themselves has not been studied in the U.S.¹ In the present investigation, we examined mental disorder and distress as they relate to firearm exposure in order to test whether persons who have a gun have higher rates of mental disorder or distress. Two levels of firearm exposure were examined: personal ownership and household, but not personal, possession.²

Background

Discussions about guns and gun violence in the U.S. typically focus on crime and homicide. Neglected is the most common type of death by firearms, suicide. In 2005, the most recent year for which U.S. data are available, there were 17,002 suicides with a firearm compared to 12,352 homicides with a firearm (Centers for Disease Control and Prevention 2004). Poisoning is the most common means used in suicide attempts but is far less likely to result in death than the use of a firearm (Miller et al. 2004). And more than three-fourths of suicide attempts with a firearm are gunshot wounds to the head (Beaman et al. 2000). Thus, it is not particularly surprising that 76.6% of all suicide attempts with a firearm are fatal (Beaman et al. 2000).

As with homicide, rates of suicide are higher in locales with more guns (Miller et al. 2002). The association holds across multiple population groups - men and women, adults, adolescents, and children. The basis for the discrepancy may be related to the availability of the means (e.g., firearms), characteristics of the locale (e.g., geographic region) or the demographic or other characteristics of the people who populate those locales. Moreover, independent of age, unemployment, poverty, per capita alcohol consumption and region of the country, decreases in household firearm ownership over time are associated with decreased rates of suicide (Miller et al. 2006b). Ecological study designs such as those of the research cited here can be useful but they are not able to address issues related to individual-level characteristics.

Research in which the individual is the unit of analysis is hampered by the lack of good measures of firearm ownership and availability. Although a federal background check is required of the purchaser of each firearm in the U.S., gun purchases are not part of – in fact, they are prohibited from being recorded and maintained in - a national database (Consolidated Appropriations Act of 2004). Other ways of assessing firearm prevalence, such as Switzerland's annual inspection procedures,³ are not feasible due to privacy and civil liberties considerations as well as the practical matter of conducting a door-to-door inspection of households. Therefore, most studies, including the present investigation, rely on self report, which, with some limits, has been shown to be a fairly reliable method of obtaining information about firearms (Kellermann et al. 1990, Rafferty et al. 1995).

To our knowledge, only one study using administrative records of handgun sales has examined the association between handguns and suicide (Wintemute et al. 1999). Findings indicate that persons who purchase a handgun are at substantially elevated risk of suicide. Risk is extremely high in the first week after purchase – 57 times that of the adjusted rate for the

general population. Risk decreases but is maintained over time, and the magnitude of the risk is not trivial. During the first year after purchase, suicide is the leading cause of death among handgun purchasers, accounting for 24.5% of all of their deaths. The increased risk of suicide is attributable entirely to the elevated risk of suicide with a firearm (Standardized Mortality Ratio⁴ [SMR] = 7.12). Moreover, handgun purchasers remained at higher risk of suicide than the general population for six years, the entire follow-up period of the study.

Although women are less likely than men to purchase a handgun (Cook and Ludwig 1997), women who purchase a handgun are at particular risk of suicide (Wintemute et al. 1999). Among 21- to 44-year old women who purchased a handgun, in the subsequent year, over half (51.9%) of their deaths were due to suicide. Suicide mortality over the six-year study period was elevated for both men and women who purchased a handgun (vs. the general population), with the mortality risk of women purchasers more than three times that of male purchasers (SMR = 6.83 and 1.98, respectively). The gender discrepancy in mortality risk for suicide with a firearm was even greater (SMR = 15.50 and 3.23, respectively). Elevated suicide risk for handgun purchasers of all age groups was observed at one and six years post-purchase as well. Whether demographic characteristics in addition to gender and age are associated with risk of suicide among handgun purchasers has not been examined.

These findings raise the question of the mental health of handgun purchasers. A long-established literature indicates that rates of suicide are higher among persons with mental disorder (for a review see Harris and Barraclough 1997), and society has acted to keep firearms out of the hands of those it deems unsuitable for such a responsibility. The Omnibus Crime Control and Safe Streets Act of June 1968 and the Gun Control Act of 1968 prohibit a variety of individuals from receiving, possessing, and purchasing a firearm. The laws specified that a

prohibited person includes, among others, a person who has been "adjudged by a court...of being mentally incompetent" and who has been "adjudicated as a mental defective or has been committed to any mental institution." (The latter descriptor remains in federal law and has been used in the laws of several states as well.) Recent Congressional action has allocated funding so that documented problems with implementation of the law (e.g., Simpson 2007) can be addressed, including automating and reporting to the federal government records of those who have been adjudicated as mentally defective or committed to a mental institution so that they can be taken into account when the federally-mandated background checks on firearm purchasers are performed (The NICS Improvement Act 2007).

One need not personally own a gun to have access to it; about one-third of U.S. households contain a firearm (Okoro et al. 2005). A firearm is stored in an easily accessible manner, that is, loaded and unlocked in the homes of nearly 1.7 million children under the age of 18 years. Those under the age of 18, although generally prohibited from purchasing a firearm, are at higher risk than others of using a firearm to kill themselves or someone else (Sorenson and Berk 1999). Thus, it is not surprising that elevated suicide risk appears to extend beyond handgun owners themselves to include other members of households that contain handguns (Cummings et al. 1997, Dahlberg et al. 2004, Kellermann et al. 1992, Kung et al. 2003, Wiebe 2003). As with individual owners, the risk of suicide among those residing in a home with a firearm remains elevated for years (Cummings et al. 1997).

METHODS

Sample

Often referred to as the "gold-standard" of survey research, the General Social Survey (GSS) measures a range of attributes, attitudes, and behaviors of a national probability sample of

non-institutionalized adults living in households in the U.S. The GSS has been conducted by the National Opinion Research Center of the University of Chicago regularly since 1972. Most GSS interviews are administered in person, take an average of 90 minutes to complete, and, with the exception of the 2006 survey when Spanish-speakers were added, are conducted in English.

Questions about firearm ownership and mental health were asked in the 1991, 1996, 1998, 2000, 2002, 2004, and 2006 administrations of the GSS. The sample sizes for these seven surveys ranged from 1,517 to 4,510; the average response rate was 73% (Davis et al. 2007). A random subset of respondents in these survey administrations was asked about firearms and mental health. The subsetting of the full sample for specific content modules resulted in sample sizes used in analysis reported herein ranging from 197 to 858 over the seven administrations of the survey.

Measures

The GSS contains a core set of questions that is asked of every respondent each time the survey is conducted. The questions have remained fairly consistent over the years and include questions about the demographic characteristics of the respondents.

Also asked with regularity are questions about firearm ownership. Respondents are asked, “Do you happen to have in your home (IF HOUSE: or garage) any guns or revolvers?” “(If yes) Is it a pistol, shotgun, rifle, or what? (Code all that apply)” and, “Do any of these guns personally belong to you?” (Davis et al. 2007). Refusal rates for the firearm questions were low, ranging from 0.06%-0.83%.

We next identified all mental health related questions that have been asked on GSS surveys since 1990 and grouped them into four constructs: 1) General emotional and mental health (“Have you ever felt you had a mental problem?”, “Have you ever felt you were going to

have a nervous breakdown?”, “[F]or how many days during the past 30 days was your mental health not good?”); 2) Mental health help seeking ([In the past year, have you undergone] “counseling for a mental or emotional problem?”); 3) Functional mental health (“During the past four weeks, have you had any of the following problems with your work or other daily activities as a result of any emotional problems...” “accomplished less than you would like?”, “didn’t do work or other activities as carefully as usual?”); and 4) Sadness and depression (“For each of the following, please indicate how well the description applies to you... A person who feels sad and blue?”, “How much of the time during the past 4 weeks have you felt downhearted and blue?”).

In addition to these individual recurring questions about mental health, the 1996 and 1998 administrations of the GSS contained questions from previously validated scales designed to assess emotional health. Delivered to about half of the 1996 sample, the GSS emotions module asked about the frequency with which respondents experienced a wide range of emotions including depression, the content of interest herein. Using seven items from the module (i.e., "On how many days in the past 7 days have you felt:" "sad," "lonely," "happy" (reverse coded), "anxious and tense," "fearful about something that might happen to you," "you couldn't shake the blues," and "so restless that you couldn't sit long in a chair?"), we employed a modified version of the Center for Epidemiologic Studies-Depression (CES-D) scale to measure depression among respondents (Radloff 1977, Schieman et al. 2001). Scores ranged from 0 (not at all depressed) to 49 (extremely depressed), with a score of 16 or higher indicating the presence of depression. The 1998 GSS contained the six items that comprise the K-6 scale of serious psychological distress (Cairney et al. 2007, Kessler et al. 2002). Respondents were asked: "In the past 30 days, how often did you feel:" "so sad nothing could cheer you up," "nervous," "restless or fidgety," "hopeless," "that everything was an effort," and "worthless?" Response options ranged from 0

(none of the time) to 4 (all of the time). Overall scores ranged from 0 to 24, with a score of 13 or higher indicating serious psychological distress.

Five of the twelve mental health measures had binary (i.e., yes vs. no) response choices. To facilitate comparison across questions and to assess whether the groups differ on the extremes of mental health, we constructed two binary variables – one indicating excellent mental health and one indicating poor mental health – for each of the seven remaining questions that used continuous or ordinal measures. For example, a score of 0 on the modified CES-D scale was coded as “excellent” mental health (i.e., not depressed) and a score of 16 or higher as “poor” mental health (i.e., depressed). This approach was chosen because we were interested in the extremes, that is, those who were most depressed and disordered and perhaps most at risk for attempting suicide, rather than the central tendency of the two groups. The percentage scoring above or below established cut-points indicating psychopathology on normed measures, the CES-D and K-6, also are reported.

Analysis

We began with simple descriptive statistics. Cross-tabulations were calculated to examine the bivariate relationship between personal firearm ownership and each identified mental health measure and between household firearm ownership and each mental health measure.

The literature consistently documents demographic variables associated with both guns and mental health, for example, gender, in which women are less likely to report firearm ownership and more likely to report mental health symptoms than do men. Therefore, to reduce potential confounding, simple descriptive statistics were followed by multivariate logistic regressions that took into consideration a few key variables. Logistic regression was used

because the outcome is binary, because of the need to take into account several covariates, and because the output from logistic regression is relatively easy to interpret. Had other forms of binomial regression had been used (e.g., a probit model), the results effectively would have been the same.

Mental health and demographic variables were used to predict personal gun ownership and to predict household (but not personal) ownership. Given that the sequential order of the variables could not be ascertained in the cross-sectional GSS data, we also tested the converse, namely, the possibility that gun ownership influenced mental health. In addition, we examined these issues for gun ownership in general and specifically for handgun ownership.

In all analyses, data were weighted to account for non-response and the number of adults in each household. A Bonferroni correction was applied to account for multiple tests in the logistic regressions; variables were considered statistically significant at $p < .005$.

RESULTS

Since 1991, about one fifth (22.9%) of U.S. adults reported having their own firearm and 18.0% reported that they do not have their own but live in a home that contains a firearm. The general trend for both was downward: personal ownership of a firearm ranged from 25.8% in 1991 to 20.7% in 2006, and household, but not personal, ownership ranged from 16.2% in 1991 to 10.2% in 2000. The prevalence of households that contained a firearm also dropped, ranging from 44.2% in 1991 to 34.7% in 2000.

Bivariate analyses indicate some mental health differences between respondents who do and those who do not report having a gun of their own (Table 1). However, such differences do not follow a clear pattern; individuals with their own gun were less likely to report mental health problems in some cases and more likely to report such problems in others. For example, a lower

percentage (18.0%) of respondents with their own gun reported ever feeling like they were going to have a nervous breakdown compared with about one-quarter (25.3%) of respondents who did not have their own gun. On the other hand, compared with about one in ten (9.7%) individuals who did not have their own gun, a higher percentage (16.5%) of those with their own gun said they accomplished less than they would have liked due to emotional or mental problems during the previous month. Tests of significance were not conducted in an effort not to give undue emphasis to relatively small differences, particularly when documented covariates were not taken into account.

Insert Table 1 about here

After taking into account potential confounders (e.g., gender, ethnicity) there was no significant association between personal gun ownership and any of the measures of mental health (Table 2). Given the cross-sectional nature of the data, the direction of the effect could not be determined, that is, we could not determine whether mental health affects gun ownership or gun ownership affects mental health. To assess the latter as well, the ownership and demographic variables were used to predict the mental health variables. And, again, no significant findings emerged (data not tabled). These findings – mental health does not predict gun ownership and gun ownership does not predict mental health – held for each measure of general emotional and mental health, sadness and depression, functional mental health, and mental health help seeking.

Insert Table 2 about here

Turning to individuals who reported living in a home with a gun but who do not have their own gun, we observed the same overall pattern of findings. With rare exception, bivariate analyses indicated that individuals living in a home with a gun report the same or better mental health than those not living in a home with a gun (Table 3), and multivariate analyses indicated that the groups did not differ on the mental health measures (see Table 4). Only one mental health measure was statistically significant after taking into account demographic characteristics of the respondents: individuals who said (vs. did not say) they accomplished less than they would have liked during the previous 4 weeks due to emotional problems had a significantly lower odds (AOR=0.31; CI: 0.10, 0.99) of living in a home with, but not themselves having, a gun. We next examined the order effect (i.e., whether gun ownership predicted mental health) and found no statistically significant associations between household gun possession and mental health measures except for accomplishing less than one would like due to emotional problems (i.e., functional mental health).

Insert Table 3 about here

Insert Table 4 about here

Because handguns are more commonly used in suicides than are rifles or shotguns (e.g., Hargarten et al. 1996), the analyses reported herein were repeated using handgun ownership (yes-no) and living in a household that contains a handgun but not having one's own handgun (yes-no). The resulting smaller sample size resulted in wider confidence intervals, and the lack

of differences between those exposed and those not exposed to a firearm was observed again.

Discussion

Population-based surveys indicate that gun owners and persons residing with gun owners are not more distressed or disordered than those who do not have a gun or do not live with someone who owns a gun. The mental health measures employed in the surveys cited herein are limited to a few questions and research using more sophisticated survey measures or clinical interviews might conclude otherwise. Moreover, unlike the cross-sectional data used in this study, longitudinal research may find that the acquisition of a firearm changes mental health. At this point, however, the available data suggest that those who (vs. those who do not) report that they own or reside with someone who owns a gun differ little in their rates of distress and mental disorder.

Nonetheless, suicide risk remains higher among gun owners and among those who live in a home with a gun. Community-based studies document that, after taking into account mental disorder, suicide risk is increased four to five times by having a gun in the home (Brent et al. 1993a, Kellermann et al. 1992). The increased risk is even higher - nearly 30-fold - for those with no apparent psychopathology (Brent et al. 1993b, Kellermann et al. 1992). These results suggest that the substantial increase in risk may be due, in no small part, to a substantial increase in the risk of impulsive suicide.

Transient personal crises can create considerable emotional distress. These sporadic events are common precursors to suicide and suicide attempts, particularly after recent alcohol consumption (Powell et al. 2001). In a study of people who had made a near-lethal suicide attempt, one-fourth reported spending less than five minutes between the decision to attempt and the actual attempt (Simon et al. 2001). Contrary to widely-held opinion, people who make a

serious attempt that does not result in death generally do not go on to kill themselves another way. (For a review and new data, see Miller et al. 2006a.) Firearm owners' access to a firearm may increase the risk of a completion.

Thus, perhaps impulse control, rather than mental disorder and distress, is a key distinguishing psychological difference between those who do and do not own a gun. If gun owners have lower impulse control and if impulse control is transmitted genetically or through the social environmental, then it may also explain the higher suicide rates among those who reside with firearm owners but do not own a gun themselves. Alternatively, there may be something about firearm owners and their circumstances that makes them more resolute such that when they attempt suicide they have stronger intent (than non-owners) to kill themselves and, thus, choose the highly lethal means of a firearm. Perhaps these same qualities and qualifications apply to those who do not personally own a gun but live with gun owners. Further research will be needed to explore these and other possibilities.

Prevention implications

Psychiatrists and others who work with psychiatrically disordered individuals often recommend that firearms be removed from the home of a severely depressed individual. Some research suggests that this advice is largely ignored: in a clinical trial with depressed adolescents, only 26.9% of the gun-owning families removed the firearms and those who retained their guns were more likely to store them loaded (Brent et al. 2000). Counseling gun owning parents to store their firearms more securely (e.g., locked and unloaded) may be more effective (Kruesi et al. 1999). However, in the clinical trial, 17.1% of the households that initially did not have guns acquired one or more firearms during the two-year study.

Current policies about firearm ownership and possession are based largely on the

assumption that we can identify and screen out individuals who should not have a gun, that is, those who can not behave legally and responsibly. Such an approach may be accurate for those at the extremes, that is, those who have committed crimes and are at risk of committing subsequent violent crime (Wintemute et al. 2001) or those who have become so psychiatrically disabled that the courts have intervened. These benchmarks, although subject to a range of processes that can be inconsistent and discriminatory, are used to draw a standard about firearm ownership and possession. Impulsivity and other such personal tendencies generally do not rise to the level of a diagnosable mental disorder that necessitates court intervention. If, as current research suggests, firearm owners and those who reside with them are more likely to kill themselves and they do not differ in terms of their mental health, the standard merits reconsideration.

Some states have a waiting period between the application to purchase a gun and its approval. (The federal government had such a waiting period until the Brady Bill created and implemented the National Instant Check System.) Waiting periods typically are of a few days duration and, in addition to providing authorities time to check the applicant's criminal and other records, are commonly perceived as a cooling off period. Research findings about the effect of the waiting period on suicide rates appear to be equivocal (Ludwig and Cook 2000, Wintemute 2000). Such findings are not necessarily surprising given the recurrent nature of life crises (e.g., health problems, difficulty in relationships, financial problems): A waiting period may help carry a gun purchaser through a specific crisis but not subsequent ones.

One may reasonably suspect that suicide risk is associated with the availability and accessibility of a highly lethal means of killing ones self. At this point, the peer-reviewed literature appears to indicate that personal and household ownership of a firearm increases the

risk of both suicide and homicide (e.g., (Kellermann et al. 1993, Kleck and Hogan 1999). Risk is generally independent of the method used to store the firearm. In addition, the risk conferred by having a gun is independent of psychiatric status, and the present investigation finds no mental health differences between those who do and who do not have access to a firearm. Thus, our findings provide support for the idea that reducing access to firearms may be an effective way to decrease suicide (for review by experts from 15 countries, see Mann et al., 2005).

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Table 1. Mental health among those who have and do not have their own gun, General Social Survey, U.S., %

Question	Year	n	Has own gun			
			Yes		No	
			No	Yes	No	Yes
Have you ever felt you had a mental health problem?	1996	318	93.7	6.3	92.1	7.9
Have you ever felt you were going to have a nervous breakdown?	1996	402	82.0	18.0	74.8	25.3
...in the past month...underwent counseling for mental or emotional problems?	1991	197	97.0	3.0	89.0	11.0
	2004	316	92.8	7.2	94.9	5.1
During the past 4 weeks, have you had any of the following problems with your work or other daily activities as a result of any emotional problems (such as feeling depressed or anxious):						
Accomplished less than you would like?	2000	280	83.5	16.5	90.3	9.7
Didn't do work or other activities as carefully as usual?	2000	279	87.1	12.9	88.3	11.7
			Excellent	Poor	Excellent	Poor
Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good? (Excellent=0 days; Poor=10+ days)	2006	408	69.9	9.9	64.7	8.0
	2004	203	50.8	15.6	34.6	12.8
	2002	215	65.1	8.3	61.3	11.8
Serious psychological distress (K-6 score) (range=0-24; Excellent=0; Poor=13+)	1998	316	15.4	7.2	6.2	7.1
...how well the description applies to you... A person who feels sad and blue (Excellent=Not at all; Poor=A good, very good description)	2004	267	35.7	3.8	24.7	3.6
How much of the time during the past 4 weeks have you felt downhearted and blue? (Excellent=not at all; Poor=All, most, a good bit of the time)	2000	281	38.5	4.9	31.4	9.0
Depression (modified CES-D score) (range=0-49; Excellent=<5; Poor= 16+)	1996	344	30.9	22.0	29.1	25.1

Note. Data are weighted to account for the sampling design and nonresponse.

Table 2. Correlates of having own gun by mental health measures and demographic characteristics, GSS

		Has own gun	
		AOR ^a	CI ^b
Ever (vs. never) had a mental health problem (n=318)	1996	0.96	0.16, 5.90
Ever (vs. never) felt going to have a nervous breakdown (n=402)	1996	1.16	0.43, 3.12
Did (vs. did not) go to counseling for mental or emotional problems (n=197)	1991	0.69	0.02, 28.28
Did (vs. did not) go to counseling for mental or emotional problems (n=316)	2004	1.86	0.32, 10.63
During the past 4 weeks...as a result of any emotional problems...			
Accomplished (vs. did not accomplish) less than you would like (n=280)	2000	3.94	0.99, 15.66
Did not (vs. did) do work or other activities as carefully as usual (n=279)		2.67	0.66, 10.81
...how many days during the past 30 days was your mental health...not good?			
Excellent mental health (0 days vs. 1+days) (n=407)	2006	0.80	0.30, 2.13
Poor mental health (10+ days vs. <10 days) (n=407)		2.53	0.46, 13.99
Excellent mental health (0 days vs. 1+days) (n=203)	2004	1.55	0.78, 3.08
Poor mental health (10+ days vs. <10 days) (n=203)		1.21	0.12, 12.30
Excellent mental health (0 days vs. 1+days) (n=215)	2002	1.08	0.29, 4.13
Poor mental health (10+ days vs. <10 days) (n=215)		1.00	0.20, 4.98
Serious psychological distress (K-6 score)			
Low serious distress (score=0 vs. 1+) (n=315)	1998	5.61	1.02, 30.82
High serious distress (score=13+ vs. <13) (n=315)		0.53	0.07, 4.11
...a person who feels sad and blue			
Not a good description at all (n=267)	2004	1.92	0.64, 5.76
A very good or good description (n=267)		1.06	0.13, 8.47
...felt downhearted and blue during the past 4 weeks			
None (vs. all, most, a good bit, some, or a little bit) of the time (n=281)	2000	0.86	0.27, 2.71
All, most, a good bit (vs. some, a little bit, or none) of the time (n=281)		0.86	0.12, 5.95
Depression (Modified CES-D score)			
Not depressed (<5 vs. 5+) (n=343)	1996	0.97	0.41, 2.31
Depressed (16+ vs. <16) (n=343)		1.18	0.39, 3.56

^a Adjusted Odds Ratio

^b Bonferroni correction p<.005

Note. Each multivariate logistic regression included gender, ethnicity, nativity, age, level of education, and region of the U.S. Data are weighted to account for the sampling design and nonresponse.

Table 3. Mental health among those who have and do not have a gun in their home, General Social Survey, U.S., %

Question	Year	n	Household but no personal gun			
			Yes		No	
			No	Yes	No	Yes
Have you ever felt you had a mental health problem?	1996	494	92.1	7.9	92.3	7.7
Have you ever felt you were going to have a nervous breakdown?	1996	690	74.8	25.3	70.9	29.1
...in the past month...underwent counseling for mental or emotional problems?	1991	346	89.0	11.0	95.6	4.4
	2004	638	94.9	5.1	92.6	7.5
During the past 4 weeks, have you had any of the following problems with your work or other daily activities as a result of any emotional problems (such as feeling depressed or anxious)?						
Accomplished less than you would like?	2000	724	90.3	9.7	81.0	19.0
Didn't do work or other activities as carefully as usual?	2000	724	88.3	11.7	84.3	15.7
			Excellent	Poor	Excellent	Poor
Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good? (Excellent=0 days; Poor=10+ days)	2006	858	64.7	8.0	63.0	12.3
	2004	418	34.6	12.8	38.8	19.8
	2002	435	61.3	11.8	62.7	13.2
Serious psychological distress (K-6 score) (range=0-24; Excellent=0; Poor=13+)	1998	723	6.2	7.1	11.6	8.0
...how well the description applies to you...A person who feels sad and blue? (Excellent=Not at all; Poor=A good, very good description)	2004	530	24.7	3.6	31.3	5.7
...during the past 4 weeks...felt downhearted and blue? (Excellent=not at all; Poor=All, some, a good bit of the time)	2000	723	31.4	9.0	31.3	10.6
Depression (modified CES-D score) (range=0-49; Excellent=<5; Poor=16+)	1996	675	29.1	25.1	28.3	26.7

Note. Data are weighted to account for the sampling design and nonresponse.

Table 4. Correlates of household gun ownership by mental health and demographic variables, GSS

		Household but no personal gun	
		AOR ^a	CI ^b
Ever (vs. never) had a mental health problem (n=494)	1996	1.07	0.27, 4.30
Ever (vs. never) felt going to have a nervous breakdown (n=689)		0.69	0.36, 1.31
Did (vs. did not) go to counseling for mental or emotional problems (n=345)	1991	3.39	0.65, 17.59
Did (vs. did not) go to counseling for mental or emotional problems (n=638)	2004	0.64	0.16, 2.54
During the past 4 weeks...as a result of any emotional problems?			
Accomplished (vs. did not accomplish) less than you would like (n=721)	2000	0.31	0.10, 0.99*
Did not (vs. did) do work or other activities as carefully as usual (n=721)		0.67	0.23, 1.93
...how many days during the past 30 days was your mental health...not good?			
Excellent mental health (0 days vs. 1+days) (n=855)	2006	1.49	0.76, 2.94
Poor mental health (10+ days vs. less than 10 days) (n=855)		0.48	0.16, 1.46
Excellent mental health (0 days vs. 1+days) (n=418)	2004	0.92	0.32, 2.59
Poor mental health (10+ days vs. less than 10 days) (n=418)		0.64	0.13, 3.16
Excellent mental health (0 days vs. 1+days) (n=433)	2002	1.26	0.46, 3.47
Poor mental health (10+ days vs. less than 10 days) (n=433)		0.58	0.14, 2.45
Serious psychological distress (K-6 score)			
Low serious distress (score=0 vs. 1+) (n=715)	1998	0.48	0.13, 1.74
High serious distress (score=13+ vs. <13) (n=715)		1.49	0.37, 6.04
... a person who feels sad and blue			
Not a good description at all (n=529)	2004	0.73	0.29, 1.87
A very good/good description (n=529)		0.54	0.09, 3.22
...felt downhearted and blue during the past 4 weeks			
None (vs. all, most, a good bit, some, or a little bit) of the time (n=720)	2000	1.31	0.55, 3.12
All, most, a good bit (vs. some, a little bit, or none) of the time (n=720)		0.79	0.20, 3.03
Depression (Modified CES-D score)			
Not depressed (<5 vs. 5+) (n=672)	1996	1.01	0.50, 2.05
Depressed (16+ vs. <16) (n=672)		0.85	0.38, 1.69

^a Adjusted Odds Ratio

^b Bonferroni correction p<.005

Note. Each multivariate logistic regression included gender, ethnicity, nativity, age, level of education, and region of the U.S. Data are weighted to account for the sampling design and nonresponse.

End notes

- ¹ A study of Swiss soldiers concluded that mentally disturbed persons are disproportionately represented among those who own their own non-military gun (Killias and Haas, 2002).
- ² Although they have specific and different legal meanings, we use "own," "have," and "possess" interchangeably herein.
- ³ At 20 years of age, Swiss men serve a mandatory year of military service followed by a short period of duty in subsequent years. Each is issued and held accountable for a semi-automatic weapon and a sealed box of ammunition, which is inspected annually.
- ⁴ A Standardized Mortality Ratio is the ratio of deaths observed to those expected on the basis of the mortality rates of some reference population. In this case, the observed is the number of suicides among handgun purchasers, and the expected is the number of suicides among the general population. Values were adjusted for age and sex.

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