

## **Are “Goods for Guns” Good for the Community? An Update of a Community Gun Buyback Program**

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**Meetings Presented:**

This study was presented at the 6th annual meeting of the American Academy of Pediatrics Council on Injury, Violence, and Poison Prevention, October 22-25, 2016, in San Francisco, CA.

**Conflict of Interest:** There are no conflicts of interest for any of the authors except for Dr. Michael Hirsh who disclosed working for the Worcester Department of Public Health, City of Worcester on an ongoing basis receiving a small honorarium from the Worcester Institute for Senior Education regarding a lecture on gun buybacks.

## ABSTRACT

**Background:** Gun violence remains a leading cause of death in the United States. Community gun buyback programs provide an opportunity to dispose of extraneous firearms. The purpose of this study was to understand the demographics, motivation, child access to firearms and household mental illness of buyback participants in hopes of improving the program's effectiveness.

**Methods:** A 2015 Injury Free Coalition for Kids gun buyback program which collaborated with local police departments was studied. We administered a 23-item questionnaire survey to gun buyback participants assessing demographic characteristics, motivation for relinquishing firearms, child firearm accessibility, and mental illness/domestic violence history.

**Results:** A total of 186 individuals from Central/Western Massachusetts turned in 339 weapons. Participants received between \$25 and \$75 in gift cards dependent on what type of gun was turned in, with an average cost of \$41/gun. A total of 109 participants (59%) completed the survey. Respondents were mostly white (99%), male (90%) and first-time participants in the program (85.2%). Among survey respondents, 54% turned in firearms "for safety reasons". Respondents reported no longer needing/wanting their weapons (47%) and approximately one in eight participants were concerned the firearm(s) were accessible to children. Most respondents (87%) felt the program encouraged neighborhood awareness of firearm safety. Three out of every five participants reported that guns still remained in their homes, additionally; 21% where children could potentially access them and 14% with a history of mental illness/suicide/domestic violence in the home.

**Conclusions:** Gun buybacks can provide a low-cost means of removing unwanted firearms from the community. Most participants felt their homes were safer after turning in the firearm(s). In

homes still possessing guns, emphasis on secure gun storage should continue increasing the safety of children and families. The results of this survey also provided new insights into the association between mental illness/suicide and gun ownership.

**Level of Evidence:** Level III, Prognostic and Epidemiological

**Key Words:** Fire-arm safety, injury prevention

## **BACKGROUND**

Firearm injuries are a leading cause of death in the United States (1). In 2013, more than 84,000 shootings occurred in the United States resulting in over 32,000 deaths. (2). Based on the findings from several studies, between 20% to 40% of American homes with children have at least one gun (3-7), of which 5-8% have guns stored loaded and unlocked (8, 9) Injuries to children from guns can be divided into two categories: intentional (homicide/suicide) and unintentional. Access to a gun greatly increases the likelihood that an intentional gun related injury toward one's self or others will be lethal. In addition, suicide attempts with a gun have a 90% fatality rate (10). Both intentional and unintentional injuries can be prevented by limiting access to, and safe storage of, firearms (11). Previous research has shown that suicide and homicide rates are correlated with household firearm ownership (12-14)

Gun Buyback programs have existed for over 30 years with varying methods and degrees of success (15-19). The Worcester Goods for Guns Buyback (G4G) program began in 2002 with goals to remove unwanted or improperly stored firearms from homes, educate the community about firearm-related injuries, and to promote safe gun ownership practices. Previous studies have shown that gun buyback programs can promote firearm injury prevention and community education about the safe storage of firearms (17, 19).

Since 2009, the G4G program performed face-to-face interviews with program participants to better understand their home environment, firearm safety experience, and weapon storage. In 2015, we carried out an anonymous survey that was designed to gather more detailed insight into participant's perspective of the program and provide additional areas of improvement to prevent

childhood firearm related injuries. The primary aim of this study was to understand the demographics and motivation of gun buyback participants who relinquish their firearms. Secondary aims were to identify firearm accessibility to children and household mental illness of buyback participants in hopes of improving the program's effectiveness.

## **METHODS**

### *Preparation*

Simultaneous gun buyback events were held on December 12, 2015 at 13 different police department locations throughout Central and Western Massachusetts. Organization and publicity of the event was held in a similar manner to that of our previous study(17). Guns were turned in with a "no questions asked" policy. The firearms were disarmed by local police officers and stored in a secured evidence room to be disposed of properly. Gift certificates from local supermarkets were provided as an incentive to individuals for each gun turned in. The amount of the gift certificate varied based on the type of gun: \$25 for a rifle, \$50 for a pistol or revolver, and \$75 for an automatic/semi-automatic long or handgun. In addition, BB guns or replica guns were also collected for \$25.

### *Surveys*

Participants completed a 23-question survey that was offered either electronically or in a paper format. This self-administered questionnaire survey was based on previous gun buyback surveys (17, 19). Questions were asked about the participant's demographic profile, motivation for relinquishing a firearm, experience with firearms remaining in the home, attitudes toward the storage of guns, and presence of children in the home. In addition, several mental health and

domestic violence questions were asked (see Appendix, Supplemental Digital Content 1, <http://links.lww.com/TA/A952>). There was no identifying information collected on the survey that could link the firearm back to the individual. The Institutional Review Board at the UMMS approved this study.

### *Data Analysis*

Data were collected and managed using Research Electronic Data Capture (REDCap) hosted at University of Massachusetts Medical School. REDCap is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. (20). Descriptive statistical analyses were performed using *Stata Statistical Software: Release 13* (College Station, TX: StataCorp LP).

## **RESULTS**

### *Survey Participation*

During the December 2015 Gun Buyback, 186 individuals from Central/Western Massachusetts turned in weapons at one of 13 area locations. A total of 339 weapons were collected, with the program paying an average of \$41/gun. Of the 186 participants turning in weapons, 109 participants (58.6%) completed the self-administered survey. A total of 340 firearms were relinquished: 116 Long Guns, 122 Revolvers, 51 Semi-Automatic and 51 Replica Guns.

### *Demographics/Safety Training*

Most respondents were Caucasian males (99%) over the age of 55 years (90%) and were first-time participants in the program (85%). Firearms turned in were mostly inherited (48%) or purchased (30%), with the remainder being received as gifts, turned in for another person, or found. More than three-quarters of respondents had received formal firearm training or read safety information related to firearms (Table 1).

### *Gun Buyback Participation and Influence on the Community*

More than one half (54%) of survey respondents turned in their firearms for safety reasons. The most common reasons cited for turning in a firearm were that it was no longer needed, a family member asked for it to be turned in, or concern that a child would gain access to it (Table 2). Almost all respondents (87%) felt the G4G program encouraged neighborhood awareness about firearm safety and felt their home was now safer (43%).

### *Firearm Violence, Accessibility to Children and Mental Illness*

Almost one in four respondents (22%) knew of someone who was a victim of firearm violence and the majority (83%) knew someone who possessed a gun in their home or vehicle. Nearly all respondents (95%) answered the mental health, suicide or domestic violence questions. Of these, 12 (12%) responded to having a history of mental illness, suicide, or domestic violence in their families. Over half of respondents (61%), stated that guns still remained in their homes after the buyback program. Of the respondents with remaining firearms, 21% stated that children could potentially access them, and 14% stated a household member had a history of mental illness, suicide, or domestic violence in the home (Table 3). Of participants that answered positively to



questions of history of mental illness, suicide, or domestic violence, only one had a firearm remaining in their home that children could potentially access.

## **DISCUSSION**

The results of this survey of more than 100 adults from Central/Western Massachusetts that participated in the Goods for Guns Buyback provides a low-cost means to remove unwanted firearms, leaving around 40% of participants' homes firearm free. Although almost three-quarters of respondents have formal firearm training, they share similar concerns about the dangers of firearms. Over half of the respondents surrendered their firearms for safety reasons: 43% feeling their home was now safer and almost all felt the G4G program encouraged neighborhood awareness. Over 300 firearms were collected resulting in costs of approximately \$14,000 dollars.

### *Mental Illness, Domestic Violence, and Firearms*

In the past, face-to-face interviews were conducted during G4G buybacks and participants did not answer questions about mental health or domestic violence (21). The anonymous format of our survey, as well as offering it online, gave valuable insights to the mental health profile of survey respondents' households. Among our respondents, 12% had a history of mental illness, suicide or domestic violence in their homes. In the homes that retained firearms even after the gun buyback, 14% had a history of mental illness, suicide or domestic violence. This could be an underestimate given undiagnosed mental illness and potential underreporting. Even so, this is crucial information, because firearm suicide is the third leading cause of injury death among persons 35 years and older (2) and almost two-thirds of firearm-related deaths in the United

States are due to suicide (22). With a better understanding of the role that mental health plays in our respondents' households, we can direct future injury prevention efforts to provide avenues to safely remove or properly store firearms, preventing harm to themselves or others and ultimately keeping communities safe.

### *Children and Firearm Safety*

In our study, almost two-thirds of respondents had firearms remaining in their homes even after the gun buyback program, 21% of which children could potentially access. In households with children and firearms, studies have shown that up to 43% have at least one gun that is unlocked (5) and more than 10% store at least one firearm unlocked with ammunition (5, 23). Fatal childhood gun-related injuries are more likely to occur at home (24). The gun owner is most often a relative and the shooter a family member (25, 26). When young children shoot children, it is also more likely that the gun was left unlocked and not secured in the home (27).

A White Paper from the American Academy of Pediatrics emphasized that the best way to prevent any type of firearm injury is for children to live and play where there are no guns (28). This recommendation is based on research showing that the risk of a firearm related injury increases with greater proximity and access to firearms (29-33) and that fewer firearm injuries result when access is limited (27, 34). The G4G buyback removes unwanted or unused guns from households where children have the potential to access these firearms. Unfortunately, almost a quarter of respondents stated that children might still have access to remaining guns in their homes. This information is important to provide ways to safely secure and store these weapons away from children, ultimately preventing unintentional firearm injury.

### *Implications and Further Benefits*

While, Massachusetts ranks 48<sup>th</sup> nationally in gun ownership, 12.6% of the population still owns a firearm as of 2015 (35). Of note, Massachusetts has seen a decrease in the age-adjusted incidence proportion of firearm-related mortality by 0.4 deaths per 100,000 persons from 2005-2015 (36). This is a stark comparison to the trends seen in Wyoming (the state with the highest gun ownership, 60%) and nationally, which both had an increase incidence proportion of firearm deaths by 6.2 and 1.6 per 100,000 persons respectively, during the same time period (35, 36). Although this trend does not necessarily implicate a causal relationship between our gun buyback and the decrease in firearm-related mortality in Massachusetts, it may be a significant contributing factor.

Our gun buyback program provides a crucial point of contact with community members, many of which have at risk households with unlocked guns, potential access to children, and mental illness. Our data indicates that this is a critical opportunity to engage the community and provide additional safety training. In addition, it provides free gunlocks to help address the problem of homes with unsecured firearms, with or without relinquishing a firearm. Lastly, with firearm related injuries as one of the leading causes of death in Americans <65-year-old (37), medical organizations such as the American Academy of Pediatrics and American Medical Association have been encouraging physicians to ask patients about gun ownership (38, 39). Gun buybacks provide an answer to questions raised about how to dispose of unwanted weapons.

### *Study Strengths and Limitations*

Several strengths were present in this study. The study offered insights into the demographic characteristics, motivations to relinquish firearms, secure firearm storage and potential firearm access to children in homes of participants in a gun buyback. We gained insight into the prevalence of mental illness and domestic violence that is present in the homes of gun buyback participants.

Limitations of our study also need to be kept in mind in the interpretation of the study results. The questionnaire survey was not validated, our survey response rate was less than 60%, and only 109 adults responded to our survey. In addition, most respondents were middle-aged Caucasian males. This population is quite different compared with the population most at risk of firearm-related injury and death. Based on the published literature, young adults between the ages of 25 and 34 years and Non-Hispanic Blacks have the highest rate of fatal firearm injury (40). According to Massachusetts State Police Superintendent Col. Mckeon, approximately one third of firearm-related crimes committed in Massachusetts are performed using stolen weapons (41). Therefore, removing weapons from homes might limit the chance of them being used in crimes.

### *Conclusions*

The Worcester G4G Buyback provides a low-cost means of removing unused and unneeded weapons from our community. The participant survey's anonymity and the electronic format option provided helpful insights into the magnitude of mental illness, suicide, and domestic violence present in the homes of persons who own guns. Safe weapon storage should be emphasized for homes that still possess firearms, in order to increase the safety of children and families.

## **AUTHOR CONTRIBUTION**

Jonathan Green: Dr. Green conceptualized the study, drafted the initial manuscript, reviewed and revised the manuscript, and approved the final manuscript as submitted.

Rachelle N. Damle: Dr. Damle performed statistical analysis, contributed to the initial draft, reviewed and revised the manuscript, and approved the final manuscript as submitted.

Rebecca E. Kasper: Mrs. Kasper reviewed and revised the manuscript and approved the final manuscript as submitted.

Pina Violano: Dr. Violano reviewed and revised the manuscript and approved the final manuscript as submitted.

Mariann Manno, Dr. Manno reviewed and revised the manuscript and approved the final manuscript as submitted.

Pradeep Nazarey: Dr. Nazarey reviewed and revised the manuscript and approved the final manuscript as submitted.

Jeremy Aidlen: Dr. Aidlen contributed to the initial draft reviewed and revised the manuscript and approved the final manuscript as submitted.

Michael P. Hirsh: Dr. Hirsh conceptualized the study, contributed to the initial draft, reviewed and revised the manuscript, and approved the final manuscript as submitted.

## **ACKNOWLEDGEMENTS**

We would like to acknowledge the program support and collaboration of the Worcester Division of Public Health, Worcester Police Department, Office of City Manager Ed Augustus, Office of Mayor Joseph Petty, City of Worcester, and the Office of Worcester County District Attorney Joseph Early. We would like to acknowledge Esther Borer in the Department of Injury Prevention at University of Massachusetts Memorial Medical Center. Lastly we thank the Injury Free Coalition for Kids for its support throughout the years of the gun buybacks.

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**TABLES:**

**TABLE 1.** Firearm Training among Survey Respondents: Worcester Gun Buyback Program

	N	%
<b>Previously received formal training*(n=107)</b>	<b>93</b>	<b>87%</b>
Military	34	37%
Police/law enforcement	16	17%
Private Pistol Permit	46	50%
Other	11	12%
<b>Previously read safety information*(n=109)</b>	<b>93</b>	<b>85%</b>
Newspaper/Radio/TV	28	30%
Sportsman/Club Sponsored Program	54	58%
School	10	11%
Physician's office	4	4.3%
Emergency Room	3	3.2%
Online	21	23%
Other	14	15%

\*participants were able to choose more than one answer, % adds up to more than 100%

<b>TABLE 2. Reasons cited for turning in firearm: Worcester Gun Buyback Program</b>		
	<b>N</b>	<b>%*</b>
<b>Reason*</b>		
Didn't need the firearm	51	47%
Miscellaneous Reason**	17	16%
A family member asked you to	15	14%
Concerned that children had access	14	13%
Wanted gift certificates	10	9.2%
Cannot store it properly	7	6.4%
Afraid of the firearm	7	6.4%
Did not answer	7	6.4%
Concerned might be used against you	4	3.7%
No longer being used	3	2.8%
Old gun	2	1.8%
<p>*participants were able to choose more than one answer, % adds up to more than 100%</p> <p>**Miscellaneous reasons cited for turning in gun: didn't want it, turning in for a friend, too many guns, it would be stolen, gun not accurate, inherited, owner passed</p>		

<b>TABLE 3. Prevalence of Mental Health and Domestic Violence Conditions: Worcester Goods for Guns Buyback</b>		
	<b>N</b>	<b>%</b>
<b>Conditions*</b>	<b>104</b>	
Mental illness in home	8	7.7%
Suicidal ideation/suicide attempt in home	3	2.9%
Suicide by family member	5	4.8%
History of domestic violence in home	2	1.9%
<b>Guns remaining in home with:</b>		
Mental illness	4	6.1%
SI/suicide attempt	2	3.0 %
Suicide by family member	4	6.1%
Domestic violence in home	2	3.0%
* These questions were not mutually exclusive. Participants could have answered yes to multiple questions		

# Worcester Goods for Guns Gun Buyback Survey

**This survey is completely anonymous. Please answer questions honestly.  
Thank you for your participation.**

**1. Have you every turned in a firearm(s) before? (select one)**

☐Yes ☐No ☐Don't Know

**2. Is/are there any firearm(s) left at your home? (select one)**

☐Yes ☐No ☐Maybe

**IF YES are they locked? (select one)**

☐Yes ☐No ☐Maybe

**3. Did you turn in the firearm(s) for safety reasons? (select one)**

☐Yes ☐No ☐Don't Know

**4. Why did you turn in your firearm(s) today? (select all that apply)**

- ☐You were afraid of the firearm(s)
- ☐You, or someone you know personally had a bad experience with a firearm(s)
- ☐You were concerned that children would get and use the firearm(s)
- ☐You believed there would be a shooting in your home
- ☐You were concerned that firearm(s) might be used against you
- ☐A family member asked you to turn it in
- ☐You cannot store it properly
- ☐You didn't need the firearm(s)
- ☐You didn't know how to use the firearm(s)
- ☐You wanted or needed the gift certificates
- ☐Other \_\_\_\_\_ (please describe)

**5. Have you ever had any formal training on how to use a firearm(s)?  
(select one)**

☐ Yes ☐ No ☐ Don't Know

**If you selected YES: (select all that apply)**

- ☐ Military  
☐ Police/Law Enforcement Firearms Training  
☐ Private Pistol Permit (NRA-Handgun Safety Course)  
☐ Other \_\_\_\_\_ (please describe)

**6. Do you personally know anyone who has been injured by a firearm(s)?  
(select one)**

☐ Yes ☐ No ☐ Don't Know

**7. Have you ever read any firearm safety information? (select one)**

☐ Yes ☐ No ☐ Don't Know

**If YES check all that apply:**

- ☐ Newspaper/Radio/TV  
☐ Sportsman/ Club Sponsor Program  
☐ In School  
☐ Physician's Office  
☐ Emergency Room  
☐ Online  
☐ Other \_\_\_\_\_ (please describe)



**8. We would like to learn a little more about the firearm(s) you turned in today. Did you buy the firearm(s)? (select one)**

☐ Yes ☐ No

**If YES, did you buy it at a:**

- ☐ Pawnshop
- ☐ Mail Order
- ☐ Private Sale
- ☐ Gun Store
- ☐ Gun Show
- ☐ Classified Ad
- ☐ Sporting section of a department store ( i.e. Walmart, Dick's, Sports Authority)
- ☐ Other \_\_\_\_\_ (please describe)

**If NO how did you obtain the firearm(s)?**

- ☐ Inherited it
- ☐ As a gift
- ☐ Found it
- ☐ Other \_\_\_\_\_ (please describe)

**9. Do you feel that your home is safer since you turned in your weapon(s)? (select one)**

☐ Yes ☐ No ☐ Don't Know

**10. Do you feel that this gun buyback program makes your community/neighborhood more aware of the risks of firearms? (select one)**

☐ Yes ☐ No ☐ Don't Know

**11. How many people do you know who have a firearm on their property including home and or vehicle? (select one)**

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 or more

**12. Would any of them consider bringing in the firearms into a future gun buyback? (select one)**

☐ Yes ☐ No ☐ Don't Know

**13. What do you think would motivate them to turn them in?**

\_\_\_\_\_ (please describe)

**14. What is your age? (select one)**

☐ 15-24 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55 or older

**15. What is your gender? (select one)**

☐ Male ☐ Female

**16. What is your race? (select one)**

☐ White/Caucasian

☐ Black/African American

☐ Asian/Pacific Islander

☐ American Indian/Native American

☐ Hispanic

☐ Other \_\_\_\_\_ (Please describe)

**17. Do you have any children living with you or that visit your home that can potentially have access to your firearms? (select one)**

☐ Yes ☐ No ☐ Don't Know

**18. Has there been a history of mental illness of anyone living in your home? (select one)**

☐ Yes ☐ No ☐ Don't Know

**19. Have you or anyone in your household ever thought about or attempted suicide? (select one)**

☐ Yes ☐ No ☐ Don't Know

**20. Have any of your family members committed suicide? (select one)**

☐ Yes ☐ No ☐ Don't Know

**21. Is there a history of domestic violence in your home? (select one)**

☐ Yes ☐ No ☐ Don't Know

**22. Are you interested in receiving gun locks to properly store any other firearms? (select one)**

☐ Yes ☐ No ☐ Don't Know

**23. What is your Zip Code?**

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