Report and Recommendations on Firearm Safety in Oregon

Results of Multiple Methods of Literature Review, Analysis of Existing Data, and Original Data from Oregon Healthcare Provider Qualitative and Quantitative Projects

A project funded, in part, by the State of Oregon and the Oregon Health & Science University Office of the Provost

Oregon State Legislature,

Thank you for the opportunity to present our collective recommendations on firearm safety in Oregon in the following report, made possible through funding from the State of Oregon and OHSU Office of the Provost. The work summarized in this report was done through an interprofessional team collaborating across three of Oregon's leading academic institutions: Oregon State University, Portland State University, and Oregon Health & Science University.

Firearm-related injuries and mortality have reached new and alarming frequency since the COVID-19 pandemic, providing additional urgency to address the clear public health challenges in Oregon from firearms.

Foundational to this report are data described in the OHSU project report, *Gun Violence as a Public Health Issue* (2018). These data highlight that even before extraordinary social and economic stress caused by the COVID-19 pandemic, Oregon experienced an average of 456 deaths each year due to firearm-related injuries. This report furthermore includes an extensive review of published literature and original data collection, including a survey of Oregon health care providers and provider focus groups.

Key to these recommendations, and particularly impactful to public health, is what OHSU discovered when it surveyed health care providers: more support, education, and firearm safety counseling resources for health care providers and their patients is needed to address firearm safety in Oregon. As Oregon's academic health center, this recommendation rings exceptionally true for OHSU.

This summer, I professionally retired from academic work and my role as OHSU Provost. Looking back on my 10 years at OHSU, I am exceptionally proud to have contributed to the *Gun Violence as a Public Health Issue* program and collaborative efforts to chart a path for public health work on gun safety in Oregon. It is a highlight of my career.

OHSU recognizes that the work continues on this vital public health issue in Oregon and looks forward to continuing to partner with the state on solutions that support the health and wellbeing of Oregonians. For any additional questions on the content of this report, please contact Julie Hanna at hannaju@ohsu.edu.

Sincerely,

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Professor Emeritus, OHSU-PSU School of Public Health
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Executive Summary

Gun Violence as a Public Health Issue (GVPHI) is a program sponsored by the Center for Diversity and Inclusion (CDI) at Oregon Health & Science University (OHSU) and overseen by the Office of the Provost (See Appendix V). Foundational to this public health work are data described in the OHSU project report, *Gun Violence as a Public Health Issue* (2018), that Oregon experiences an average of 456 deaths each year due to firearm-related injuries. The majority of these deaths are due to suicide. Our multi-method investigation involved secondary data analysis of public domain surveys (Appendices I & II); an original data collection including a survey of Oregon healthcare providers (Appendix III), and provider focus groups (Appendix IV).

There was sparse research to guide our understanding of paths to improving Oregon firearm safety. This is in part due to the 1996 restriction of funding for firearm research at the *Centers for Disease Control and Prevention*, the CDC (The "Dickey Amendment") and the extension of this ban to the *National Institutes of Health* in 2012. While the resulting picture is that healthcare providers often think they could or should counsel patients on firearm safety as they do with other preventive topics (like seatbelt use and behavioral factors like smoking and diet), they have little preparation to do so. Having resources, such as safety equipment available at no or low-cost (e.g., firearm locks, firearm safes) appears to increase provider-patient conversations. In addition, provider engagement on firearm safety in the context of child safety is more common than other patient groups. In part, this may be because of the early explicit guidance of the *American Academy of Pediatrics*. Appendix II includes a more detailed summary of the published literature that formed the background for the projects we designed to understand the current circumstances in Oregon, and potential for Oregon healthcare providers to engage with their patients on firearm safety.

We first examined existing public data that were part of two ongoing anonymous surveys to understand the health and health behaviors of Oregon youth and adults. The CDC funds both surveys, in part. The *Youth Risk Behavior Survey* (YRBS) has been part of national monitoring among youth administered biannually to high school students in 9th and 12th grade. In Oregon, this takes the form of our own state version, the *Oregon Healthy Teens Survey* (OHT), which surveys 8th and 11th grade youth. Periodically, the survey includes five questions on weapons and safety, and we analyzed data from the surveys conducted in 2013 in Oregon and the U.S., and in the U.S. from surveys in 2015 and 2017. The adult survey data derive from the CDC's *Behavioral Risk Factor Surveillance System* (BRFSS). States administer the BRFSS each year, and periodically the survey includes up to five measures on firearm ownership and safety: we analyzed Oregon data from 2001, 2002, and 2004, and also from national data among states that used a longer set of questions about firearms and firearm safety. Periodic updated data, including more detailed questions, would be useful in monitoring firearm injury risk.

State data from the OHT Survey from 2015 included two questions about feeling safe at school. These were compared with national data. Six percent of students in Oregon reported missing class because feeling unsafe in school grounds which was similar to the U.S. data (5.6%). About 6% of high school students in the U.S. and Oregon reported they had been

threatened/injured with a weapon in school during the prior year. The more detailed report suggests that as high as 5.5% of U.S. students have carried a gun, and about a similar percent said they carried a weapon of some sort (gun, knife, club) on school property in the last 30 days. It would be useful to have similar data for Oregon students. Please see Appendix I for a full report of Oregon OHT data.

The Oregon BRFSS included three questions during 2001, 2002, 2004, and 2017 that asked about firearms in homes. The CDC further defined firearm safety based on combining information from these core questions. We compared Oregon data to the national BRFSS data. In 2001, the prevalence of household firearm ownership was statistically significantly higher in (Oregon 39.8%) compared to the national average (31.7%). White Oregonian respondents reported more household gun ownership than other racial and ethnic groups (42.9% compared to 23.8%), which also was the case for subsequent survey years. The level of gun ownership were also higher for Oregon than the nation in 2002, and Oregon households were also more likely to report that these firearms were loaded (25.9% vs. 22.7%) and not locked (68.8% vs. 60.3%). Combining firearm safety questions, Oregon households with firearms were considered "at risk" in homes with loaded and unlocked firearms at a higher level (7.1%) compared to the national level (4.5%). The 2004 data continued to show higher prevalence of households with firearms in Oregon than the nation, and loaded and unlocked firearms. Recent data from 2017 show that Oregon household firearm ownership is similar to the national levels, and people are less likely to live in a household with a loaded firearm (12.2% vs. 18.1%). Updated data collected on a periodic basis, would be useful to understand ongoing patterns or firearm risks in Oregon households. This is especially true given the pandemic and national bias and violence events leading to social reckoning. Appendix II provides more in-depth information about the CDC surveys and Oregon and national BRFSS data. That report also includes a CDC-generated module of more detailed firearm questions that might be useful in assessing household risks.

Existing information on aspects of firearm safety and healthcare providers informed our web-based survey on firearm safety. A total of 589 Oregon physicians (n=441), nurse practitioners (n=121), and physician assistants (n=27) completed online surveys. These healthcare providers estimated that between 44% and 49% of their patient households have firearms. The survey's findings revealed a lack of awareness among healthcare providers of existing programs to prevent firearm injuries, including emergency gun storage, free gunlocks, and cables.

A majority (83%) of respondents reported that they did not assess every adolescent or adult patient they see about firearm injury prevention. On average, respondents reported that about 27% of their patients would benefit from firearm injury prevention, though only about 20% actually reported counseling these patients. Importantly, 48% of providers reported that counseling is very important or extremely important. They also reported a number of issues that prevent healthcare providers from counseling patients about firearm injuries, including lack of time (26%), patients not being open to counseling (18%), and forgetting to do it (21%). Nearly half of respondents (47%) thought that developing a practice-based protocol to address firearm injury prevention with patients would be helpful to them.

We also collected original qualitative data from Oregon healthcare providers to better understand the Oregon context for firearm safety. This work was informed by literature on firearm safety and healthcare provider experience in discussing, or interest in discussing, this topic with their patients. We recruited Physicians, Nurse Practitioners (NPs), and Physician Assistants (PA) with the help of our community partners, including the OHSU Campus for Rural Health sites, and the Oregon Medical Association (OMA members are both PAs and physicians). We held four focus groups between July 2019 and December 2019. Two groups were held in urban/suburban Portland, and two were in rural towns. Groups met for about an hour (up to 70 minutes) and the conversations were recorded and transcribed. We used a structured focus group question guide for each meeting. A total of 22 providers engaged in these in-person sessions. Two experienced qualitative analysts iteratively coded transcripts that revealed a set of 11 primary codes.

Results showed that healthcare providers interact with patients for whom both the potential and actual effects of firearm violence are real. All focus group participants had experience with some type of actual or potential firearm violence, and in some cases, they expressed fear that a patient would use a firearm and die by suicide. Most providers did not have training for how to engage with patients about firearm safety and the potential for harm. Most providers were not aware of empirical data that demonstrated best practices. Most rural providers assumed that the majority of their patient population had firearms and many believed that a significant percentage of those firearm owners did not have a firearm lock or keep the firearm in a safe, with the ammunition in a different location. Most providers had discussed the risks of firearms with some patients, but were doing so on an ad hoc basis, according to their own instinct and experience, and were not using evidence-based protocols. Our findings suggest that:

1) Providers believe firearm ownership is prevalent among their patient populations;
2) Violence by firearms is something that they see, treat, and are concerned with;
3) There are few data reports to understand their role or impact they might have if they intervene;
4) Conversations around firearm ownership as a public safety issue are challenging, and can create distrust between providers and patients; and
5) There is no standard protocol for intervention, so healthcare providers are "making it up as they go along."

Other findings include problems with a culture gap on firearms between providers and their patients; inadequate time in clinical settings to have injury prevention conversations; and not knowing how to refer patients to resources for firearm safety. The results suggest providers are willing to work with patients' on firearm safety, but they need training and tangible resources. Appendix IV includes the full report of the focus group phase, methods, and results.

Based on the background literature and the key findings from all of these sources, we make the following recommendations.

1) Identify and engage a public health (Oregon Health Authority [OHA]) practice "champion" for firearm safety to implement population surveillance, comprehensive programing for firearm safety storage and equipment, and best practice educational and counseling strategies in healthcare settings.
2) Develop and disseminate free Oregon-centric firearm safety counseling training programs for healthcare providers.
3) Develop and disseminate tailored local media campaigns with community partners to address knowledge gaps and create communities informed about and committed to firearm safety.
4) Develop and disseminate a toolbox of practice-based protocols and other healthcare setting specific tools that will help to overcome logistical barriers to firearm counseling and provide access to low-cost firearm safety training and firearm security equipment.
5) Monitor program outcomes and healthcare provider knowledge and emerging education needs in Oregon with combined surveys and qualitative methodologies.
6) Initiate biannual survey modules, including all questions developed and validated by the CDC, that monitor firearm safety based on the existing Centers for Disease Control and Prevention (CDC) Oregon Healthy Teens (OHT), and Behavioral Risk Factor Surveillance System (BRFSS) Surveys.

Acronyms

AAP. American Academy of Pediatrics

APSA. American Pediatric Surgical Association

BRFSS. Behavioral Risk Factor Surveillance System (adult state-based population survey)

CDC. Centers for Disease Control and Prevention

CDI. Center for Diversity and Inclusion at OHSU

CI: Confidence Interval (for % estimate)

CME. Continuing Medical Education

DO. Doctor of Osteopathic Medicine

DP. Nurse Practitioner with Dispensing Privileges

ED. Emergency Department

GVPHI. Gun Violence as a Public Health Issue (Public Health Initiative at OHSU and PSU)

MD. Doctor of Medicine

NIMH. National Institute of Mental Health

NP. Nurse Practitioner

OHSU. Oregon Health & Science University

OHA. Oregon Health Authority

OHT. Oregon Healthy Teens Survey (Oregon-specific adaptation of the Youth Risk Behavior System survey of the CDC)

OMA. Oregon Medical Association

OSBN. Oregon State Board of Nursing

PA. Physician Assistant

PSU. Portland State University

SD. Standard Deviation (of a mean statistic)

YRBS. Youth Risk Behavior System survey

Introduction and Background

Gun Violence as a Public Health Issue (GVPHI) is an ongoing program sponsored by the Center for Diversity and Inclusion (CDI) at Oregon Health & Science University (OHSU) and overseen by the Office of the Provost (See Appendix V for contributors and funding). This report includes an analysis and synthesis from a multi-method investigation involved secondary data analysis of public domain surveys (Appendices I & II); and original data collection including a survey of Oregon healthcare providers (Appendix III), and provider focus groups (Appendix IV).

This work was funded jointly by the State of Oregon and OHSU's Office of the Provost. As a starting point to inform the development of the survey, we conducted an extensive review of published literature on health provider surveys related to firearm safety, interventions studied, and models for provider education that would inform work in Oregon State, including specific recommendations. Importantly, federal agencies were restricted from funding research on firearms starting in 1996 (The "Dickey Amendment," specifically enacted for the *Centers for Disease Control and Prevention*; the CDC) and extended to the *National Institutes of Health* in 2012. Thus, peer-reviewed literature on firearm injury prevention was limited for the present report. Recent policy changes are likely to increase future research information due to new funding on violence and injury prevention at the CDC.

Published Literature

Literature on Firearm Injuries and Epidemiology. Firearm violence is responsible for more than 67,000 injuries and 32,000 deaths each year (Fowler et al., 2015). A report from the CDC reported 39,773 firearm-related deaths in 2017 (Kochanek et al., 2019) among which suicide was the most common. Suicide risk, including by firearms, is most common among older white men. In 2017, the CDC reported 17,240 deaths by suicide for Non-Hispanic white men aged 45 and over (Curtin & Hedegaard, 2019). Less clear is how increased the risk is when firearms are readily available, although theoretically gun restrictions can be linked to suicide prevention (Yip, Caine, Yousuf, et al., 2012). Assuming increased risk exists, there is evidence that provider behaviors are currently not optimal for the provision of suicide prevention counseling and services. Data from the 2015 web-based *National Firearms Survey* suggested that a minority of adults knew that suicide was a more common cause of violent death than homicide, and that this was the case for firearm deaths (Morgan, Rowhani-Rahbar, Azrael, & Miller, 2018).

A study of U.S. Veterans revealed that medical records were unlikely to record that patients were screened for firearm access and impulsivity (unnecessarily risky behavior); and older patients were less likely to have received referrals or services, including mental health (Simons, Van Orden, Conner, & Bagge, 2019). However, mental health providers were more likely to document and refer patients for services in this study. Emergency Department nursing leaders (n=190) completed a telephone survey regarding their views on suicide prevention and lethal-means counseling (Betz, Brooks-Russel, Brandspigel, Novins, Tung, & Runyan, 2018). Though the level of support for counseling suicidal patients was high, the majority of respondents reported skepticism about successfully preventing suicide.

Literature on Healthcare Provider Research and Surveys. We found relatively few research publications about healthcare provider beliefs and practices related to firearm safety. In addition, original surveys were unavailable for many articles reporting survey findings. From available surveys, we compiled an "item bank" to inform the development of our Oregon healthcare provider survey (Appendix III).

Two older studies published in the late 1990s found that a high percentage of physicians believed they should provide counseling, though a small percent actually did this (Everett et al, 1997; Barkin et al, 1998). A national survey of 271 family physicians (Everett et al, 1997) reported that 78% did not have formal training on counseling patients, and 84% never or rarely counseled patients. Half of the respondents believed firearm safety was a low priority for them. In a survey conducted by Barkin and colleagues (1998) of 325 Los Angeles pediatric nurse practitioners and family physicians conducted during the same time, the findings were that 80% said they should counsel, but only 38% did this.

A survey of internal medicine physicians (Butkus & Weissman, 2014) found that a majority expressed concerns about firearms and favored stricter gun control legislation, and 66% believed physicians should counsel patients. However, 58% reported they never ask patients about guns in their homes. Another more recent study, that involved primary care physicians rating vignettes about highly politicized issues (including firearms) (Hersh & Goldenberg, 2016), compared their responses according to political party. In general, Democrats rated firearm issues as more serious than Republicans, and they urged patients not to store firearms at home. However, Republican physicians were significantly more likely to ask about safe firearm storage. Finally, while Damari and colleagues found that 65% of physicians reported they knew how to counsel patients, only 25% did (Damari, Ahluwalia, Viera, & Goldstein, 2018). Interestingly, the percentage was higher among respondents who had received Continuing Medical Education (CME) on the topic, suggesting an incentive path for provider education in Oregon.

Ketterer and colleagues surveyed emergency department (ED) physicians about their knowledge of firearms, including patients carrying firearms in the ED. Despite the finding that up to 25% of trauma patients carry weapons, the majority of physicians had no experience handling a firearm. Interestingly, a study that focused on patients' perceptions of ED physicians found that the majority (90%) did not think doctors were discriminating against them when they counseled about firearms. In addition, the majority of patients thought doctors *should* counsel on firearm safety (76%), and believed this would improve firearm storage (71%) (Boge et al., 2019).

The *American Academy of Pediatrics* (AAP) has included questions about firearms in its Periodic Survey since 1994 (See Olson et al, 1997; 2007; 2020). The surveys asked about pediatricians' experiences treating gun injuries, counseling practices, and views on gun injury prevention. The AAP fielded questions during 2019 (Olson et al., 2020), and found that "high portions of pediatricians, 90% or more, reported that violence prevention should be a pediatric priority." (Olson et al, 1997; 2007; 2020). Our OHSU colleague, Dr. Ben Hoffman, introduced us to the AAP research group, who granted approval for use of any of their questions (with appropriate attribution). Overall, response to the AAP survey has decreased over time. Some measures of firearm safety have fallen somewhat (e.g., fewer providers asking about firearms in

the home) and some have fallen dramatically for pediatricians reporting that they should ask parents to remove handguns from the home (65% yes to 40% yes). However, pediatricians have been consistent about asking parents to unload and lock their firearms (95% to 96% across all four surveys).

The *National Institute of Mental Health* (NIMH) consortium directed at implementation of firearm safety in pediatric settings interviewed 82 primary care practices in two healthcare systems to better understand the *Safety Check* protocol (Wolk et al., 2017: Screening, brief counseling, provision of firearm locks). Shari Jager-Hyman and colleagues (2019) conducted a qualitative study on the perspectives of firearm stakeholders concerning the *Safety Check*, which revealed that while most stakeholders interviewed agreed about the acceptability of counseling and provision of firearm locks, they did not feel the same way about screening for firearm ownership as an acceptable intervention approach. Additional results are forthcoming, and the survey data (mixed methods) are not yet available. Rinad, Beidas, and colleagues (2019) evaluated the *Safety Check* and concluded that the acceptability of screening for firearms and safe storage counseling was high among primary care physicians. Goldstick and colleagues (2017) developed a 10-point screening tool for high-risk teens predicting firearm violence that might be useful in some settings (e.g., EDs). A North Carolina survey of adults whose children were seen in an ED found that parents had poor to modest concordance on firearm ownership and safety, concluding that provider-based interventions and counseling should include both partners in pediatric settings (Coyne-Beasley et al., 2005).

Literature on Firearm Safety and Safety Interventions. We identified one case-control study that found that safe firearm storage devices and practices were protective against both youth suicide and unintentional firearm injuries (Grossman, Mueller, Riedy, et al., 2005). Data from a Washington State population survey (the Behavioral Risk Factor Surveillance System [BRFSS]) (Morgan, Gomez, & Rowhani-Rahbar, 2018) indicates the potential for increased injury or suicide risk among adults with higher prevalence of alcohol misuse in firearm-owning households that have unsafe firearm storage.

To date, clinically delivered interventions to improve firearm safety have mixed results. Stevens and colleagues concluded that except for bicycle helmet use, there were no significant effects of any injury-prevention interventions in pediatric practices, including safe gun storage. Grossman and colleagues (2000) examined the effect of gun counseling in pediatric settings among physicians, nurse practitioners, and physician assistants. There were no important differences in acquisition of new guns by their patients, or removal of firearms from the home, but there was an observed increase in the proportion of their patients that purchased gun locks (8% in the intervention group, versus 2.5% among controls).

In a randomized controlled trial (information only vs. counseling), Barkin and colleagues reported a substantial increase in storing firearms with cable locks for the intervention group, compared to a decrease in the control group (Barkin et al., 2008). There may be promise in an important study funded by the NIMH. The project (Wolk & colleagues, 2017) seeks to understand provider barriers, and then test the implementation of a parental firearm safety intervention (*Firearm Safety Check*). They conducted electronic surveys of leaders of 83 primary

care practices (the survey is not available). In a follow-up study analyzing the completed surveys, Beidas and colleagues (2019) found that while acceptability for screening and counseling was generally high among primary care physicians, the provision of firearm locks did not rate highly in terms of acceptability. Primary care physicians with personal experience with suicide were more likely to find intervention strategies more acceptable. These investigators concluded that future research should be dedicated to personal experience-based narrative approaches and easier intervention implementation.

While research on clinical interventions is limited, providers and provider organizations support counseling/prevention in healthcare settings. For example, the *American Pediatric Surgical Association* (APSA) strongly supports provider counseling on firearm safety and gun control measures (Petty, Henry, Nance, Ford, & the APSA, 2019). In addition, Parent (2016) describes a generally positive effect of physician-initiated counseling, and recommends specific non-judgmental language and using objective information. He also promotes the direct conversation of firearm safety and storage. In another study of medical education and training, Puttaguna and colleagues (2016) reported results of a formal literature review on firearm safety training among students in healthcare professions, and found only four studies with limited types of learner groups. They concluded that inadequate examples of training exist, that there is very spare evidence of formal evaluations and outcomes, and that firearm safety education should be a much higher priority in healthcare.

Creating an Oregon-Based Program

Based on the sparse published reports, but knowing they provide background for best practices, we undertook a data-driven project to understand the Oregon experience for our population and healthcare providers. We made use of existing Oregon data on firearm ownership using national comparators (collected by the State in conjunction with the CDC). To understand our own healthcare providers, we also designed and conducted two original data collection efforts. We surveyed a random sample of three types of healthcare providers using licensing data. The Oregon Medical Association (OMA) was a key partner for MDs, DOs, and PAs (Doctor of Medicine, Doctor of Osteopathic Medicine, and Physician Assistant). We purchased a list of licensed nurse practitioners (NP) and nurse practitioners with dispensing privileges (DP) from the Oregon State Board of Nursing (OSBN).

Public Survey Data

A. Weapons in High School (Healthy Teens Survey Data). See Appendix I of this report for a comprehensive treatment of these data, including extensive tables that are summarized here.

Introduction/Background

School violence and injury receive national attention. Diverse studies have found an association between poor mental health outcomes and the prior experiences of violence and being abused (Johnson et al., 2002). In addition, a cross-sectional study conducted by Pickett et al., (2005) identified weapon carrying as a common indicator of physical violence in youth. In an analysis of trends of weapon carrying, the authors found that there was a statistically significant increase in the prevalence of weapon carrying between the years 1998 – 2010; this increment was, in particular, significant among White students in comparison to Black or Hispanic students (Perlus, Brooks-Russel, & Wang, 2014). These and other national issues have led to a public health priority to prevent morbidity and mortality related to school violence. Between 1991 through 2017, the Youth Risk Behavior Survey (YRBS) monitored weapon carrying among high school students. In this report, we calculated estimates from years 2007 to 2017 to characterize the prevalence of weapon carrying and students' perceptions of school safety. We also sought to compare Oregon and U.S. prevalence of weapon carrying.

To our knowledge, there are no current published data related to weapon carrying among Oregon high school students. Such information is essential for public health programs seeking to reduce school violence, bullying, and abuse. We hope that this initial report opens a dialogue about the need for documenting whether young Oregonians carry weapons to the school environment, and whether they have been threatened or injured.

Overview of the YRBS

The Youth Risk Behavior Survey (YRBS) was developed by the Centers for Disease Control and Prevention (The CDC https://www.cdc.gov/healthyyouth/) in 1990, with the objective of monitoring a wide variety of health behaviors among youth that may lead to death, impairment, or social problems. The survey is administered biannually to students in 9th and 12th grade. Among the main topics of the survey are behaviors that contribute to unintentional injuries, which includes questions related to weapon carrying, in school fighting, being threatened with a weapon, and gun carrying. The survey is administered via paper-pencil to a nationally representative sample of high-school students attending public and private schools. The national YRBS uses a cluster sample design and the national sample is designed to produce estimates that are accurate within ±5% at a 95% confidence level. Overall estimates and estimates of subgroups (gender, grade, race/ethnicity, grade by gender, and race/ethnicity by gender) subgroups meet this statistical standard.

In Oregon, we have a state version of the YRBS, the Oregon Healthy Teens Survey, which is a survey performed among 8th and 11th grade youth (OHT https://www.oregon.gov/oha/ph/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/index.aspx). The survey is conducted in odd numbered years. The OHT Survey is an anonymous and

voluntary. It is sponsored by the Oregon Health Authority (OHA) in collaboration with the Oregon Department of Education. The survey is offered in two platforms: by paper or online. The OHT uses most questions based on the YRBS, although there are some differences.

At the national level, questions related to weapon carrying, school violence, and perception of safeness in school have been included periodically in the national questionnaire (biannually for the past decade). However, because states are able to decide on the questions in their respective surveys, there is less consistency in Oregon, across all the years of analysis. The YRBS has consecutively included five questions related to weapon carrying, perception of being safe in school, and having been threatened in school grounds with a weapon.

We used *Stata 15* for all analyses to account for the complex sampling design of the YRBS and the OHT. Data from the U.S. and Oregon are currently available only for 2015 and 2017. Therefore, except for Table 1 that compares Oregon to the U.S., other tables found in Appendix I only contain information about the U.S. YRBS. We estimated the prevalence of weapon carrying, gun carrying, weapon carrying in school property, missing class because of feeling unsafe in school grounds, and having been threatened or injured with a weapon in school. We calculated 95% confidence intervals (CI) for each prevalence estimate.

Results

In 2015, the prevalence of missing class because feeling unsafe in school grounds was approximately similar in both Oregon and the U.S. (6.0% vs 5.6% respectively). In addition, around 6% of high school students in the U.S. and Oregon reported they were threatened/injured with a weapon in school during the year before the survey (see Table 1).

Additionally, Table 2 illustrates the 2017 OHT Survey update that about 5.2% of students in 8th grade and 3.3% of students in 11th grade did not go to school for one day because they felt they would be unsafe at school or on the way to school. The survey results also indicated that 4.4% of students in 8th grade and 2.6% of students in 11th grade had been threatened or injured with a weapon on school property. The results from both question one and question two indicated that a higher percentage of students in 8th grade reported having felt unsafe or having been threatened or injured while at school than students in 11th grade. This draws attention to the possible concern that students attending middle school may tend to feel or be more unsafe regarding violence on school property than students attending high school in the state of Oregon.

Table 1. Comparison of Oregon and National Data on Weapon Carrying. Youth Behavioral Risk Factor 2015				
			U.S. (respondent n=14,423)	
			%	**[95%CI]+**
1. **During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?***				
0 days			83.8	[81.9, 85.6]
3 or less days			7.1	[6.2, 8.1]
4 or more days			9.1	[8.0, 10.4]
2. **During the past 30 days, on how many days did you carry a gun?***				
0 days			94.7	[93.9, 95.4]
3 or less days			3.1	[2.6, 3.6]
4 or more days			2.2	[1.8, 2.7]
3. **During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?***				
0 days			95.9	[95.3, 96.5]
3 or less days			1.9	[1.6, 2.3]
4 or more days			2.2	[1.8, 2.7]
	Oregon (respondent n=28,740)		**U.S. (respondent n=14,423)**	
	%	**95%CI**	**%**	**[95%CI]**
4. **During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?**				
0 days	94.0	[93.5, 94.4]	94.4	[93.5, 95.2]
3 or less days	5.0	[4.6, 5.3]	4.4	[3.7, 5.2]
4 or more days	1.0	[0.95, 1.4]	1.2	[1.0, 1.5]
5. **During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?**				
0 time	94.1	[93.7, 94.5]	94.0	[93.2, 94.8]
3 or times	4.7	[4.4, 5.0]	4.2	[3.6, 4.9]
4 or more times	1.3	[1.1, 1.5]	1.8	[1.4, 2.3]
*Not asked in Oregon for 2015 and 2017				
+CI= confidence interval				

Table 2. State Data on Personal Safety among Youth. Oregon Healthy Teens Survey 2017.

1. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?

	Grade 8	**Grade 11**
	State %	*State %*
0 days	90.9	93.4
1 day	5.2	3.3
2 or 3 days	2.4	2.2
4 or 5 days	0.6	0.5
6 or more days	0.9	0.6

**Percentages exclude missing answers*

2. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?

	Grade 8	**Grade 11**
	State %	*State %*
0 times	91.6	94.8
1 time	4.4	2.6
2 or 3 times	2.2	1.4
4 or 5 times	0.6	0.3
6 or 7 times	0.3	0.1
8 or 9 times	0.2	0.2
10 or 11 times	0.1	0.1
12 or more times	0.6	0.4

**Percentages exclude missing answers*

Additional questions available by CDC, and could be added to our Oregon survey on a periodic basis to gauge potential risk in Oregon Schools. See Appendix I for these additional survey questions on weapon carrying and firearms, specifically.

B. Prevalence of Firearm Ownership and Storage (Behavioral Risk Factor Surveillance System Data) See Appendix II of this report for a compressive treatment of these data, including extensive tables summarized here.

Introduction / Background

Firearms injuries are one of the leading causes of death in the U.S. (Murphy SL, Xu J, Kochanek KD, Curtin SC, & Arias E, 2017). According to previous research, more than 50% of firearms injuries are related to suicide and injuries related to homicides account for nearly 40% of all firearm deaths; a remaining small proportion of firearm related-deaths are due to unintentional injuries (Okoro CA et al., 2002). A population study during the years 1981 – 2002 found that higher rates of firearm ownership are associated with higher rates of overall suicide (Miller M, Azrael D, Hepburn L, Hemenway D, & Lippmann SJ, 2006). Therefore, firearm-related morbidity and mortality are important pressing issues in public health. During the past decades, the Behavioral Risk Factor Surveillance System (BRFSS) has monitored information regarding household firearm prevalence and firearm storage practices. In this report, we compare the prevalence of household firearm ownership and storage practices between Oregon and the U.S. for the years with available data.

As described in the OHSU project report "Gun Violence as a Public Health Issue [2018]", Oregon experiences an average of 456 deaths each year due to gun-related injuries. The majority of these deaths are due to suicide. Underlying these deaths is the question of availability of firearms in Oregon, and the potential safety risks of these firearms (Center for Diversity and Inclusion, 2018).

Overview of the BRFSS

In the U.S states and its territories, survey data help define the health and health behaviors, and health risks of the population. The BRFSS is an annual telephone survey that asks about health, behaviors that affect health, and access to health care. It is supported by the Centers for Disease Control and Prevention [the CDC. Documentation at https://www.cdc.gov/brfss]. The survey includes random U.S. residents, meaning that any resident has the same probability to be called. However, some groups of people are not included. For example, children under the age of 18 and people who reside in an institution, such as a jail or nursing home, are not included in the survey. People who do not have a telephone or who do not speak English or Spanish are also not included. Although overall, approximately 95 percent of U.S. households have telephones, coverage ranges from 87 to 98 percent across states and varies for subgroups as well. A method known as post-stratification weighting is used, which partially corrects for bias caused by non-telephone coverage. The statistical weights are always applied in analyses to produce representative population-based statistics.

At the national level, BRFSS questions about firearms have been included periodically in the U.S. as a whole, and in Oregon. In this report, we provide the result of the BRFSS firearms questions for Oregon, and also for the entire U.S. for the years 2001, 2002, and 2004. There were a total of three questions during the years 2002 and 2004 and two additional CDC computed

variables were available in 2002. The year 2001 only included one question related to firearm ownership prevalence. The CDC surveys are listed in their entirety in Appendix II.

We used *Stata 15* for all analyses to account for the complex sampling design of the BRFSS and to calculate 95% confidence intervals (CI) for prevalence percentages. Data from all states were averaged to produce the nationally representative sample statistics. We compared the U.S. and Oregon estimates using a chi-squared statistics test. We compared national and local prevalence of adults with household firearms, loaded firearms, and unlocked firearms.

Results

In 2001, the national prevalence of household firearm ownership was estimated to be 31.7% (95% CI: 31.4 – 32.1%) in comparison to 39.8% in Oregon (95% CI: 37.7 – 42.2%), which means that the prevalence of firearms in Oregon was 1.3 times larger than the national prevalence. This finding was highly statistically significant ($p<0.00001$) (Table 1).

Table 1. Comparison of Oregon and National Data on Firearms. BRFSS 2001

	Oregon (respondent n=2,433)		**U.S.** (respondent n=201,881)	
Variable	%[3]	[95%CI][4]	%[3]	[95% CI][4]
1. Are any firearms kept in or around your home?[1]				
Yes	39.8	[37.7, 42.0]	31.7	[31.4, 32.1]
No	59.7	[58.0, 62.3]	68.3	[67.9, 68.6]
		$p^2= 0.0001$		

[1]This question was asked of all survey respondents.
[2] p-values were calculated using a chi-square test comparing Oregon percentages to the U.S.
[3] Weighted column percentages [4] 95% Confidence Intervals.

When stratifying by gender, Oregon men were 26% more likely to keep a firearm around the house in comparison to U.S. men. Similarly, the prevalence of firearm was higher among men than women for both Oregon and the U.S. For example, 48.4% of men in Oregon reported having a firearm around the house while only 32% of women did so (Table 2). Additionally, the prevalence of household gun ownership was almost double among White Oregonians in relation to other racial and ethnic groups (e.g., Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders): during 2001, 42.9% of White Oregonians reported having a firearm at home in comparison to only 23.8% of other racial/ethnic groups.

Table 2. Comparison of Oregon and National Data on Firearms. Stratification by Gender and Race/Ethnicity. BRFSS 2001

	Oregon				U.S.			
	Women		Men		Women		Men	
	%[2]	[95%CI][3]	%[2]	]95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Are any firearms kept in or around your home?[1]								
Yes	32.0	[29.3,34.7]	48.4	[45.0,51.7]	26.0	[25.57,26.36]	38.2	[37.61,38.72]
No	68.0	[65.3,70.7]	51.6	[48.3,55.0]	74.0	[73.64,74.43]	61.8	[61.28,62.39]

	Oregon				U.S.			
	White		Other Groups[4]		White		Other Groups[4]	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Are any firearms kept in or around your home?[1]								
Yes	42.9	[40.54,45.26]	23.8	[19.38,28.93]	38.1	[37.67,38.44]	16.5	[15.95,17.1]
No	57.1	[54.74,59.46]	76.2	[71.07,80.62]	61.9	[61.56,62.33]	83.5	[82.9,84.05]

[1]This question was asked of all survey respondents.
[2] Weighted column percentages [3] 95% Confidence Intervals.
[4] Other race & ethnic groups include Hispanics, Blacks, Asians, Native Americans, & Pacific Islanders.

In 2004, all three questions were asked. The national prevalence of household firearm ownership was estimated to be 32.3% (95% CI: 32.0 – 32.7%) in comparison to 39.8% in Oregon (95% CI: 38.2 – 41.5%), which means that the prevalence of firearms in Oregon was over 1.2 times larger than the national prevalence. This finding was statistically significant ($p<0.00001$). In addition, the proportion of respondents that answered yes to whether the firearms were loaded was 22.5% (95% CI: 22.0 – 22.9%) for the national sample compared to 25.8% (95% CI: 23.4 – 28.4%) in Oregon. Furthermore, 60.7% (95% CI: 59.4 – 61.9%) of respondents in the national sample affirmed that the loaded firearms were unlocked in comparison to 64.4% (95% CI: 58.9 – 69.5%) of Oregon respondents. These findings were also statistically significantly higher for Oregon (Table 3).

In the 2004 gender analysis, Oregon men were 17.5% more likely to keep a firearm around the house compared to U.S. men. Similarly, the prevalence of firearm ownership was higher among men than women for both Oregon and the U.S. Additionally, the prevalence of household gun ownership was twice as likely among White Oregonians in relation to other racial and ethnic groups (e.g., Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders). Furthermore, during 2004 white Oregonians were more likely to be at risk for living in a home with loaded and unlocked firearms in comparison to Oregonians from other racial groups. Almost ten percent of Oregonian men were living in a home with loaded and unlocked firearms in comparison to 6.3% of men in the rest of the U.S.

Table 3. Comparison of Oregon and National Data on Firearms. BRFSS 2004

	Oregon (respondent n=4,814)		**U.S.** (respondent n=285,884)	
Variable	%[5]	[95%CI][6]	%[5]	[95% CI][6]
1. Are any firearms kept in or around your home?[1]				
Yes	39.8	[38.2, 41.5]	32.3	[32.0, 32.7]
No	60.2	[58.5, 61.8]	67.7	[67.3, 68.0]
		p[4]= 0.0001		
2. Are any of these firearms now loaded?[2]				
Yes	25.8	[23.4, 28.4]	22.5	[22.0, 22.9]
No	74.2	[71.6, 76.6]	77.5	[77.1, 78.0]
		p[4]= 0.005		
3. Are any of these loaded also unlocked?[3]				
Yes	64.4	[58.9, 69.5]	60.7	[59.4, 61.9]
No	35.6	[30.5, 41.1]	39.3	[38.1, 40.6]
		p[4]= 0.185		

[1]This question was asked of all survey respondents.
[2] This question was only asked of respondents who answered affirmatively to question 1. Calculations were based on a sample of 102,896 respondents for U.S. & 1,786 respondents for Oregon.
[3] This question was only asked to respondents who answered affirmatively to questions 1 & 2: Calculations are based on a sample of 22,555 respondents for U.S. & 439 respondents for Oregon.
[4] p-values were calculated using a chi-square test comparing Oregon percentages to the U.S.
[6] Weighted column percentages [7] 95% Confidence Intervals.

In general terms, Oregon households were consistently and statistically significantly more likely to report firearms in the home. They also reported guns were more likely to be loaded, and these guns were less likely to be locked compared to the respondents from national household data. However, newly released data from the CDC indicate the trend reversed for the year 2017. In 2017, the prevalence of firearm ownership in Oregon was 40.0%, similar to the year 2004 (39.8%). In addition, there was no statistically significance difference between Oregon and the rest of the U.S. in the prevalence of household firearm ownership. In 2017, Oregonians were less likely to live in homes with loaded firearms with respect to other U.S. adults (12.2% vs 18.1% respectively) (Table 4).

In the 2017 gender analysis, Oregon men were as likely to keep a firearm around the house as other U.S. men. Consistent with earlier years, the prevalence of firearm ownership was higher among men than women for Oregon and the U.S. The prevalence of household gun ownership was 85% more likely among White Oregonians compared to other groups (e.g., Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders). Furthermore, white Oregonians were more likely to be at risk for living in a home with loaded and unlocked firearms compared to Oregonians from other racial and ethnic groups. Although the proportion of Oregonians living in a home with a loaded and unlocked firearm was lower than the nation (for the year 2017), at least 6% of Oregonians were at risk.

Table 4. Comparison of Oregon and National Data on Firearms. BRFSS 2017

Variable	**Oregon** (respondent n=3,940) %[5]	[95%CI][6]	**U.S.** (respondent n=285,884) %[5]	[95% CI][6]
1. Are any firearms kept in or around your home?[1]				
Yes	40.0	[38.2, 41.9]	39.6	[32.0, 32.7]
No	60.0	[58.1, 61.8]	67.7	[67.3, 68.0]
		p[5]= 0.7737		
2. Are any of these firearms now loaded?[2]				
Yes	30.8	[28.2, 33.6]	46.3	[42.9, 49.8]
No	69.2	[66.4, 71.8]	53.7	[50.2, 57.1]
		p[5]= 0.0001		
3. Are any of these loaded also unlocked?[3]				
Yes	49.3	[44.2, 54.4]	58.0	[52.8, 63.0]
No	50.7	[45.6, 55.8]	42.0	[36.9, 47.2]
		p[5]= 0.0189		
4. Living in home with loaded firearm.[4]				
Not at risk	87.8	[86.6, 89.0]	81.9	[80.2, 83.5]
At Risk	12.2	[11.0, 13.4]	18.1	[16.5, 19.8]
		p[5]= 0.0001		
5. Living in home with loaded and unlocked firearm.[4]				
Not at Risk	94.0	[93.2, 94.8]	89.6	[88.2, 90.9]
At Risk	6.0	[5.2, 6.8]	10.4	[9.2, 11.8]
		p[5]= 0.0001		

[1]This question was asked of all survey respondents.
[2] This question was only asked of respondents who answered affirmatively to question 1. Calculations were based on a sample of 6,006 respondents for U.S. and 1,538 respondents for Oregon.
[3] This question was only asked to respondents who answered affirmatively to questions 1 and 2: Calculations are based on a sample of 1462 respondents for U.S. and 255 respondents for Oregon.
[4] Calculated CDC variables (see explanation in text report).
[5] p-values were calculated using a chi-square test comparing Oregon percentages to the U.S.
[6] Weighted column percentages [7] 95% Confidence Intervals.

During 1996-1998, the national data do not allow comparison by states, but the prevalence of firearms in households was fairly consistent at about 32%. Also during these three years, respondents were asked detailed questions: while not specific to Oregon, the data are interesting and cover issues such as multiple types of firearms, carrying a loaded firearm, reason for having firearms, confronting someone with a firearm, and if respondents had firearm safety training. These data are included in Appendix II. These additional BRFSS questions may provide useful information about Oregonians and firearms and firearm safety in the future. For next steps in this research, asking similar questions on surveys taken throughout Oregon would be helpful to understanding how Oregonians relate to firearm ownership. This would enable more in-depth research on the various discrepancies that may exist among rural and non-rural populations pertaining to the culture of firearm ownership, storage, and training.

Survey of Oregon Healthcare Providers

Introduction

This section focuses on our healthcare provider survey. The primary aims of the survey were to: 1) understand Oregon healthcare providers' clinical experiences with firearm injuries; 2) determine past training regarding firearm safety; and 3) determine their perspectives on the role they believe they should play in firearm safety. Appendix III of this report provides a comprehensive report, including detailed tables that are summarized here. This work was funded jointly by the Oregon State Legislature and OHSU's Office of the Provost.

Survey Study Methods

Study Design and Population Sample -This cross-sectional study involved administering a survey about firearm experiences and safety to a weighted sample of 6,972 physicians, physician assistants, and nurse practitioners. The weighted sample was derived from approximately 13,900 allopathic and osteopathic physicians (DOs); 1,800 physician assistants; and 3,200 nurse practitioners licensed to practice within Oregon. Physician and physician assistant participants were those licensed to practice in Oregon at the time of the survey who we selected using our sampling framework (Table 1). The nurse practitioner sampling framework is included in Table 2. We excluded dentists, podiatrists, naturopathic, chiropractic physicians, and nurses who were not nurse practitioners. In addition, physician specialties with limited direct clinical patient interactions were also excluded (e.g., nuclear medicine). The Oregon Medical Association (OMA) enabled access to the contact information they maintain on licensed MDs, DOs, and PAs. The Oregon State Board of Nursing (OSBN) provided access to their contact information on licensed nurse practitioners (NP) and nurse practitioners with dispensing privileges (DP). We selected a random sample of providers based on disciplines.

Survey Design and Development. Using the results of the literature review, we developed a 53-item survey with three sections: 1) Demographic and practice information; 2) Information about firearms in your community; and 3) Information about experiences with firearms and firearm safety (See Appendix III). Because survey length can affect response rates, we sought to keep the survey short enough to complete in about 10 minutes. After reviewing, selecting items, and engaging key stakeholders for review of the survey draft, we used cognitive interviewing techniques (Willis GB, 2004) to test the survey with every respondent type. Undertaking this step allowed us to be confident the items were understandable by different types of healthcare providers; that the question order was not leading or did not introduce bias into responses; and estimated the time for survey completion. We completed four rounds of cognitive interviews before finalizing the survey.

Table 1. Physician and Physician Assistant Sampling Framework for Firearm Survey

Physician Medical Specialties (American Board of Medical Specialties)†	**Included (Yes/No)**	**Rationale for Exclusion**	**Weights**
Allergy and Immunology (n=40) n=12	Yes		*
Anesthesiology	**No**	Limited patient interaction	--
Colon and Rectal Surgery (n=16) n=5	Yes		*
Dermatology (n=220) n=66	Yes		*
Emergency Medicine (n=1006) n=604	Yes		***
Family Medicine (n=2395) n=1078	Yes		**
Internal Medicine (n=2630) n=1184	Yes		**
Medical Genetics and Genomics	**No**	Patient care spectrum too narrow	--
Nuclear Medicine	**No**	Patient care spectrum too narrow	--
Neurology (n=246) n=74	Yes		*
Neurological Surgery (n=160) n=48	Yes		*
Obstetrics and Gynecology (n=617) n=185	Yes		*
Ophthalmology (n=350) n=105	Yes		*
Otolaryngology – Head and Neck Surgery (n=266) n=120	Yes		**
Orthopedic Surgery (n=591) n=266	Yes		**
Pathology	**No**	Limited patient interaction	--
Pediatrics (n=976) n=293	Yes		*
Physical Medicine and Rehabilitation (n=137) n=62	Yes		**
Plastic Surgery (n=90) n=41	Yes		**
Preventive Medicine (n=22) n=13	Yes		***
Psychiatry (n=42) n=19	Yes		**
Radiology	**No**	Limited patient interaction	--
Surgery (n=3) n=2	Yes		***
Thoracic Surgery (n=69) n=31	Yes		**
Urology (n=183) n=55	Yes		*

†Sampling could change based on # represented in Oregon
Random sample 30% of disciplines with *.
Random sample 45% of disciplines with **
Random sample 60% of disciplines with ***

Table 2. Nurse Practitioner Sampling Framework for Firearm Surv**ey**

Nurse Practitioner Specialties According to the OSBN	Include (Yes/No)	Rationale for Exclusion	Weights
Acute (n=86 or 2%) n=52	Yes	N/A	***
Adult (n=347 or 7.5%) n=156	Yes	N/A	**
Adult-Gerontology Acute Care (n=87 or 2%) n=26	Yes	N/A	*
Adult-Gerontology Primary Care (n=131 or 2.8%) n=59	Yes	N/A	**
Family (n=2,532 or 54.7%) n=1,139	Yes	N/A	**
Geriatric (n=35 or 1%) n=16	Yes	N/A	**
Neonatal (n=62 or 1%) n=19	Yes	N/A	*
Nurse midwife (n=361 or 8%) n=162	Yes	N/A	**
Pediatric (n=123 or 2.7%) n=55	Yes	N/A	**
Pediatric acute care (n=11 or <1%)	**No**	Group too small for meaningful data	--
Pediatric Primary Care (n=51 or 1%) n=23	Yes	N/A	**
Psychiatric/Mental Health (n=676 or 14.6%) n=304	Yes	N/A	**
Women's health (n=127 or 2.7%) n=57	Yes	N/A	**
Total (n=4,629) n=2,073 or 44.8% overall			

Random sample 30% of disciplines with *
Random sample 45% of disciplines with **
Random sample 60% of disciplines with ***

Recruitment Activities and Survey Administration. We compiled provider contact information, including e-mail addresses, from the OMA for physicians and physician assistants, and from the OSBN for nurse practitioners. Both associations and OHSU completed Letters of Agreement. We contacted prospective participants by e-mail and invited them to complete the survey. The e-mail included the following: a cover letter from Elena Andresen, OHSU Provost; an information sheet that described the survey study in detail; and a link to the survey, using Qualtrics^{xm} an online survey platform. OHSU's Institutional Review Board approved all study activities (IRB #19714). We planned up to four participant contacts with a goal of a response rate of 75%. The survey was launched on October 22nd, 2019 and closed on March 16th, 2020.

Challenges with Survey Response Rates and Our Plans. Based on the peer-reviewed literature, we recognized that survey response would be a challenge for our Oregon study. For example, Butkus and Weisman (2014) reported 56.5% response from internists at the national level. Hersh and Goldenberg (2016) sent surveys to 1,529 primary care physicians in 29 states with 20% response. As reported above, the AAP reported decreasing response: 69% in 1994 dropping to 44% in 2013. In general, survey response rates (via paper or online, as in the AAP described above) have decreased.

Because of the limited published success with provider surveys, we adopted several strategies to improve response rate. First, we used current email addresses as a first-line (low

cost) web-based survey delivery mode. We followed with more intensive efforts using regular mail methods. Second, we limited our Oregon State provider survey population to physicians and two larger groups of advanced practice providers: PAs and NPs. This reduced the potential for small subgroups where we might not be able to interpret data accurately. Third, we used a sampling strategy to survey a smaller but representative sample of providers, to maximize our efforts of increasing response with more intensive follow-up in a smaller sample. We used a weighted sampling frame, where smaller groups (e.g., preventive medicine physicians; acute care NPs) were randomly sampled at a higher rate, e.g., 60% of their number, and larger groups (e.g., pediatric physicians) were sampled at 30% of their number. In total, we sampled almost 5,000 healthcare providers in these groups out of about 19,000 licensed members of these professions. Finally, we collaborated with the OMA, whose support included their logo on our survey invitations. The OMA members also developed a deep interest in firearm safety, and helped develop and legitimize the survey.

Data Analyses. We used Analysis of Variance (ANOVA) mixed model to assess continuous variables, and Chi Square assessed categorical variables. All tests were two-sided, and alpha was set at 0.05 to assess statistical significance. Missing information was less than 5%. To explore gun ownership and safety perceptions in rural versus urban settings, we collapsed the categories of village, small town, and large town into a rural category; and small and large city into an urban category. Data table cells with a count under five were censored (shown as … in tables) to prevent possible identification of participants.

Results

Response Rates and Participants. A total of 5,563 surveys were administered, with up to four reminders sent to non-responders. Partially and fully completed surveys were returned by 589 participants (10.6% response) (Table 3).

Table 3. Firearm Survey Response Rates According to Type of Healthcare Provider

Type of Healthcare Provider	Number (n) (Column %)	n for Full Survey Responses (Row %)	n for Partial Survey Responses (Row %)
MD/DO	441 (74.9%)	340 (77.1%)	101 (22.9 %)
NP	121 (20.5%)	87 (71.9%)	34 (28.1%)
PA	27 (4.6%)	19 (70.4%)	8 (29.6%)
TOTALS	*589 (100%)*	*446 (100%)*	*143 (100%)*

The mean respondent age was 48.6 years, with a range of 28-82. A slight majority were women (51.4%), and the respondents were a majority White (84.3%), non-Hispanic (96.5%), and have children living at home (55.2%). We found statistical differences for gender identity, race, and parental status according to healthcare discipline. Physician participants completed their training between 1968 and 2019 with a mean year of completion of 2003 (standard deviation [SD] =11.9 years), and nurse practitioners and physician assistants completed their training between 1974 and 2018 with a mean year of completion of 2006 (SD=10.4 years).

Table 4 illustrates characteristics of the practice settings among participants according to type of healthcare provider. Although outpatient volume did not vary among types of healthcare providers, type of care provided did: NPs and PAs provided more outpatient care compared to physicians.

Table 4. Patient and Community Characteristics Where Participants' Provide Care

Patient/Community Characteristics	**All**	**MD/DO**	**NP**	**PA**	***p value***
	Means as % and (SD) except where otherwise noted				
Estimate patient payment methods in your setting	n=486	n=361	n=103	n=22	
Private health insurance	30.1 (41.2)	30.5 (45.0)	29.1 (29.2)	29.1 (18.4)	0.95
Medicare	17.6 (18.6)	17.8 (18.5)	16.5 (19.9)	20.4 (14.0)	0.64
Medicaid	21.8 (24.0)	20.1 (22.9)	26.0 (27.3)	30.5 (21.2)	**0.02**
Other Federal (e.g., Veterans' Affairs)	4.6 (16.9)	4.6 (16.8)	5.2 (19.0)	2.1 (4.0)	0.74
Uninsured	7.5 (47.0)	7.8 (53.7)	6.3 (15.4)	9.6 (21.3)	0.94
Other	3.1 (15.9)	3.7 (17.1)	1.07 (9.9)	3.9 (18.1)	0.33
Unable to estimate payment methods	n=118	n=90	n=26	n=2	--
Patient population's ethnicity	n=487	n=361	n=104	n=22	
Hispanic or Latino	17.9 (15.1)	17.7 (15.5)	18.3 (13.1)	18.3 (17.5)	0.95
Non-Hispanic or Non-Latino	82.1 (15.5)	82.3 (15.5)	81.7 (13.1)	81.7 (17.5)	
Patient population's race	n=487	n=361	n=26	n=22	
White	78.4 (18.7)	78.3 (19.3)	77.5 (17.5)	83.9 (13.5)	0.34
Black or African American	6.1 (6.6)	6.1 (6.6)	6.3 (7.0)	5.5 (5.9)	0.87
Asian/Pacific Islander	5.5 (5.5)	5.2 (5.2)	6.7 (6.6)	3.7 (3.0)	**0.02**
American Indian/Alaska Native	2.6 (4.5)	2.7 (4.9)	2.5 (3.2)	1.6 (2.6)	0.49
Two or more races	2.5 (8.6)	2.8 (9.6)	2.1 (4.4)	0 (0.0)	0.28
Other	4.9 (15.3)	4.9 (15.5)	4.9 (15.2)	5.2 (12.7)	0.99
Community Size in Detail	n=487	n=361	n=104	n=22	
	n (%)	n (%)	n (%)	n (%)	
Village	…	…	…	…	
Small town	78 (16.0)	47 (13.0)	25 (24.0)	6 (27.3)	**0.03**
Large town	130 (26.7)	100 (27.7)	25 (24.0)	5 (22.7)	
Small City	95 (19.5)	72 (19.9)	16 (15.4)	7 (31.8)	
Large City	183 (37.6)	142 (39.3)	37 (35.6)	…	
Community Size Collapsed	n=487	n=361	n=104	n=22	
	n (%)	n (%)	n (%)	n (%)	0.25
Rural	209 (42.9)	147 (40.7)	51 (51.0)	11 (50.0)	
Urban	278 (57.1)	214 (59.3)	53 (49.0)	11 (50.0)	
… cell contains less than 5 respondents					

Perspectives on Firearm Use and Safety in Patient Catchment Area

Table 5 illustrates participants' perspectives on firearm use and safety in their patient catchment areas. Participants estimated that between 44% and 49% of households in their catchment area have firearms, and between about 35% and 53% have different types of firearms from shotguns (36.5%) to handguns (45.5%), with a range of purposes, including hunting (55.7%), personal protection (54.3%), target shooting (40.2%) and gun collecting (28.2%). The data show that healthcare providers lack awareness of existing programs to prevent firearm injuries, including emergency gun storage, free gunlocks, and cables.

We also compared provider perspectives regarding firearm use and safety according to collapsed categories of rural and urban settings. Providers perceived that all gun types were more likely to be owned in rural settings and for all purposes (hunting, protection, target shooting and collecting). Providers considered awareness of gun safety programs/devises as more likely in urban settings.

Many provider respondents had experience treating firearm injury (61.6%). Physicians were statistically more likely than NPs and PAs to have treated firearm injuries (69.6% compared to 34% and 55%, respectively). The majority of injuries were due to crime related shootings (33.6%) with minor accidental shootings at 31% and self-harm at 15.7%.

Table 5. Healthcare Providers Perspectives Regarding Firearm Use

Perspectives Regarding Firearm Use	All	MD/DO	NP	PA	*p* value
	Number- n (%) unless otherwise noted				
Estimated percent of households in your practice catchment area that have firearms	n=326 Mean (SD) 45.7 (27.5)	n=239 Mean (SD) 44.3 (26.9)	n=69 Mean (SD) 49.8 (29.3)	n=18 Mean (SD) 49.2 (28.3)	0.30
Unable to estimate this number	n=219 40.2%	n=163 40.5%	n=49 23.1%	n=7 28.0%	
*Estimate of the types of firearms owned **	n=589	n=441	n=121	n=27	
Handguns	268 (45.5)	207 (53.1)	51 (42.1)	10 (37.5)	
Rifles	258 (43.8)	199 (45.1)	47 (38.8)	12 (44.4)	--
Shotguns	215 (36.5)	163 (37.0)	42 (34.7)	10 (37.0)	
Don't know	66 (11.2)	51 (11.6)	7 (5.8)	2 (7.4)	
Other	11 (1.9)	8 (1.8)	2 (1.7)	1 (3.7)	
*Estimate of firearm purpose **	n=589	n=441	n=121	n=27	
Hunting	328 (55.7)	245 (55.6)	68 (56.2)	15 (55.6)	
Personal protection	320 (54.3)	238 (54.0)	67 (55.4)	15 (55.6)	
Recreational target shooting	237 (40.2)	182 (41.3)	45 (37.2)	10 (37.0)	--
Gun collecting	166 (28.2)	129 (29.3)	30 (24.8)	7 (25.9)	
Don't know	178 (30.2)	125 (28.3)	45 (37.2)	8 (29.6)	
Other	11 (1.9)	9 (2.0)	1 (0.8)	1 (3.7)	
Awareness of existing programs: *Emergency Gun Storage*	n=486	n=362	n=103	n=21	
Yes, this exists	64 (13.2)	48 (13.3)	15 (14.6)	1 (4.8)	0.56
No, this does not exist	34 (7.0)	24 (6.6)	7 (6.8)	3 (14.3)	
I don't know whether this exists	388 (79.8)	290 (80.1)	81 (78.6)	17 (81.0)	
Awareness of existing programs: Free Child Safe Gun Locks	n=485	n=362	n=102	n=21	
Yes, this exists	138 (28.5)	105 (29.0)	27 (26.5)	6 (28.6)	0.77
No, this does not exist	15 (3.1)	13 (3.6)	2 (2.0)	0 (0)	
I don't know whether this exists	332 (68.5)	244 (67.4)	73 (71.6)	15 (71.4)	
Awareness of existing programs: Tom Sargent Ctr. Free Gun Cable Locks	n=482	n=358	n=103	n=21	
Yes, this exists	44 (9.1)	35 (9.8)	8 (7.8)	1 (4.8)	0.86
No, this does not exist	15 (3.1)	10 (2.8)	4 (3.9)	1 (4.8)	
I don't know whether this exists	423 (87.8)	313 (87.4)	91 (88.3)	19 (90.5)	
** Categories not mutually exclusive*					

A majority of healthcare providers had some experience with firearm injury prevention training. However, just over 40% of respondents reported never receiving any time of firearm injury prevention training, and 70.3% reported that their health professions training did not include training on how to counsel patients on firearm injury prevention. About 52% of respondents reported feeling not at all confident or somewhat confident when counseling young adult or older adult patients about firearm injury prevention, even though nearly 62% have treated firearm injuries. Nearly 34% reported owning a firearm, 5.6% reported being a member of the NRA and about 75% reported it would be very or extremely important to have a federal plan to prevent firearm related violence.

Table 6 illustrates the firearm injury assessment behaviors that healthcare providers reported using. Most providers (between 83% and 95%) reported doing not assessing every adolescent or adult patient they see about firearm injury prevention. Nearly 44% indicated that a known mental health issue, issues related to drugs or alcohol in the home (26.5%), or having children in the home (25.6%) are criteria they use to determine if patient counseling is needed for firearm injury prevention. On average, respondents reported that about 27% of their patients would benefit from firearm injury prevention, though only about 20% actually reported counseling these patients. Greater than 48% of healthcare respondents think counseling is very important or extremely important.

Table 6. Firearm Injury Prevention Assessment Behaviors According to Type of Healthcare Provider

Firearm Injury Prevention Assessment Behaviors	**All**	**MD/DO**	**NP**	**PA**	***p* value**
	Number- n (%)				
% Patients/ family members you assessed who you think would benefit firearm injury prevention (yes)	n=360 26.8 (*32.0*)	n= 275 25.7 (*31.9*)	n= 68 31.7 (*34.5*)	n=17 24.7 (*23.6*)	0.38
% Patients/ family members you council about injury firearm prevention (yes)	n=360 19.8 (27.1)	n= 276 17.4 (25.13)	n=67 30.4 (33.3)	n=17 17.5 (20.9)	**0.002**
Importance of counseling patients about firearm injury prevention	n=451	n=344	n=87	n=20	
Not at all Important	27 (6.0)	25 (7.3)	…	…	
Somewhat Important	96 (21.3)	77 (22.4)	16 (18.4)	…	0.19
Moderately Important	109 (24.2)	86 (25.0)	17 (19.5)	6 (30.0)	
Very Important	128 (28.4)	87 (25.3)	34 (39.2)	7 (35.0)	
Extremely Important	91 (20.2)	69 (20.1)	18 (20.7)	…	
Assesses every family member, adolescent or adult patient for firearm injury prevention (yes)	n= 451 51 (11.3)	n= 344 35 (10.2)	n=87 15 (17.2)	n=20 1 (5.0)	0.12
* Categories are not mutually exclusive. … cell contains less than 5 respondents					

Providers reported that the major issues that prevent healthcare providers from counseling patients about firearm injuries were lack of time (26.3%), patients not being open to counseling (17.8%), and forgetting to do it (21.1%). A small percentage (5.9%) did not provide counseling because they felt it was not effective, and/or they did not think it was their responsibility (7.5%). Many respondents thought (46.7%) that developing a practice-based

protocol to address firearm injury prevention with patients would be helpful to them. Table 7 details educational content that healthcare providers think would help them do a better job addressing firearm injury prevention. Counseling/educating high-risk patients/families on gun safety to help reduce their risk was most commonly mentioned, and webinar or online programs (47.4%) were favored for educational processes. The educational areas listed here provide a guide to what might be included in a future Oregon-centric provider training program.

Other insights from respondents regarding firearm injury prevention included that only about 10% distribute written materials on firearm prevention. About 40% believe that the lack of firearm injury prevention moderately or completely affects their patients and families in negative ways and nearly 60% thought this affected their communities in negative ways. Nearly 70% of respondents do not feel well prepared to address firearm injury prevention, indicating more work is needed in this area.

Table 7. Preferred Educational Programming for Healthcare Providers

Preferred Educational Programming	**All**	**MD/DO**	**NP**	**PA**	*
	Number- n (%)				
What educational content areas would help you address firearm injury prevention?	n=589	n=441	n=121	n=27	
How to identify at risk patients & families	269 (45.7)	197 (44.7)	59 (48.8)	13 (48.1)	
How to counsel/educate high-risk patients/families on gun safety to help reduce their risk.	296 (50.3)	215 (48.8)	69 (57.0)	12 (44.4)	
Specific information on laws & restrictions on gun ownership	278 (47.2)	210 (47.6)	56 (46.3)	12 (44.4)	
Specific information on firearm handling and storage	256 (43.5)	189 (42.9)	55 (45.5)	12 (44.4)	
Having a better understanding of firearm owner culture & how best to approach patients on this topic	245 (41.6)	179 (40.6)	57 (47.1)	9 (33.3)	
What types of educational approaches work best for you?	n=589	n=441	n=121	n=27	
In person sessions with guest speakers	235 (39.9)	163 (37.0)	57 (47.1)	15 (55.6)	
Webinar/Online program	279 (47.4)	207 (46.9)	60 (49.6)	12 (44.4)	
Other	45 (7.6)	40 (9.1)	…	…	

* Respondents checked all that apply

Summary and Recommendations

This survey of healthcare providers included 589 Oregon respondents, one of the larger such surveys in the U.S. to date. However, the response rate was low (10.6%) despite multiple contacts. The results are useful in describing limited prior training for firearm safety, if any, among health care providers, which if they had received could help them counsel their patients. The majority of healthcare providers did not assess whether their patients or families would benefit from firearm injury prevention, yet expressed interest in having these skills. Injury prevention and health promotion are traditional parts of provider-patient visit conversations. Most respondents thought that developing a practice-based protocol to address firearm injury prevention with patients would be helpful to them: examples are electronic health records, or flow sheets. To achieve a reduction in firearm injury based on healthcare providers, the state could develop an Oregon-centric public health program with a strong central planning and evaluation component, and include free and responsive provider training and substantial access to other referral resources (e.g., gunlocks and firearm safes).

Focus Groups with Oregon Healthcare Providers

Introduction

Suicide and homicide are critical and increasing public health issues in the United States (US) and in Oregon. In Oregon, the majority of firearm deaths are suicides followed by homicides; with males more than six times more likely than females to die from a firearm injury (Shen, 2016. On average, at least one Oregonian dies from a firearm injury every day (Shen, 2016).Researchers recognize that firearm fatalities are preventable – and yet despite national efforts to reduce the rates of suicide, there has been no evidence of an overall decrease in suicide deaths or suicide attempts in the US. In fact, from 1999-2014, deaths by suicide in the US have increased steadily in both men and women. In 2017 more than 47,000 people died by suicide, at a rate of 14.5 per 100,000 people. In Oregon, this rate is higher, with 19.9 suicide deaths per 100,000 people (Drapeau & McIntosh 2018). From 2008 – 2017 the homicide rate was 9.6 per 100,000, with death rates peaking in 2015 (Oregon Violent Death Reporting System, 2020).

These concerning numbers have given rise to many calls for healthcare providers, public health specialists, and state and federal governmental agencies to respond to a growing crisis. This current research was conducted to understand the role and current capacity of physicians and other healthcare providers to respond to both potential and actual violence that results from firearms.

This research is situated in a cross section of the literature that demonstrates three conditions are present in suicide and suicide prevention. First, that means restriction, or "the limitation of access to lethal means used for suicide (Yip et al. 2012)",is an empirically tested method of preventing deaths by suicide (WHO 2014; Florentine & Crane 2010). Second, firearms account for over 50% of deaths by suicide in the United States. That means that safety measures specific to firearms may reduce suicide by firearms. The protective means include safe storage(firearms are unloaded, in a secure location such as a gun safe, with cable or trigger locks, with ammunition stored separately), or having someone temporarily hold the firearms outside of the home during times of elevated risk are frequently not implemented in Oregon (Marino, 2016). Third, 64% of those who die by suicide in the US have had contact with their primary care provider within a year of death (Ahmedani, et al 2014) and 45% within a month of death (Luoma, et al, 2002). Because of these three conditions, and because broadly speaking firearm violence is a public health issue, OHSU and researchers at Oregon State University-Cascades conducted a set of focus groups to understand the role, challenges, and opportunities physicians and other healthcare providers (Physician Assistants, Nurse Practitioners) may experience when intervening and preventing violence linked to firearms. (For the purposes of this report, when the term "provider" is used, it includes all three provider types).

Drs. Marino and Keys have worked previously with firearm owners trying to understand if they would remove firearms from a home when there was an increased chance of suicidal ideation or severe depression. They also investigated if they would feel comfortable talking with their primary care physicians and/or other healthcare providers about firearms as a safety issue (Marino et. al 2016; Marino et. al 2017; Wolsko, Marino, & Keys, 2019). In that work, the

authors found firearm owners were more likely to report they would remove firearms as a suicide prevention strategy if presented with messages and information that were culturally aligned with their worldview. Similarly, the more culturally aligned messages were with firearm owners, the more likely they were to report feeling comfortable speaking with a provider about suicide.

This current research is a mirror investigation of those same issues; however, our approach was less focused on suicide, exploring more broadly experiences with firearms and firearm violence in general. Instead of working with firearm owners (though some of our focus group members did own firearms), we worked with physicians and other healthcare providers to gauge their experiences in talking about firearms with patients. We asked about their patient population, their experiences with conversations around firearm safety, the training they had had in order to carry out these conversations, and the issues and challenges they faced in counseling patients on firearm violence as a health issue. Our findings suggest the following:

1) That providers believe firearm ownership is prevalent among their patient populations;

2) That violence by firearms is something that they see, treat, and are concerned with;

3) That there are few data reports to understand their role or impact they might have if they intervene;

4) That conversations around firearm ownership as a public safety issue are challenging, and can create distrust between providers and patients; and

5) That there is no standard protocol for intervention, so healthcare providers are "making it up as they go along."

Methods

To complete this research, we held four focus groups between July 10, 2019 and December 16, 2019. Focus groups were led by Dr. Elizabeth Marino, Dr. Susan Keys, Dr. Brian Gibbs, and Dr. Elena Andresen. Project Manager Holly Yoo recruited focus group participants and provided logistical help. Two of the focus groups took place in Portland and two were in rural communities in Oregon. Focus groups lasted between 56 and 70 minutes. We provided a meal for participants, but they were otherwise not paid. The interview guide was semi-structured, meaning most of the questions were asked in the same order; however variation existed in phrasing and in interviewer responses to the focus group participants. Interviews were recorded, transcribed, and uploaded into MAXQDA. We iteratively coded transcripts to reveal a set of eleven primary codes. These codes were further broken down into categories when necessary. For confidentiality, excerpts reported here have identifying information de-identified noted by [brackets]. We present our findings below.

Provider Sample

Twenty-two providers attended one of four focus groups during Fall of 2019. This was a convenience sample: providers were recruited from a state physician/physician assistant association, OHSU provider groups and their community contacts, and in two rural areas, they were recruited by community contacts from OHSU Campus for Rural Health staff. Participants completed a brief survey about themselves and their practices. Table 1 presents participant

characteristics. In general, the majority of participants had been in practice for between 11 and 30 years, were white, and were equally divided by rural or urban practice locations. The majority of providers reported they worked in primary care/family medicine or internal medicine. Most practices were composed of primarily white patients (54.5%) or both white patients of color (36.4%).

Results

Our most critical finding is that these healthcare providers interact with patients for whom both the potential and actual effects of firearm violence are real. All participants had experience with some type of actual or potential firearm violence, and in some cases expressed fear that a patient would use a firearm and die by suicide. Most providers did not have training for how to engage with patients about firearm safety and the potential for harm. Most providers were not aware of empirical data that demonstrated best practices. Most rural providers assumed that the majority of their patient population had firearms and many believed that a significant percentage of those firearm owners did not have a firearm lock or keep the firearm in a safe, with the ammunition in a different location (Marino et al., 2017; Tejera & Andresen, 2019). Most providers had discussed the risks of firearms with some patients, but were doing so on an ad hoc basis, according to their own instinct and experience, and they were not using evidence-based protocols.

Patient population

In both urban and rural focus groups, healthcare providers indicated that they had diverse patient populations. Both types of groups identified rural firearm owners as a portion of their population base. Because trauma patients often end up in urban care settings, the rural firearm owning population was a concern for healthcare professionals in both Portland and in rural settings. In multiple interviews, providers contrasted the rural firearm owning population in Oregon to urban firearm violence they had experienced outside of the state.

In our rural focus groups, there was significantly more emphasis on the prevalence of firearms among the patient population. Multiple participants said things such as, “It's so normal… it’s more normal to think that people do have them than don't” or, “most people [have guns]. and ..they're not kept locked. They're really available in many places, you know. One person I know carries one under the seat of the car, loaded. ”Even for pediatricians or mental health specialists working primarily with high school aged students there were comments such as: “All of my teenagers have access to guns.” Some rural providers also told us that firearm safety did not mean the same thing to all of their patients. For some, it meant storing firearms in a firearm safe. For others, it meant having firearms on hand to deal with an intruder or other risk.

One of our participants said:

> “I mean my duck hunting gun is in my brother-in-law's locker and the ammunition is someplace else. It takes a significant time to put together everything when we're going to go duck hunting… But I think for a large

number of people, there's a nine-millimeter under their table or next to them, and it's open and there's no lock."

These comments indicated to us that rural healthcare providers were critically aware that firearms were ubiquitous among their rural patients. Rural health physicians were also more likely than providers working in urban areas to discuss patient mental health concerns as a constant part of their professional life – though we note this is probably not indicative of less mental health issues in urban areas. In one interview, a focus group participant made the claim, "A school shooting in [name]is inevitable." One participant noted when the question of mental health arose, that mental health needs of patients had "blown [him] away; how much mental health experience [he's] gained here."

One patient population that came up repeatedly, and was surprising to researchers, is the concern among providers for elderly patients who were also firearm owners. Providers told us that they had multiple elderly patients who maintained firearms and they were concerned about their safety. As one participant said, "the depressed elderly person who has some cognitive dysfunction makes me the most nervous." A particularly salient example of this was the observation by a hospice provider that many end-of-life patients had firearms and that firearm safety was a concern among hospice nurses, doctors, and social workers – both for their patients and for providers who provide support in firearm owners' homes.

Experiences of Firearms and Firearm Injury

Throughout our sample, healthcare providers had significant exposure to the outcomes of firearm violence. In many cases, participants reported their experiences with firearm death and injury in their personal lives. In most cases, however, participants were reporting their exposure to patients they worried might use a firearm to take their own life, or someone else's. Surgeons had treated firearm wounds. Providers had to decide whether to bring up owning a firearm with a patient who demonstrated suicidal tendencies. Multiple participants had experience with a client dying by suicide after they had seen them. All participants in our focus groups had experience with firearm violence among their patients.

Risk of Firearm Violence to Providers

One thing we did not expect from providers was the number of times they reported experiences with firearms in which violence erupted within their practice sites (not necessarily in Oregon). For example, one participant told the following story.

> "I've been directly impacted by the gun violence issues. I trained in a large urban area… My training was in what we described as a "knife and firearm club," where most of what my emergency and surgical training was all about, was knife and gun violence. I did an ER rotation in the emergency room. And, the week that I left that rotation and moved on, a physician sat in the seat that I was sitting in and was shot by a patient and killed."

Some providers discussed patients who shot themselves in the ER; others said that they instructed students in medical schools who were stalked during training and had to find alternate

teaching arrangements to provide safety to these students. Others indicated they had encountered patients with concealed firearms while in the exam room. These experiences suggested to us that healthcare facilities and academic health centers were not only places where violence is treated – but potentially places where firearm violence emerges. Research shows that healthcare workers are already four times as likely as other occupational groups to experience workplace violence (Bland et. al. 2015). Given the stories shared during these focus groups, it is important to know the percentage of healthcare providers who have been exposed to firearm violence, or the risk of firearm violence, in their workplace in Oregon.

Categories of Experience

There were a few categories of experience that were salient and distinct in the data set that may provide useful contrasts in health care provider experience, and which have potential for intervention. We note here that our sample was limited – each category of experience was reported on by as few as one or two respondents. However, it would be useful to create a matrix of categories of patient/provider interactions, and the following results could be the beginning of such a matrix.

Surgeons treating firearm wounds. Surgeons interact with patients who have experienced an episode of traumatic firearm injury. These experiences may include an accidental discharge, in which case a participant reported that patients were mostly embarrassed. It can also be an interaction with a victim of firearm violence, and/or a perpetrator. These acute scenarios may provide opportunity to prevent continued firearm violence, but are different from other preventative opportunities, which we highlight below.

Pediatrics Pediatric screenings include questions about firearms in the house. Because of that, these providers are more accustomed to having this conversation with patients than non-pediatric providers. The conversations can be either "awkward" as one provider put it, or successful, dependent on the provider and the patient. There were also reports on adolescent patients who were suicidal; and concerns about adolescents who have mental health issues and access to firearms. In all of these cases, healthcare providers typically discussed firearms and firearm violence with parents.

Suicidal ideation or Other Mental Health Conditions in Adults As one participant stated, "it's clear to me now that any conversations I've had about firearms has really been in conjunction with mental health." In many cases, physicians and other providers discussed their experiences with talking about firearms as a moment when a patient expresses suicidal ideation or other mental health issues and they worry the patient might cause harm to themselves or someone else. In these cases, primary care physicians, physician assistants, nurse practitioners, or nurses decide whether they will involve outside help. As one healthcare provider put it, "we usually involve psychiatry service and case managers and so then the firearm safety piece of it is really secondary or tertiary. So, we really usually never get to that part of the conversation." Other providers did "get to that part of the conversation" and directly talked with their patients about firearm safety. We note here particularly providers who were affiliated with the Department of Veterans Affairs (VA) healthcare system had more experience and referred to a

more systematic and trained approach to promoting firearm safety and suicide intervention with people they assumed had firearms.

Hospice and at Home Care. One area that may be overlooked in understanding what protocol exists, or investigating *if* protocol exists, is in how health care providers navigate firearm ownership in hospice settings. We found this is a unique setting for firearm conversations between providers and patients.

Challenges to Talking about Firearms and Firearm Safety

The following section examines the challenges that physicians face in how to intervene in situations where they perceive a patient is at risk of experiencing, or re-experiencing, firearm violence. Many of these challenges were described in the context of the different categories of experience described above.

Conversations shut down, are uncomfortable, and can lead to distrust. Many of our participants told us that the biggest challenge to talking with patients about firearms is that these conversations could be uncomfortable and/or can lead to animosity between patient and provider. Some felt that they had managed to learn and teach ways to engage patients about firearms.

A clear pattern in the data was that conversations about firearms could be volatile. Here is one example:

> Speaker: I don't find [the conversation about firearms] goes great.
> Researcher: Okay, so, tell me how it doesn't go great.
> Speaker: Anger, "You're not taking my gun away," "I'm not locking up my gun," … "You're trying to take my gun. You're just one of those people who doesn't have a gun," or, "You don't like guns."

Many participants categorized conversations about firearms with patients as anger provoking, or "hard" or "sensitive." Some providers were actively testing different messaging strategies in their practice. One participant said, "I felt like, um, every time I would ask the question, I would get a roadblock. So, we were looking at different ways to ask the question, now when I ask it, people actually say, "Oh, it's locked up or it's in a safe." The difficulty of the conversation leads to inaction in some cases. One participant said, "I also don't have much experience talking [about guns] with people, I mean, occasionally it would come up. In my experience, if I've mentioned it, there's a wall and … it just stops." In more extreme cases, providers reported that patients would lie or get angry; including accusing the healthcare provider of keeping "tabs" on the firearm owner.

> "Speaker: It ends up not being a great conversation because it's a lot of thinking that the government is out to get them and get their guns, then somehow enslave them.
> Researcher: This comes out when they are filling out the intake form.
> Speaker: Screening forms.

Speaker: The screening forms, I even thought about taking it out, because it's not useful.
Second Speaker: I agree, it shuts them down so much."

What is clear in this data is that these conversations can be socially disruptive for everyone involved. In many cases, the provider had very little training or tools to deal with promoting firearm safety. In the end, to have such a conversation also seemed frustrating for some providers because there was a lack of demonstrable evidence that interventions via conversation about firearms were making a significant impact on improving firearm safety.

"Researcher: How many times have you had that conversation with a patient? Like if you said, you should store bullets in a separate location.
Speaker: I don't know, 70, 80 times. You just do what you're told, as residents. I'm going to get yelled at if I say no, I didn't do that.
Researcher: How often does it go well?
Speaker: How often did it like sink in and people were like you were right thank you. Never."

Lack of Training. Providers are talking with patients about firearms, and because of the experience of trial and error, they are getting better at it. However, no one with whom we talked had had any formal training on how to talk with a patient about firearm safety. One participant, who is referencing providers in training, said the following:

"It ends up, as you were mentioning, being much more of a personal opinion kind of a discussion on occasions. So, we always bring it up, we always are nervous about bringing it up, we always, evaluate everything … multiple times, everything. and the students are always very appreciative of it being brought up. I don't feel like we've ever resolved anything."

Another said,

"Just like all of our other cultural competencies, I think gun ownership is a cultural competency that isn't taught in the same way and I'm not sure why not. But I think it could be like we have a perfect model in medical education of teaching cultural competencies and I think this could be one."

From our research perspective, it was challenging to understand how physicians and other providers were learning to speak to patients about firearms – but it was clear that some were clearly adapting to what they saw as a public health crisis within their patient population. What seemed to be consistent, even among providers who told us they often talked with their patients about firearms, was that they were inventing intervention language, loosely linked to data about firearm risk.

The Culture Gap. This research also demonstrated that some providers felt a distinct culture gap surrounding rural firearm owners that exacerbated an already challenging conversation. One participant said the following:

> "I think from a personal training standpoint, sometimes that it'd be really helpful to me being a somewhat new Oregonian to have a hunter come and just talk to me about their guns, … like what they mean to them, what they do with them, what is the hunting season? Like, just how it all works, I don't get it. [laughter] … I really don't get it. So, it makes it hard for me to have that conversation."

When physicians lack the cultural competency to talk to rural firearm owners in Oregon, then the lack of training becomes more pronounced. For example, one participant said, "As far as being in a rural environment versus urban environment, to talk to somebody about guns, I don't really know how to do it because I've never really gotten any training."

Lack of data. Multiple providers said that the lack of data and lack of clear protocols to follow made them hesitant to have a conversation with their patients about firearms. One participant said:

> "The motivation to have the hard conversations I think are comparable on quitting smoking or quitting drug use. Those can be unpleasant conversations, but I know there's data backing me up that every time you approach, every time you bring it up in the right way, you increase your chances of stopping. So, there's a reason that I'm gonna have that hard conversation. I don't mind if they get mad or angry at me. I don't have that data for guns, or I'm not aware of any. So, I feel like I'm getting into this unpleasant conversation, this person's gonna get angry at me, and I can't back myself up and say that it's really doing them any good, ... There's 18 other discussions I could have where I have some data that might affect them, you know?"

Another participant expressed the thought that before the data, any conversation is just judgement. They said, "like, everything else in medicine, that's a public health issue. We then have the data that explains why we're doing what we're doing and it's no longer judgement, it's no longer me telling you this. It's, "the data shows this." you can have a reasonable conversation about how to proceed."

Lack of Next Steps. Other providers pointed out that there was often no protocol on what to do if a patient said they did NOT store their firearm in a safe place, or did NOT intend to remove it in case of suicidal ideation. One participant said, "If I don't have a way to then act on that information, then why am I asking the question in the first place?" Another said, "What do you do with that information. … If as soon as the gun question comes up, then you just go home and lie in bed and know that Jim lives down the street, with terrible depression, terrible anxiety, and he's got guns, you can't do anything about it. So, it's like, if you can't treat why test?"

Another provider said: "I think in the outpatient setting, having the actionable item, like if we just focused on gun storage, knowing what that next step would be. … If you screen like you don't have food or you don't have transportation, we have an actionable next step of what to do.

There's not a uniform next step." From an intervention standpoint, the lack of "next steps" or protocol for what happens once a health care provider flags an issue is likely a significant barrier to intervention.

Difficult decisions – firearms and the right to die. Some providers talked about times when their role was unclear for a patient who was experiencing suicidal ideation, had attempted suicide, or had a debilitating disease. In one case, a physician told us that a patient had shot themselves in the emergency room. As the physician said, "my residents were on the code team and went to code him, and were incredibly conflicted about what it meant to code someone who had tried to kill themself in the hospital."

Lack of Time. Researchers expected that a lack of time would be cited as a reason it was challenging to have conversations about firearms – and it was. Some providers questioned the ability of a provider to handle all safety issues or risks with which a patient might come into contact. They said, "The one concern I have is, are we expanding the well visit to the point where it's going to take us an hour to do every well visit? But I have the thought as we're becoming more and more aware of earthquakes, if we added a safety question, you know, "Do you have extra water in your home because of the possibility of an earthquake? By the way, do you have guns?"

One participant said, "I mean, in my current practice I would say honestly out of the things I have, … it doesn't rise to top priority." To put the demands on a primary care physician and pediatric primary care physician into perspective, one provider told us:

> "Speaker: I don't know how many questions are mandatory for us to ask now and intervene on. …
> Researcher: Yeah.
> Speaker:-- and … maybe they don't have enough food.
> Researcher: Okay.
> Speaker: So, you're like having to deal with a lot.
> Researcher: Yeah.
> Speaker: So, adding another thing is a lot."

Others disagreed that the timing was insufficient to have a conversation about firearms, suggesting that they have to work so many things into their workflows and that given the relevancy of this topic, they should find a way to do it.

Diversity of Healthcare Providers. More than one provider pointed out that opinions on firearms among providers were not uniform. The political and cultural nature of firearms, paired with the lack of data on successful intervention, created a unique condition where – while all of our participants expressed concern for their patients and concern for firearm violence – there was disagreement about the best way to confront firearm violence and best practice for providers.

Our participants also disagreed on the role a provider should play in the issue. Some participants felt that firearm violence was best engaged at a community or policy level, others were committed to interventions in healthcare settings. Some providers saw firearm violence as a

monumental challenge to public health, while others thought that their patients were confronting much larger health challenges, and that removing firearms from their home or keeping firearms in a safe was not as significant of an issue.

Those who are intervening. Hospice care and the VA are the areas in which there seemed to be significantly more guidance on how to discuss firearms with patients. While the vast majority of those interviewed had had no formal training, and knew of no training regarding interventions around firearm safety, one outlying participant said:

> "It's become a routine part of every encounter I have with someone who's depressed, primarily if they're really suicidal. And then we also teach our residents how to have these conversations and ask them at staffing encounters, 'You know, it sounds like your patient is really depressed. Did you talk about suicide?' And of course, 'Did you ask about guns and how they're stored?'
>
> So, we do make that a part of the didactic curriculum with the VA clinic residents, …. and then we do it as a didactic session with them. So, we do it in every staffing encounter and then it's a didactic session."

Firearms as Trust Building. Interestingly, there was one category of experience that came up in every focus group, that demonstrated the positive outcomes of firearms as a cultural object. For providers who owned a firearm, or had experience with firearms, talking to patients about their firearms was a) easier; and b) was a trust building exercise. This was so significant that even if providers were not talking about firearm safety, or intervening with a patient that they worried may be exposed to firearm violence, bringing up and discussing firearms was a way to build trust between provider and patient. As researchers who have worked on the cultural nature of firearms in the past, we recognize these "winks" as a potent symbol of non-judgement, class, and in-group solidarity.

One provider said:

> "If it is somebody that uses guns as a recreation or sport, I will engage as best I can in that conversation with them trying to find a common ground - just to have a conversation about anything, about them as a person. … So I will engage about, you know, what shooting range do you go to? What do you hunt, what types of guns do you use? But it's more, it's not in a firearm safety way. [It's] trust building, rapport building."

The interesting thing about the cultural nature of firearms is that the very sensitive nature of the topic both makes intervention conversations difficult, *and also* creates the potential to bond providers with their firearm-owning patient population.

Focus Group Summary

There is much to be learned about firearm violence writ large, and much to understand about how the healthcare community, specifically, is responding to firearm-related violence. It was particularly noteworthy to us that, in Oregon, rural/urban divide issues loom large in understanding the nature of firearms in people's lives. These cultural issues come to the fore when providers and patients discuss firearms and there is potential to alienate firearm-owning patients if this conversation goes poorly. This project helps to layout categories of experience physicians and other healthcare providers have in relation to firearm safety interventions; and lays out challenges present in those experiences. Future research could be directed at understanding and testing strategies to mitigate those challenges.

Table 1: Characteristics of 22 Providers and their Practices	
Provider Participant Characteristics	
	Percentage
Age group	
25-35	9.1%
36-50	45.4%
51-65	22.7%
66 or older	22.7%
Years in practice	
1-10	18.2%
11-20	31.8%
21-30	27.3%
31-40	9.1%
41 or more	13.6%
Practice type	
Urban/suburban	50.0%
Rural	50.0%
Specialty	
MD/DO Primary care/Family medicine	27.3%
MD/DO Internal Medicine	31.8%
MD/DO Other specialty	40.9%
Nurse Practitioner, Physician Assistant	27.3%
Provider race/ethnicity	
White	81.8%
People of color	4.5%
Multiple	4.5%
Not answered	9.1%
Political affiliation	
Democrat	59.1%
Republican	9.1%
Independent or other	31.8%
Practice Characteristics	
Patient race/ethnicity	
Primarily white	54.5%
Primarily people of color	0.0%
Both	36.4%
Not answered	9.1%
Patient Socioeconomic characteristics	
Primarily live above the poverty line	9.1%
Primarily live below the poverty line	22.7%
Mixed patient population	45.4%
Not answered	18.2%
Patient age groups	
Primarily children	31.8%
Primarily adults	45.4%
Mix of children and adults	22.7%
Primarily people under 65	9.1%
Primarily people over 65	18.2%
Mix of people under and over 65	50.0%
Patient languages	
English as first language	45.4%
English as second language	0.0%
Mixture of languages	45.4%
Not answered	9.1%

Recommendations and Next Steps

Firearm-related injuries and mortality have reached new and alarming frequency since the COVID pandemic. Even before these months of extraordinary social and economic stress, Oregon experienced an average of 456 deaths each year due to firearm-related injuries. This report raised the question of firearm safety, with special relevance to firearm availability in the context of children and suicide. Oregon has few available data from our residents, and nationally there has been only modest attention to surveys that helped quantify risk and firearm availability. There also have been few research studies about the potential for healthcare providers to add firearm safety as another health promotion and injury prevention topic between providers and their patients and patients' families.

The current report summarized household firearm risk based on CDC surveys on unlocked and loaded firearm prevalence, for which Oregon may have a somewhat higher risk than the US overall (the latest data from 2017 show Oregonian household are at less risk). In addition, similar to national surveys, about 6% of Oregon high school students reported feeling unsafe and missing class, and the same percent said they had been threatened or injured with a weapon. Oregon students have not provided information on firearm carrying, but as high as 5.5% of U.S. high school students report carrying a gun. These data are worrisome, we do not have some more detailed and potentially useful information from schools and our adult residents.

We worked with the OMA, community and academic healthcare providers, and experienced academic researchers to collect original data based on Oregon experience and context. Based on our state-wide provider survey, and a series of qualitative focus groups, we conclude our healthcare providers have had very little formal training to engage their patients in discussing firearm safety. Most think that patient prevention activities should include these topics, but they need training and resources (e.g., community programs, clinical information systems) in order to achieve beneficial engagement and counseling as providers.

Based on the background literature and the key findings from all of these sources, we make the following recommendations.

1) Identify and engage a public health (Oregon Health Authority [OHA]) practice "champion" for firearm safety to implement population surveillance, comprehensive programing for firearm safety storage and equipment, and best practice educational and counseling strategies in healthcare settings.

2) Develop and disseminate free Oregon-centric firearm safety counseling training programs for healthcare providers.

3) Develop and disseminate tailored local media campaigns with community partners to address knowledge gaps and create communities informed about and committed to firearm safety.

4) Develop and disseminate a toolbox of practice-based protocols and other healthcare setting specific tools that will help to overcome logistical barriers to firearm counseling and provide access to low-cost firearm safety training and firearm security equipment.

5) Monitor program outcomes and healthcare provider knowledge and emerging education needs in Oregon with combined surveys and qualitative methodologies.

6) Initiate biannual survey modules, including all questions developed and validated by the CDC, that monitor firearm safety based on the existing Centers for Disease Control and Prevention (CDC) Oregon Healthy Teens (OHT), and Behavioral Risk Factor Surveillance System (BRFSS) Surveys.

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Appendix I.

Weapon Carrying among High School Students: data from the Youth Risk Behavioral Surveillance System

César Higgins Tejera, M.P.H, MS and Elena Marie Andresen, Ph.D.

Introduction/Background

School violence and injury receive national attention. Diverse studies have found an association between poor mental health outcomes and the prior experiences of violence and being abused [1]. In addition, a cross-sectional study conducted by Pickett et al., (2005) identified weapon carrying as a common indicator of physical violence in youth [2]. In an analysis of trends of weapon carrying, the authors found that there was a statistically significant increase in the prevalence of weapon carrying between the years 1998 – 2010; this increment was, in particular, significant among White students in comparison to Black or Hispanic students [3]. These and other national issues have led to a public health priority in preventing morbidity and mortality related to high school violence. Between 1991 through 2017, the Youth Risk Behavior Survey (YRBS) monitored weapon carrying among high school students. In this report, we calculated estimates from years 2007 to 2017 to characterize the prevalence of weapon carrying and students' perceptions of school safety, whenever possible (e.g., years of available data). We also sought to compare Oregon and U.S. prevalence of weapon carrying.

To our knowledge, there is no current published data related to weapon carrying among Oregon high school students. Such information is essential for public health programs seeking to reduce school violence, bullying, and abuse. We hope that this initial report opens a dialogue about the need for documenting whether young Oregonians carry weapons to the school environment, and whether they have been threatened or injured.

Overview of the YRBS

The Youth Risk Behavior Survey (YRBS) was developed by the Centers for Disease Control and Prevention (The CDC https://www.cdc.gov/healthyyouth/) in 1990, with the objective of monitoring a wide variety of health behaviors among youth that may lead to death, impairment, or social problems. The survey is administered biannually to high school students in 9th and 12th grade. Among the main topics of the survey are behaviors that contribute to unintentional injuries, which includes questions related to weapon carrying, in school fighting, being threatened with a weapon, and gun carrying. The survey is administered via paper-pencil to a nationally representative sample of high-school students attending public and private schools. The questionnaire has been tested for reliability on two occasions, and the survey has a substantial retest reliability (kappa = 0.61 – 1.0 gauged as substantial to exceptionally high depending on the question). The national YRBS uses a three-stage, cluster sample design to obtain a nationally representative sample of U.S. students in grades 9–12. The national YRBS sample is designed to produce estimates that are accurate within ±5% at a 95% confidence level. Overall estimates and estimates of subgroups (gender, grade, race/ethnicity, grade by gender, and race/ethnicity by gender) subgroups meet this statistical standard. Estimates for grade by race/ethnicity subgroups are accurate within ±5% at a 90% confidence level. For all levels of sampling (e.g., national, state, territorial, tribal, and large urban school districts) sampled schools, classes, and students who refuse to participate are not replaced. Sampling without replacement maintains the integrity of the sample design and helps avoid the introduction of unmeasurable bias into the sample [4]. In Oregon, we have a state version of

the YRBS, the Oregon Healthy Teens Survey, which is a survey performed among 8th and 11th grade youth (OHT https://www.oregon.gov/oha/ph/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/index.aspx). The survey is conducted in odd numbered years. The OHT Survey is an anonymous and voluntary survey sponsored by the Oregon Health Authority (OHA) in collaboration with the Oregon Department of Education. The survey is offered in two platforms: by paper or online. The OHT uses most questions based on the YRBS, although there are some differences.

At the national level, questions related to weapon carrying, school violence, and perception of safeness in school have been included periodically in the national questionnaire (biannually for the past decade). However, because states are able to decide on the questions in their respective surveys, there is less consistency in Oregon, across all the years of analysis. In this report we only present data available for Oregon during the years 2015 and 2017. The YRBS has consecutively included five questions related to weapon carrying, perception of being safe in school, and having been threatened in school grounds with a weapon. Questions are listed below.

1. *During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?*
   0 days
   1 day
   2 or 3 days
   4 or 5 days
   6 or more days
2. *During the past 30 days, on how many days did you carry a gun? (Do not count the days when you carried a gun only for hunting or for a sport, such as target shooting.)*
   0 days
   1 day
   2 or 3 days
   4 or 5 days
   6 or more days
3. *During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?*
   0 days
   1 day
   2 or 3 days
   4 or 5 days
   6 or more days
4. *During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?*
   0 days
   1 day
   2 or 3 days
   4 or 5 days
   6 or more days
5. *During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?*
   0 times
   1 time
   2 or 3 times
   4 or 5 times
   6 or 7 times
   8 or 9 times
   10 or 11 times
   12 or more times

We used Stata 15 for all analyses to account for the complex sampling design of the YRBS and the OHT. Data from the U.S. and Oregon are currently available only for 2015 and 2017. Therefore, except for Table 1 that compares Oregon to the U.S., the rest of tables (Tables 2-6) only contain information about the U.S. YRBS. We estimated the prevalence of weapon carrying, gun carrying, weapon carrying in school property, missing class because of feeling unsafe in school grounds, and having been threatened or injured with a weapon in school. We calculated 95% confidence intervals (CI) for each prevalence estimate.

Results

In 2015, the prevalence of missing class because feeling unsafe in school grounds was approximately similar in both Oregon and the U.S. (6.0% vs 5.6% respectively). In addition, around 6% of high school students in the U.S. and Oregon reported to have been threatened/injured with a weapon in school during the year previous to the survey (see Table 1). The prevalence of weapon carrying in school grounds in the U.S. was estimated to be 4.1%, and there are no current estimates of this prevalence for Oregon. Overall, Tables 2-6 show the prevalence of each one of the questions mentioned in the description above. The percentages provided have been weighted and are representative of the U.S. Additionally, Table 7 illustrates the 2017 Healthy Teens Survey update that about 5.2% of students in 8th grade and 3.3% of students in 11th grade did not go to school for one day because they felt they would be unsafe at school or on the way to school. The survey results also indicated that 4.4% of students in 8th grade and 2.6% of students in 11th grade had been threatened or injured with a weapon on school property 1 time. The results from both question 1 and question 2 in Table 7 indicated that a higher percentage of students in 8th grade reported having felt unsafe or having been threatened or injured while at school than students in 11th grade. This draws attention to the possible concern that students attending middle school may tend to feel or be more unsafe regarding violence on school property than students attending high school in the state of Oregon.

Table 1. Comparison of Oregon and National Data on Weapon Carrying. Youth Behavioral Risk Factor 2015

			U.S. (respondent n=14,423)	
			%	[95%CI]+
6. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?*				
0 days			83.8	[81.9, 85.6]
3 or less days			7.1	[6.2, 8.1]
4 or more days			9.1	[8.0, 10.4]
7. During the past 30 days, on how many days did you carry a gun?*				
0 days			94.7	[93.9, 95.4]
3 or less days			3.1	[2.6, 3.6]
4 or more days			2.2	[1.8, 2.7]
8. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?*				
0 days			95.9	[95.3, 96.5]
3 or less days			1.9	[1.6, 2.3]
4 or more days			2.2	[1.8, 2.7]
	Oregon (respondent n=28,740)		**U.S. (respondent n=14,423)**	
	%	**95%CI**	**%**	**[95%CI]**
9. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?				
0 days	94.0	[93.5, 94.4]	94.4	[93.5, 95.2]
3 or less days	5.0	[4.6, 5.3]	4.4	[3.7, 5.2]
4 or more days	1.0	[0.95, 1.4]	1.2	[1.0, 1.5]
10. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?				
0 time	94.1	[93.7, 94.5]	94.0	[93.2, 94.8]
3 or times	4.7	[4.4, 5.0]	4.2	[3.6, 4.9]
4 or more times	1.3	[1.1, 1.5]	1.8	[1.4, 2.3]

*Not asked in Oregon for 2015 and 2017 +CI= confidence interval

Table 2. National Data on Weapon Carrying among Youth. Youth Behavioral Risk Factor 2013

	U.S. (respondent n=13,252)	
	%	[95%CI]+
1. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?		
0 days	82.1	[80.6, 83.5]
3 or less days	7.4	[6.9, 8.0]
4 or more days	10.5	[9.2, 12.0]
2. During the past 30 days, on how many days did you carry a gun?		
0 days	94.5	[93.7, 95.2]
3 or less days	3.3	[2.8, 3.8]
4 or more days	2.2	[1.9, 2.7]
3. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?		
0 days	94.7	[95.3, 96.5]
3 or less days	2.3	[1.6, 2.3]
4 or more days	3.0	[1.8, 2.7]
4. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?		
0 days	93.0	[91.7, 94.0]
3 or less days	5.6	[4.7, 6.7]
4 or more days	1.4	[1.1, 1.8]
5. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?		
0 time	93.0	[92.3, 93.8]
3 or less times	4.7	[4.1, 5.3]
4 or more times	2.3	[1.9, 2.7]

+CI = Confidence Interval

Table 3. National Data on Weapon Carrying among Youth. Youth Behavioral Risk Factor 2011

	U.S. (respondent n=15,024)	
	%	[95%CI] +
1. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?		
0 days	83.4	[82.0, 84.6]
3 or less days	7.5	[6.9, 8.1]
4 or more days	9.2	[8.2, 10.2]
2. During the past 30 days, on how many days did you carry a gun?		
0 days	94.9	[94.3, 95.4]
3 or less days	3.0	[2.6, 3.4]
4 or more days	2.1	[1.8, 2.6]
3. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?		
0 days	94.6	[93.9, 95.3]
3 or less days	2.6	[2.3, 3.0]
4 or more days	2.8	[2.3, 3.3]
4. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?		
0 days	94.1	[93.1, 94.9]
3 or less days	4.2	[3.5, 5.1]
4 or more days	1.7	[1.4, 2.1]
5. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?		
0 time	92.6	[91.9, 93.2]
3 or less times	5.0	[4.5, 5.5]
4 or more times	2.4	[2.1, 2.8]

+ Confidence Interval

Table 4. National Data on Weapon Carrying among Youth. Youth Behavioral Risk Factor 2009

	U.S. (respondent n=16,110)	
	%	[95%CI]+
1. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?		
0 days	82.5	[80.9, 83.9]
3 or less days	7.8	[7.2, 8.3]
4 or more days	9.7	[8.6, 10.9]
2. During the past 30 days, on how many days did you carry a gun?		
0 days	94.1	[93.1, 94.8]
3 or less days	3.5	[2.9, 4.2]
4 or more days	2.4	[1.9, 2.9]
3. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?		
0 days	94.4	[93.7, 95.0]
3 or less days	2.8	[2.5, 3.2]
4 or more days	2.8	[2.3, 3.3]
4. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?		
0 days	95.0	[94.3, 95.7]
3 or less days	3.6	[3.1, 4.2]
4 or more days	1.4	[1.1, 1.7]
5. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?		
0 time	92.3	[91.6, 93.1]
3 or less times	5.1	[4.6, 5.7]
4 or more times	2.6	[2.2, 3.0]

+ Confidence Interval

Table 5. National Data on Weapon Carrying among Youth. Youth Behavioral Risk Factor 2007

	U.S. (respondent n=13,615)	
	%	[95%CI]+
1. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?		
0 days	82.0	[80.2, 83.7]
3 or less days	8.3	[7.6, 9.0]
4 or more days	9.7	[8.5, 11.1]
2. During the past 30 days, on how many days did you carry a gun?		
0 days	94.8	[94.0, 95.6]
3 or less days	3.3	[2.7, 3.9]
4 or more days	1.9	[1.6, 2.2]
3. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?		
0 days	94.1	[93.7, 95.0]
3 or less days	2.5	[2.2, 2.9]
4 or more days	3.4	[2.7, 4.0]
4. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?		
0 days	94.5	[93.7, 95.3]
3 or less days	4.2	[3.6, 5.0]
4 or more days	1.3	[1.0, 1.5]
5. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?		
0 time	92.2	[91.2, 93.0]
3 or less times	5.4	[4.9, 6.1]
4 or more times	2.4	[1.9, 2.9]

+ Confidence Interval

Table 6. National Data on Weapon Carrying among Youth. Youth Behavioral Risk Factor 2005

	U.S. (respondent n=13,646)	
	%	[95%CI]+
1. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?		
0 days	81.5	[79.8, 83.1]
3 or less days	7.9	[7.2, 8.6]
4 or more days	10.6	[9.3, 12.1]
2. During the past 30 days, on how many days did you carry a gun?		
0 days	94.6	[93.6, 95.4]
3 or less days	3.4	[2.8, 4.2]
4 or more days	2.0	[1.7, 2.3]
3. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?		
0 days	93.5	[92.5, 94.4]
3 or less days	3.4	[2.9, 3.9]
4 or more days	3.1	[2.5, 3.8]
4. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?		
0 days	94.0	[92.6, 95.1]
3 or less days	4.9	[3.8, 6.3]
4 or more days	1.1	[0.9, 1.3]
5. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?		
0 time	92.1	[91.3, 92.8]
3 or less times	6.0	[5.3, 6.7]
4 or more times	1.9	[1.7, 2.3]

+ Confidence Interval

Table 7. State Data on Personal Safety among Youth. Oregon Healthy Teens Survey 2017.

3. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?

	Grade 8	**Grade 11**
	State %	*State %*
0 days	90.9	93.4
1 day	5.2	3.3
2 or 3 days	2.4	2.2
4 or 5 days	0.6	0.5
6 or more days	0.9	0.6

**Percentages exclude missing answers*

4. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?

	Grade 8	**Grade 11**
	State %	*State %*
0 times	91.6	94.8
1 time	4.4	2.6
2 or 3 times	2.2	1.4
4 or 5 times	0.6	0.3
6 or 7 times	0.3	0.1
8 or 9 times	0.2	0.2
10 or 11 times	0.1	0.1
12 or more times	0.6	0.4

**Percentages exclude missing answers*

Appendix II.

Local and National Prevalence of Household Firearms Ownership and Firearm-Storage Information from the Behavioral Risk Factor Surveillance System

César Higgins Tejera, M.P.H., MS. and Elena Marie Andresen, Ph.D.

Introduction / Background

Firearms injuries are one of the leading causes of death in the U.S.[1]. According to previous research, more than 50% of firearms injuries are related to suicide and injuries related to homicides account for nearly 40% of all firearm deaths; a remaining small proportion of firearm related-deaths are due to unintentional injuries [2]. A population study during the years 1981 – 2002 found that higher rates of firearm ownership are associated with higher rates of overall suicide [3]. Therefore, firearm-related morbidity and mortality are important pressing issues in public health. During the past decades, the Behavioral Risk Factor Surveillance System (BRFSS) has monitored information regarding household firearm prevalence and firearm storage practices. In this report, we compare the prevalence of household firearm ownership and storage practices between Oregon and the U.S. for the years with available data. The OHSU IRB reviewed this project and classified it as exempt (non-human research/survey data).

As described in the OHSU project report "Gun Violence as a Public Health Issue [2018]", Oregon experiences an average of 456 deaths each year due to gun-related injuries. The majority of these deaths are due to suicide. Underlying these deaths is the question of availability of firearms in Oregon, and the potential safety risks of these firearms [4].

Overview of the BRFSS

In the U.S states and its territories, survey data help define the health and health behaviors, and health risks of the population. The BRFSS is an annual telephone survey that asks about health, behaviors that affect health, and access to health care that is supported by the Centers for Disease Control & Prevention [the CDC. Documentation at https://www.cdc.gov/brfss]. The survey is random, meaning that any resident has the same probability to be called. However, some groups of people are not included. For example, children under the age of 18 and people who reside in an institution, such as a jail or nursing home, are not included in the survey. People who do not have a telephone or who do not speak English or Spanish are also not included. Although overall, approximately 95 percent of U.S. households have telephones, coverage ranges from 87 to 98 percent across states and varies for subgroups as well. For example, people living in the South, minorities, and those in lower socioeconomic groups typically have lower telephone coverage. No direct method of compensating for non-telephone coverage is employed by the BRFSS; however, a method known as post-stratification weighting is used, which partially corrects for bias caused by non-telephone coverage. These weights adjust for differences in probability of selection and nonresponse, as well as non-coverage. The statistical weights are always applied in analyses to produce representative population-based statistics.

At the national level, questions about firearms have been included periodically in the U.S. as a whole, and in Oregon. In this report, we provide the result of the BRFSS firearms questions for Oregon, and also for the entire U.S. for the years 2001, 2002, and 2004. There were a total of three questions during the years 2002 and 2004 and two additional CDC computed variables were available in 2002. The

year 2001 only included one question related to firearm ownership prevalence [question 1, below]. We list the questions below:

1. *Are any firearms kept in or around your home?*
   Yes *Don't know/Not Sure*
   No *Refused*
2. *Are any of these firearms now loaded?*
   Yes *Don't Know/Not Sure*
   No *Refused*
3. *Are any of these loaded firearms also unlocked? [By "unlocked" we mean you do not need a key or a combination to get the gun or to fire it. We don't count safety as a lock]*
   Yes *Don't Know/Not Sure*
   No *Refused*

In 2002, the CDC included two calculated variables from the previous questions. The variable *living in a home with loaded firearm* was derived from the first and second questions as follows:

4. *Risk factor for living in home with loaded firearm*
   Not at Risk (Living in home with no guns or unloaded firearm)
   At Risk (Living in home with loaded firearm)

The variable *living in home with loaded and unlocked firearm* was derived from all three previous questions as follows:

5. *Risk factor for living in home with loaded & unlocked firearm*
   Not at Risk (Living in home with no guns or unloaded firearm or locked firearm)
   At Risk (Living in home with loaded and unlocked firearm)

We used Stata 15 for all analyses to account for the complex sampling design of the BRFSS and to calculate 95% confidence intervals (CI) for prevalence percentages. Data from all states were averaged to produce the nationally representative sample statistics. We compared the U.S. and Oregon estimates using a chi-squared statistics test. We compared national and local prevalence of adults with household firearms, loaded firearms, and unlocked firearms.

Results

In 2001, the national prevalence of household firearm ownership was estimated to be 31.7% (95% CI: 31.4 – 32.1%) in comparison to 39.8% in Oregon (95% CI: 37.7 – 42.2%), which means that the prevalence of firearms in Oregon was 1.3 times larger than the national prevalence. This finding was highly statistically significant ($p<0.00001$) (Table 1).

Table 1. Comparison of Oregon and National Data on Firearms. Behavioral Risk Factor Surveillance System 2001

	Oregon (respondent n=2,433)		**U.S.** (respondent n=201,881)	
Variable	%[3]	[95%CI][4]	%[3]	[95% CI][4]
2. Are any firearms kept in or around your home?[1]				
Yes	39.8	[37.7, 42.0]	31.7	[31.4, 32.1]
No	59.7	[58.0, 62.3]	68.3	[67.9, 68.6]
		$p^2= 0.0001$		

[1]This question was asked of all survey respondents.
[2] p-values were calculated using a chi-square test comparing Oregon percentages to the U.S.
[3] Weighted column percentages [4] 95% Confidence Intervals.

When stratifying by gender, Oregon men were 26% more likely to keep a firearm around the house in comparison to U.S. men. Similarly, the prevalence of firearm was higher among men than women for both Oregon and the U.S. For example, 48.4% of men in Oregon reported to have a firearm around the house while only 32.0% of women did so (Table 1A). Additionally, the prevalence of household gun ownership was almost double among White Oregonians in relation to other

racial and ethnic groups (e.g., Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders): during 2001, 42.9% of White Oregonians reported having a firearm at home in comparison to only 23.8% of other racial/ethnic groups (Table 1A). Our analysis also showed that the highest prevalence of gun ownership was between ages 35-54 in both Oregon and the U.S. (Table 1B)

Table 1A. Comparison of Oregon and National Data on Firearms. Stratification by Gender and Race/Ethnicity. Behavioral Risk Factor Surveillance System 2001

Variable	Oregon				U.S.			
	Women		Men		Women		Men	
	%[2]	[95%CI][3]	%[2]	]95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Are any firearms kept in or around your home?[1]								
Yes	32.0	[29.3,34.7]	48.4	[45.0,51.7]	26.0	[25.57,26.36]	38.2	[37.61,38.72]
No	68.0	[65.3,70.7]	51.6	[48.3,55.0]	74.0	[73.64,74.43]	61.8	[61.28,62.39]

	Oregon				U.S.			
	White		Other Groups[4]		White		Other Groups[4]	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Are any firearms kept in or around your home?[1]								
Yes	42.9	[40.54,45.26]	23.8	[19.38,28.93]	38.1	[37.67,38.44]	16.5	[15.95,17.1]
No	57.1	[54.74,59.46]	76.2	[71.07,80.62]	61.9	[61.56,62.33]	83.5	[82.9,84.05]

[1]This question was asked of all survey respondents.
[2] Weighted column percentages [3] 95% Confidence Intervals.
[4] Other race and ethnic groups include Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders.

Table 1B. Comparison of Oregon and National Data on Firearms. Stratification by Age Group Category. Behavioral Risk Factor Surveillance System 2001

Variable	Oregon				U.S.			
	Yes		No		Yes		No	
	%[2]	[95%]CI[3]	%[2]	[95%]CI[3]	%[2]	[95%]CI[3]	%[2]	[95%]CI[3]
Are any firearms kept in or around your home?[1]								
Age								
18-24	8.1	[6.2,10.7]	14.9	[12.9,17.3]	10.0	[9.5,10.4]	14.3	[13.9,14.7]
25-34	14.5	[12.3,17.0]	19.4	[17.3,21.6]	16.0	[15.5,16.4]	19.8	[19.4,20.2]
35-44	20.3	[17.6,23.3]	21.4	[19.1,23.9]	21.2	[20.7,21.7]	20.6	[20.2,20.9]
45-54	21.9	[19.2,24.9]	18.2	[16.1,20.4]	20.9	[20.4,21.4]	17.4	[17.1,17.8]
55-64	15.9	[13.5,18.5]	9.7	[8.2,11.4]	14.9	[14.5,15.4]	10.6	[10.4,10.9]
65+	19.3	[16.7,22.2]	16.4	[14.5,18.4]	17.0	[16.6,17.5]	17.3	[17.0,17.7]

[1]This question was asked of all survey respondents.
[2] Weighted percentage, subjects among each age group who answered to the question.
[3] 95% Confidence Intervals.

During year 2002, the national prevalence of household firearm ownership was estimated to be 34.4% (95% CI: 34.1 – 34.7%) in comparison to 40.3% in Oregon (95% CI: 38.2 – 42.3%), which means that the prevalence of firearms in Oregon was almost 1.2 times the national prevalence ($p<0.00001$) [Table 2]). The proportion of respondents that answered yes to whether the firearms were loaded was 22.7% (95% CI: 22.2 – 23.1%) for the national sample compared to 25.9% (95% CI: 22.2 – 23.1%) in Oregon. Furthermore, 60.3% (95% CI: 22.2 – 23.1%) of respondents in the national sample affirmed that the loaded firearms were unlocked in comparison to 68.8% (95% CI: 62.7 – 74.4%) of Oregon respondents. These findings were highly statistically significant (Table 2). The analysis of the two calculated variables demonstrated that Oregonians were more likely to be at risk for living in a home with loaded firearms: slightly more than ten percent (10.3%. 95% CI: 9.1 – 11.6%) compared to the national average of 7.6% (95% CI: 7.5 – 7.8%). In addition, living in a home with loaded and unlocked firearms was higher in Oregon (7.1 %. 95% CI: 6.1 – 8.2%) versus 4.5% nationally (95% CI: 4.4 – 4.7%) (Table 2).

Table 2. Comparison of Oregon and National Data on Firearms. Behavioral Risk Factor Surveillance System 2002

Variable	Oregon (respondent n=2,897) %[6]	Oregon [95%CI][7]	U.S. (respondent n=231,291) %[6]	U.S. [95% CI][7]
1. Are any firearms kept in or around your home?[1]				
Yes	40.3	[38.2, 42.3]	34.4	[34.1, 34.7]
No	59.7	[57.7, 61.8]	65.6	[65.3, 65.9]
		p^5= 0.0001		
3. Are any of these firearms now loaded?[2]				
Yes	25.9	[23.1, 28.8]	22.7	[22.2, 23.1]
No	74.7	[71.2, 76.9]	77.3	[76.9, 77.8]
		p^5= 0.019		
4. Are any of these loaded also unlocked?[3]				
Yes	68.8	[62.7, 74.4]	60.3	[59.1, 61.4]
No	31.2	[25.6, 37.3]	39.7	[38.6, 40.9]
		p^5= 0.007		
5. Living in home with loaded firearm.[4]				
Not at risk	89.7	[88.4, 90.9]	92.4	[92.2, 92.5]
At Risk	10.3	[9.1, 11.6]	7.6	[7.5, 7.8]
		p^5= 0.0001		
6. Living in home with loaded and unlocked firearm.[4]				
Not at Risk	92.9	[91.8, 93.9]	95.5	[95.3, 95.6]
At Risk	7.1	[6.1, 8.2]	4.5	[4.4, 4.7]
		p^5= 0.0001		

[1]This question was asked of all survey respondents.
[2] This question was only asked of respondents who answered affirmatively to question 1. Calculations were based on a sample of 82,961 respondents for U.S. and 1,124 respondents for Oregon.
[3] This question was only asked to respondents who answered affirmatively to questions 1 and 2: Calculations are based on a sample of 17,498 respondents for U.S. and 301 respondents for Oregon
[4] Calculated CDC variables (see explanation in text report).
[5] p-values were calculated using a chi-square test comparing Oregon percentages to the U.S.
[6] Weighted column percentages [7] 95% Confidence Intervals.

In the stratified analysis by gender for 2002, we found that Oregon men were 13% more likely to keep a firearm around the house in comparison to U.S. men. Similarly, the prevalence of firearm ownership is higher among men than women for both Oregon and the U.S (Table 2A). Additionally, during the year 2002, the prevalence of household gun ownership was 80% higher among White Oregonians in relation to other groups (e.g., Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders). Furthermore, during 2002 white Oregonians were more likely to be at risk for living in a home with loaded and unlocked firearms in comparison to Oregonians from other groups. Similarly, 10% of Oregon men were living in a home with loaded and unlocked firearms in comparison to 6.7% of men in the rest of the U.S. (Table 2A)

Table 2A. Comparison of Oregon and National Data on Firearms. Stratification by Gender and Race/Ethnicity. Behavioral Risk Factor Surveillance System 2002

	Oregon				U.S.			
Are any firearms kept in or around your home?								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	34.23	[31.78,36.77]	46.62	[43.35,49.92]	28.06	[27.7,28.42]	41.36	[40.85,41.86]
No	65.77	[63.23,68.22]	53.38	[50.08,56.65]	71.94	[71.58,72.3]	58.64	[58.14,59.15]
	White		Other Groups[3]		White		Other Groups[3]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	43.49	[41.28,45.73]	24.12	[19.62,29.28]	40.43	[40.08,40.77]	18.18	[17.63,18.75]
No	56.51	[54.27,58.72]	75.88	[70.72,80.38]	59.57	[59.23,59.92]	81.82	[81.25,82.37]
Are any of these firearms now loaded?								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	20.29	[16.98,24.05]	30.11	[26.11,34.45]	16.72	[16.18,17.26]	26.97	[26.32,27.64]
No	79.71	[75.95,83.02]	69.89	[65.55,73.89]	83.28	[82.74,83.82]	73.03	[72.36,73.68]
	White		Other Groups[3]		White		Other Groups[3]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	25.69	[22.82,28.78]	27.09	[18.82,37.32]	21.61	[21.16,22.08]	28.73	[27.24,30.28]
No	74.31	[71.22,77.18]	72.91	[62.68,81.18]	78.39	[77.92,78.84]	71.27	[69.72,72.76]
Are any of these loaded also unlocked?								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	63.47	[53.59,72.33]	71.6	[63.57,78.45]	56.94	[55.13,58.74]	61.74	[60.28,63.19]
No	28.4	[21.55,36.43]	36.53	[27.67,46.41]	43.06	[41.26,44.87]	38.26	[36.81,39.72]
	White		Other Groups[3]		White		Other Groups[3]	
	%[1]	[95%C]I[2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	70.95	[64.44,76.69]	55.65	[36.36,73.37]	61.49	[60.28,62.7]	54.8	[51.63,57.94]
No	29.05	[23.31,35.56]	44.35	[26.63,63.64]	38.51	[37.3,39.72]	45.2	[42.06,48.37]
Living in home with loaded firearm.								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	6.797	[5.633,8.181]	13.95	[11.94,16.22]	4.529	[4.374,4.69]	11.0	[10.69,11.31]
No	93.2	[91.82,94.37]	86.05	[83.78,88.06]	95.47	[95.31,95.63]	89.0	[88.69,89.31]
	White		Other Groups[3]		White		Other Groups[3]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	6.321	[4.298,9.202]	11.05	[9.735,12.53]	8.571	[8.37,8.776]	5.027	[4.727,5.345]
No	93.68	[90.8,95.7]	88.95	[87.47,90.26]	91.43	[91.22,91.63]	94.97	[94.65,95.27]
Living in home with loaded and unlocked firearm.								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	4.314	[3.416,5.435]	9.985	[8.301,11.97]	2.543	[2.429,2.662]	6.741	[6.506,6.984]
No	95.69	[94.57,96.58]	90.02	[88.03,91.7]	97.46	[97.34,97.57]	93.26	[93.02,93.49]
	White		Other Groups[3]		White		Other Groups[3]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	7.843	[6.734,9.117]	3.517	[2.131,5.752]	5.227	[5.072,5.388]	2.712	[2.5,2.941]
No	92.16	[90.88,93.27]	96.48	[94.25,97.87]	94.77	[94.61,94.93]	97.29	[97.06,97.5]

[1] Weighted column percentages [2] 95% Confidence Intervals.
[3] Other groups includes Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders.

In 2004, all three questions were asked, and while the CDC did not provide their computed measures, we provide the calculate results in our stratified analysis (see Table 3A). In 2004, the national prevalence of household firearm ownership was estimated to be 32.3% (95% CI: 32.0 – 32.7%) in comparison to 39.8% in Oregon (95% CI: 38.2 – 41.5%), which means that the prevalence of firearms in Oregon was over 1.2 times larger than the national prevalence. This finding was statistica lly

significant (p<0.00001) (Table 3). In addition, the proportion of respondents that answered yes to whether the firearms were loaded was 22.5% (95%CI: 22.0 – 22.9%) for the national sample compared to 25.8% (95% CI: 23.4 – 28.4%) in Oregon. Furthermore, 60.7% (95% CI: 59.4 – 61.9%) of respondents in the national sample affirmed that the loaded firearms were unlocked in comparison to 64.4% (95% CI: 58.9 – 69.5%) of Oregon respondents. These findings were also statistically significantly higher for Oregon (Table 3).

Table 3. Comparison of Oregon and National Data on Firearms. Behavioral Risk Factor Surveillance System 2004

	Oregon (respondent n=4,814)		**U.S.** (respondent n=285,884)	
Variable	%[5]	[95%CI][6]	%[5]	[95% CI][6]
4. Are any firearms kept in or around your home?[1]				
Yes	39.8	[38.2, 41.5]	32.3	[32.0, 32.7]
No	60.2	[58.5, 61.8]	67.7	[67.3, 68.0]
		p[4]= 0.0001		
5. Are any of these firearms now loaded?[2]				
Yes	25.8	[23.4, 28.4]	22.5	[22.0, 22.9]
No	74.2	[71.6, 76.6]	77.5	[77.1, 78.0]
		p[4]= 0.005		
6. Are any of these loaded also unlocked?[3]				
Yes	64.4	[58.9, 69.5]	60.7	[59.4, 61.9]
No	35.6	[30.5, 41.1]	39.3	[38.1, 40.6]
		p[4]= 0.185		

[1]This question was asked of all survey respondents.
[2] This question was only asked of respondents who answered affirmatively to question 1. Calculations were based on a sample of 102,896 respondents for U.S. and 1,786 respondents for Oregon.
[3] This question was only asked to respondents who answered affirmatively to questions 1 and 2: Calculations are based on a sample of 22,555 respondents for U.S. and 439 respondents for Oregon.
[4] p-values were calculated using a chi-square test comparing Oregon percentages to the U.S.
[6] Weighted column percentages [7] 95% Confidence Intervals.

In the 2004 gender analysis, Oregon men were 17.5% more likely to keep a firearm around the house compared to U.S. men. Similarly, the prevalence of firearm ownership was higher among men than women for both Oregon and the U.S (Table 3A). Additionally, the prevalence of household gun ownership was twice as likely among White Oregonians in relation to other racial and ethnic groups (e.g., Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders). Furthermore, during 2004 white Oregonians were more likely to be at risk for living in a home with loaded and unlocked firearms in comparison to Oregonians from other racial groups. Similarly, 9.7% of Oregonian men were living in a home with loaded and unlocked firearms in comparison to 6.3% of men in the rest of the U.S. (Table 3A)

Table 3A. Comparison of Oregon and National Data on Firearms. Stratification by Gender and Race/Ethnicity. Behavioral Risk Factor Surveillance System 2004

	Oregon				U.S.			
Are any firearms kept in or around your home?								
	Women		**Men**		**Women**		**Men**	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	34.08	[32.17,36.05]	45.88	[43.24,48.53]	26.14	[25.78,26.5]	39.06	[38.52,39.61]
No	65.92	[63.95,67.83]	54.12	[51.47,56.76]	73.86	[73.5,74.22]	60.94	[60.39,61.48]
	White		Other Groups[4]		White		Other Groups[4]	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	43.45	[41.7,45.22]	21.79	[18.03,26.07]	39.26	[38.9,39.62]	16.31	[15.74,16.9]
No	56.55	[54.78,58.3]	78.21	[73.93,81.97]	60.74	[60.38,61.1]	83.69	[83.1,84.26]
Are any of these firearms now loaded?								
	Women		**Men**		**Women**		**Men**	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	16.91	[14.38,19.79]	32.55	[28.94,36.39]	16.75	[16.16,17.35]	26.47	[25.76,27.19]
No	83.09	[80.21,85.62]	67.45	[63.61,71.06]	83.25	[82.65,83.84]	73.53	[72.81,74.24]
	White		Other Groups[4]		White		Other Groups[4]	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	25.27	[22.89,27.81]	30.75	[20.64,43.13]	21.31	[20.85,21.79]	28.38	[26.6,30.22]
No	74.73	[72.19,77.11]	69.25	[56.87,79.36]	78.69	[78.21,79.15]	71.62	[69.78,73.4]
Are any of these loaded also unlocked?								
	Women		**Men**		**Women**		**Men**	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	62.68	[53.84,70.76]	65.03	[58.09,71.38]	57.62	[55.65,59.55]	62.0	[60.46,63.52]
No	37.32	[29.24,46.16]	34.97	[28.62,41.91]	42.38	[40.45,44.35]	38.0	[36.48,39.54]
	White		Other Groups[4]		White		Other Groups[4]	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	63.56	[57.9,68.87]	71.64	[48.81,87]	61.75	[60.49,62.98]	56.32	[52.61,59.96]
No	36.44	[31.13,42.1]	28.36	[13,51.19]	38.25	[37.02,39.51]	43.68	[40.04,47.39]
Living in home with loaded firearm.[1]								
	Women		**Men**		**Women**		**Men**	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	5.617	[4.731,6.658]	14.87	[13.02,16.92]	4.261	[4.1,4.429]	10.29	[9.977,10.6]
No	94.38	[93.34,95.27]	85.13	[83.08,86.98]	95.74	[95.57,95.9]	89.71	[89.4,90.02]
	White		Other Groups[4]		White		Other Groups[4]	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	10.86	[9.757,12.08]	6.558	[4.087,10.36]	8.275	[8.078,8.476]	4.515	[4.187,4.867]
No	89.14	[87.92,90.24]	93.44	[89.64,95.91]	91.73	[91.52,91.92]	95.49	[95.13,95.81]
Living in home with loaded and unlocked firearm.[1]								
	Women		**Men**		**Women**		**Men**	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	3.487	[2.794,4.343]	9.668	[8.13,11.46]	2.431	[2.31,2.558]	6.322	[6.074,6.58]
No	96.51	[95.66,97.21]	90.33	[88.54,91.87]	97.57	[97.44,97.69]	93.68	[93.42,93.93]
	White		Other Groups[4]		White		Other Groups[4]	
	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]	%[2]	[95%CI][3]
Yes	6.885	[5.994,7.897]	4.698	[2.576,8.416]	5.063	[4.91,5.221]	2.518	[2.25,2.817]
No	93.12	[92.1,94.01]	95.3	[91.58,97.42]	94.94	[94.78,95.09]	97.48	[97.18,97.75]

[1]Calculated variables.
[2] Weighted column percentages [3] 95% Confidence Intervals.
[4] Other racial groups includes Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders.

In general terms, Oregon households were consistently and statistically significantly more likely to report firearms in the home before 2011. They also reported guns were more likely to be loaded, and these guns were less likely to be locked compared to the respondents from national household data. However, newly release data from the CDC indicate the trend reversed for the year 2017. In 2017, the prevalence of firearm ownership in Oregon was 40.0%, similar to the year 2004 (39.8%). In addition, there was no statistically significance difference between Oregon and the rest of the U.S. in the prevalence of household firearm ownership. In 2017, Oregonians were less likely to live in homes with loaded firearms with respect to other U.S. adults (12.2% vs 18.1% respectively) (Table 4).

In the 2017 gender analysis, Oregon men were as likely to keep a firearm around the house as other U.S. men. Consistent with earlier years, the prevalence of firearm ownership was higher among men than women for Oregon and the U.S (Table 4A). Additionally, the prevalence of household gun ownership was 85% more likely among White Oregonians compared to other groups (e.g., Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders). Furthermore, white Oregonians were more likely to be at risk for living in a home with loaded and unlocked firearms compared to Oregonians from other racial and ethnic groups. Although the proportion of Oregonians living in a home with a loaded and unlocked firearm was lower than the nation (for the year 2017), at least 6% of Oregonians were at risk (see Table 4A).

Table 4. Comparison of Oregon and National Data on Firearms. Behavioral Risk Factor Surveillance System 2017

	Oregon (respondent n=3,940)		**U.S.** (respondent n=285,884)	
Variable	%[5]	[95%CI][6]	%[5]	[95% CI][6]
6. Are any firearms kept in or around your home?[1]				
Yes	40.0	[38.2, 41.9]	39.6	[32.0, 32.7]
No	60.0	[58.1, 61.8]	67.7	[67.3, 68.0]
		p^5= 0.7737		
7. Are any of these firearms now loaded?[2]				
Yes	30.8	[28.2, 33.6]	46.3	[42.9, 49.8]
No	69.2	[66.4, 71.8]	53.7	[50.2, 57.1]
		p^5= 0.0001		
8. Are any of these loaded also unlocked?[3]				
Yes	49.3	[44.2, 54.4]	58.0	[52.8, 63.0]
No	50.7	[45.6, 55.8]	42.0	[36.9, 47.2]
		p^5= 0.0189		
9. Living in home with loaded firearm.[4]				
Not at risk	87.8	[86.6, 89.0]	81.9	[80.2, 83.5]
At Risk	12.2	[11.0, 13.4]	18.1	[16.5, 19.8]
		p^5= 0.0001		
10. Living in home with loaded and unlocked firearm.[4]				
Not at Risk	94.0	[93.2, 94.8]	89.6	[88.2, 90.9]
At Risk	6.0	[5.2, 6.8]	10.4	[9.2, 11.8]
		p^5= 0.0001		

[1]This question was asked of all survey respondents.
[2] This question was only asked of respondents who answered affirmatively to question 1. Calculations were based on a sample of 6,006 respondents for U.S. and 1,538 respondents for Oregon.
[3] This question was only asked to respondents who answered affirmatively to questions 1 and 2: Calculations are based on a sample of 1462 respondents for U.S. and 255 respondents for Oregon.
[4] Calculated CDC variables (see explanation in text report).
[5] p-values were calculated using a chi-square test comparing Oregon percentages to the U.S.
[6] Weighted column percentages [7] 95% Confidence Intervals.

Table 4A. Comparison of Oregon and National Data on Firearms. Stratification by Gender and Race/Ethnicity. Behavioral Risk Factor Surveillance System 2017

	Oregon				U.S.			
Are any firearms kept in or around your home?								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	34.20	[31.87,36.61]	46.58	[43.76,49.42]	32.59	[29.86,35.45]	47.34	[40.85,41.86]
No	65.80	[63.39,68.13]	53.42	[50.58,56.24]	67.41	[64.55,70.14]	55.66	[49.38,55.91]
	White		Other Groups[4]		White		Other Groups[4]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	44.29	[42.29,46.31]	23.84	[19.95,28.22]	58.23	[55.36,61.06]	23.8	[21.04,26.8]
No	55.71	[53.69,57.71]	76.16	[71.78,80.05]	41.77	[38.94,44.64]	76.2	[73.2,78.96]
Are any of these firearms now loaded?								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	24.34	[20.95,28.09]	35.99	[32.23,39.93]	37.68	[32.72,42.93]	52.78	[48.19,57.32]
No	75.66	[71.91,79.05]	64.01	[60.07,67.77]	62.32	[57.07,67.28]	47.22	[42.68,51.81]
	White		Other Groups[4]		White		Other Groups[4]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	29.87	[27.16,32.72]	37.19	[28.56,46.71]	47.63	[36.73,50.58]	43.53	[27.24,30.28]
No	70.13	[67.28,72.84]	62.81	[53.29,71.44]	52.37	[49.42,63.27]	56.47	[69.72,72.76]
Are any of these loaded also unlocked?								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	45.36	[37.26,53.72]	51.47	[44.97,57.93]	54.03	[45.28,62.53]	60.17	[53.65,66.34]
No	54.64	[46.28,62.74]	48.53	[42.07,55.03]	45.97	[37.47,54.72]	39.83	[33.66,46.35]
	White		Other Groups[4]		White		Other Groups[4]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	51.39	[45.92,56.83]	37.98	[24.7,53.35]	62.04	[56.21,67.53]	48.42	[37.85,59.12]
No	48.61	[43.17,54.08]	62.02	[46.65,75.3]	37.96	[32.47,43.79]	51.58	[40.88,62.15]
Living in home with loaded firearm.								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	8.1	[6.886,9.515]	16.64	[14.74,18.74]	12.1	[10.26,14.17]	24.73	[22.06,27.61]
No	91.9	[90.48,93.11]	83.36	[81.26,85.26]	91.9	[85.83,89.74]	75.27	[72.39,77.94]
	White		Other Groups[4]		White		Other Groups[4]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	13.04	[11.77,14.43]	8.752	[6.481,11.72]	27.57	[24.97,30.33]	10.09	[8.217,12.33]
No	86.96	[85.57,88.23]	91.25	[88.28,93.52]	72.43	[69.67,75.03]	89.91	[87.67,91.78]
Living in home with loaded and unlocked firearm.								
	Women		**Men**		**Women**		**Men**	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	3.66	[2.887,4.64]	8.48	[7.155,10.01]	6.34	[4.987,8.032]	14.87	[6.506,6.984]
No	96.34	[95.36,97.11]	91.52	[88.03,91.7]	93.66	[91.97,95.01]	85.13	[93.02,93.49]
	White		Other Groups[3]		White		Other Groups[3]	
	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]	%[1]	[95%CI][2]
Yes	6.637	[5.746,7.655]	3.324	[2.044,5.362]	16.96	[14.8,19.36]	4.829	[3.575,6.493]
No	93.36	[92.35,94.25]	96.68	[94.64,97.96]	83.04	[80.64,85.2]	95.17	[93.51,96.43]

[1] Weighted column percentages [2] 95% Confidence Intervals.
[3] Other racial groups includes Hispanics, Blacks, Asians, Native Americans, and Pacific Islanders.

During 1996-1998, the national data do not allow comparison by states, but the prevalence of firearms in households was fairly consistent at about 32%. Also during these three years, respondents were asked detailed questions: while not specific to Oregon, the data are interesting and cover issues such as multiple types of firearms, carrying a loaded firearm, reason for having firearms, confronting someone with a firearm, and if respondents had firearm safety training. These data are included as Tables 5-7 at the end of this report. These additional BRFSS questions may provide useful information about Oregonians and firearms and firearm safety in the future. For next steps in this research, asking similar questions on surveys taken throughout Oregon would be helpful to understanding how Oregonians relate to firearm ownership. This would enable more in-depth research on the various discrepancies that may exist among rural and non-rural populations pertaining to the culture of firearm ownership, storage, and training.

Table 5. National Data on Firearms. Behavioral Risk Factor Surveillance System 1996

Variable	U.S. (respondent n=14,029) % [1]	[95% CI] [2]
1. Are any firearms kept in or around your home?		
Yes	32.0	[30.9,33.2]
No	68.0	[66.8,69.1]
2. Are any of the firearms handguns, such as pistols or revolvers?		
Yes	57.7	[55.8,59.6]
No	42.3	[40.4,44.2]
3. Are any of the firearms long guns, such as rifles or shotguns?		
Yes	74.2	[71.9,76.4]
No	25.8	[23.6,28.1]
4. What is the main reason that there are firearms in or around your home?		
Hunting or Sport	64.6	[62.7,66.5]
Protection	20.0	[18.5,21.5]
Work	4.5	[3.7,5.4]
Some other reason	10.9	[9.9,12.1]
5. Is there a firearm in or around your home that is now both loaded and unlocked?		
Yes	15.7	[14.4,17.0]
No	84.3	[83.0,85.6]
6. During the last 30 days, have you carried a loaded firearm on your person, outside of the home for protection against people		
Yes	6.6	[5.6,7.7]
No	93.4	[92.3,94.4]
7. During the last 30 days, have you driven or been a passenger in a motor vehicle which you knew there was a loaded firearm?		
Yes	14.3	[13.0,15.8]
No	85.7	[84.2,87.0]
8. During the last 12 months, have you confronted another person with a firearm, even if you did not fire it, to protect yourself, your property, or someone else?		
Yes	1.3	[0.9,1.9]
No	98.7	[98.1,99.1]
9. In the past three years, have you attended a firearm safety workshop, class, or clinic		
Yes	12.7	[11.5,14.1]
No	87.3	[85.9,88.5]
10. Do any of the firearms kept in or around your home belong to you, personally?		
Yes	62.7	[60.8,64.5]
No	37.3	[35.5,39.2]

[1] Weighted column percentages [2] 95% Confidence Intervals.

Table 6. National Data on Firearms. Behavioral Risk Factor Surveillance System 1997

Variable	U.S. (respondent n=14,034) % [1]	95% CI [2]
1. Are any firearms kept in or around your home?		
Yes	28.8	[27.7,29.9]
No	71.2	[70.1,72.3]
2. Are any of the firearms handguns, such as pistols or revolvers?		
Yes	58.7	[56.5,61.0]
No	41.3	[39.0,43.5]
3. Are any of the firearms long guns, such as rifles or shotguns?		
Yes	74.8	[72.2,77.2]
No	25.2	[22.8,27.8]
4. What is the main reason that there are firearms in or around your home?		
Hunting or Sport	66.8	[64.7,68.9]
Protection	16.2	[14.8,17.9]
Work	3.7	[2.8,4.7]
Some other reason	13.3	[11.8,14.9]
5. Is there a firearm in or around your home that is now both loaded and unlocked?		
Yes	13.2	[11.9,14.7]
No	86.8	[85.3,88.1]
6. During the last 30 days, have you carried a loaded firearm on your person, outside of the home for protection against people		
Yes	4.9	[4.1,5.9]
No	95.1	[94.1,95.9]
7. During the last 30 days, have you driven or been a passenger in a motor vehicle which you knew there was a loaded firearm?		
Yes	11.4	[10.2,12.7]
No	88.6	[87.3,89.8]
8. During the last 12 months, have you confronted another person with a firearm, even if you did not fire it, to protect yourself, your property, or someone else?		
Yes	0.9	[0.6,1.4]
No	99.1	[98.6,99.4]
9. In the past three years, have you attended a firearm safety workshop, class, or clinic		
Yes	12.1	[10.6,13.7]
No	87.9	[86.3,89.4]
10. Do any of the firearms kept in or around your home belong to you, personally?		
Yes	66.8	[64.7,68.9]
No	33.2	[31.1,35.3]

[1] Weighted column percentages [2] 95% Confidence Intervals.

Table 7. National Data on Firearms. Behavioral Risk Factor Surveillance System 1998

Variable	U.S. (respondent n=9,142) %[1]	95% CI[2]
1. Are any firearms kept in or around your home?		
Yes	32.0	[30.9,33.2]
No	68.0	[66.8,69.1]
2. Are any of the firearms handguns, such as pistols or revolvers?		
Yes	60.5	[58.2,62.6]
No	39.5	[37.4,41.8]
3. Are any of the firearms long guns, such as rifles or shotguns?		
Yes	77.5	[75.1,79.7]
No	22.5	[20.3,24.9]
4. What is the main reason that there are firearms in or around your home?		
Hunting or Sport	71.5	[69.5,73.5]
Protection	15.1	[13.6,16.7]
Work	3.6	[2.9,4.5]
Some other reason	9.8	[8.6,11.1]
5. Is there a firearm in or around your home that is now both loaded and unlocked?		
Yes	12.7	[11.4,14.1]
No	87.3	[85.9,88.6]
6. During the last 30 days, have you carried a loaded firearm on your person, outside of the home for protection against people		
Yes	6.1	[5.2,7.3]
No	93.9	[92.7,94.8]
7. During the last 30 days, have you driven or been a passenger in a motor vehicle which you knew there was a loaded firearm?		
Yes	14.1	[12.7,15.7]
No	85.9	[84.3,87.3]
8. During the last 12 months, have you confronted another person with a firearm, even if you did not fire it, to protect yourself, your property, or someone else?		
Yes	1.1	[0.7,1.6]
No	98.9	[98.4,99.3]
9. In the past three years, have you attended a firearm safety workshop, class, or clinic		
Yes	12.9	[11.3,14.7]
No	87.1	[85.3,88.7]
10. Do any of the firearms kept in or around your home belong to you, personally?		
Yes	62.3	[60.1,64.4]
No	37.7	[35.6,39.9]

[1]Weighted column percentages [2] 95% Confidence Intervals.

Appendix III

Survey of Healthcare Providers Experiences with, and Perspectives Regarding Firearm Safety
(**v.**1.4.2021 revised with GVPHI feedback)

Executive Summary

Oregon Health & Science University conducted a web-based survey on firearm safety resulting in 589 responses from Oregon physicians, nurse practitioners, and physician (10.6% response). Respondents included 441 physicians (74.9%), 121 nurse practitioners (NPs) (20.5%), and 27 physician assistants (PAs) (4.6%). These healthcare providers estimated that between 44% and 49% of patient households have firearms, and between 35% and 53% have different types of firearms. These included shotguns (36.5%), and handguns (45.5%), and were owned for a range of purposes, including hunting (55.7%), personal protection (54.3%), recreational target shooting (40.2%), and gun collecting (28.2%). The survey's findings revealed a lack of awareness among these healthcare providers of existing programs to prevent firearm injuries, including emergency gun storage, free gunlocks, and cables. Physicians were statistically more likely than NPs and PAs to have treated firearm injuries with a broad range in the frequency of injuries treated (5.3-31.8 injuries). The majority of injuries were due to crime related shootings (33.6%) with minor accidental shootings at 31% and self-harm at 15.7%.

A majority (83%) of respondents reported that they did not assess every adolescent or adult patient they see about firearm injury prevention and this varied by provider type. Nearly 44% indicated that a known mental health issue, issues related to drugs or alcohol in the home (26%), or having children in the home (26%), are criteria they use to determine if they should provide patient counseling for firearm injury prevention. On average, respondents reported that about 27% of their patients would benefit from firearm injury prevention, though only about 20% actually reported counseling these patients. Importantly, greater than 48% think counseling is very important or extremely important. They reported a number of issues that prevent healthcare providers from counseling patients about firearm injuries, including lack of time (26%), patients not being open to counseling (18%), and forgetting to do it (21%). Most respondents thought (47%) that developing a practice-based protocol to address firearm injury prevention with patients would be helpful to them. Based on these key findings, we make the following recommendations.

Recommendations

1) Initiate a plan to add biannual survey modules that monitor firearm safety based on the existing Centers for Disease Control and Prevention (CDC) Oregon Healthy Teens, and Behavioral Risk Factor Surveillance System (BRFSS) Surveys.
2) Develop and disseminate Oregon-centric firearm safety counseling programs for healthcare providers.
3) Develop and disseminate tailored local media campaigns with community partners to address knowledge gaps and create communities informed about and committed to firearm safety.
4) Develop and disseminate a toolbox of practice-based protocols and other healthcare setting specific tools that will help to overcome logistical barriers to firearm counseling and provide access to low-cost firearm security equipment.
5) Monitor healthcare provider knowledge and emerging education needs in Oregon.
6) Foster the identification of a public health (OHA) practice "champion" for firearm safety to implement population surveillance, and better educational and counseling strategies in healthcare settings.

Introduction

Gun Violence as a Public Health Issue (GVPHI) is a program sponsored by the Center for Diversity and Inclusion (CDI) at Oregon Health & Science University (OHSU). The multi-method investigation involved a secondary data analysis, provider focus groups, and a provider survey. This report focuses on the healthcare provider survey. The primary aims of the survey component were to: 1) understand Oregon healthcare providers' clinical experiences with firearm injuries; 2) determine past training regarding firearm safety, and 3) determine their perspectives on the role they believe they should play in firearm safety.

This work was funded jointly by the Oregon State Legislature and OHSU's Office of the Provost. As a starting point to inform the development of the survey, we conducted an extensive review of published literature on health provider surveys related to firearm safety, interventions studied, and models for provider education that would inform work in Oregon State, including specific recommendations. Importantly, federal agencies were restricted from funding research on firearms starting in 1996 (The "Dickey Amendment," specifically enacted for the *Centers for Disease Control & Prevention*) and this extended to the *National Institutes of Health* in 2012. Thus, peer-reviewed literature on firearm injury prevention is limited.

Published Literature

Literature on Firearm Injuries and Epidemiology - Firearm violence is responsible for more than 67,000 injuries and 32,000 deaths each year (Fowler et al., 2015). A recent report by *Centers for Disease Control and Prevention (CDC)* reported 39,773 firearm-related deaths in 2017 (Kochanek et al., 2019) and suicide was the most common. Suicide risk, including by firearms, is most common among older white men. In 2017, the *CDC* reported 17,240 deaths by suicide for Non-Hispanic white men aged 45 and over (Curtin & Hedegaard, 2019). Less clear is how increased the risk is when firearms are readily available, although theoretically gun restrictions can be linked to suicide prevention (Yip, Caine, Yousuf, et al., 2012). Assuming increased risk exists, there is evidence that provider behaviors are currently not optimal for the provision of suicide prevention counseling and services. Data from the 2015 web-based *National Firearms Survey* suggested that a minority of adults knew that suicide was a more common cause of violent death than homicide, and that this was the case for firearm deaths (Morgan, Rowhani-Rahbar, Azrael, &Miller, 2018).

A study of U.S. Veterans revealed that medical records were unlikely to record that patients were screened for firearm access and impulsivity (unnecessarily risky behavior); and older patients were less likely to have received referrals or services, including mental health (Simons, Van Orden, Conner, & Bagge, 2019). However, mental health providers were more likely to document and refer patients for services in this study. Emergency Department nursing leaders (n=190) completed a telephone survey regarding their views on suicide prevention and lethal-means counseling (Betz, Brooks-Russel, Brandspigel, Novins, Tung, & Runyan, 2018). Though the level of support for counseling suicidal patients was high, the majority of respondents reported skepticism about successfully preventing suicide.

Literature on Healthcare Provider Research and Surveys - We found relatively few research publications about healthcare provider beliefs and practices related to firearm safety. In addition, original surveys were unavailable for a majority of articles reporting survey findings. The published and shared surveys produced an "item bank" to inform the development of our Oregon healthcare provider survey. Two older studies published in the late 1990s found that a high percentage of physicians believed they should provide counseling, though a small percent actually did this (Everett et al, 1997 and Barkin et al, 1998). A national survey of 271 family physicians (Everett et al, 1997) reported that 78% did not have formal training on counseling patients, and 84% never or rarely counseled patients. Half of the respondents believed firearm safety was a low priority for them. In a survey conducted by Barkin and colleagues (1998) of 325 Los Angeles pediatric nurse practitioners and family physicians, conducted during the same time, found that 80% said they should counsel, but only 38% did this.

A survey of internal medicine physicians (Butkus & Weissman, 2014) found that a majority expressed concerns about firearms and favored stricter gun control legislation, and 66% believed physicians should counsel patients. However, 58% reported they never ask patients about guns in their homes. Another more recent study, that involved primary care physicians rating vignettes about highly politicized issues (including

firearms) (Hersh & Goldenberg, 2016), compared their responses according to political party. In general, Democrats rated firearm issues as more serious than Republicans, and they urged patients not to store firearms at home. However, Republican physicians were significantly more likely to ask about safe firearm storage. Finally, while Damari and colleagues found that 65% of physicians reported they knew how to counsel patients, only 25% did (Damari, Ahluwalia, Viera, &Goldstein, 2018). Interestingly, the percentage was higher among respondents who had received Continuing Medical Education (CME) on the topic, suggesting an incentive path for provider education in Oregon.

Ketterer and colleagues surveyed emergency department (ED) physicians about their knowledge of firearms, including patients carrying firearms in the ED. Despite the finding that up to 25% of trauma patients carry weapons, the majority of physicians had no experience handling a firearm. Interestingly, a study that focused on patients' perceptions of ED physicians found that the majority (90%) did not think doctors were discriminating against them when they counseled about firearms. In addition, the majority of patients thought doctors *should* counsel on firearm safety (76%), and believed this would improve firearm storage (71%) (Boge, Dos Santos, Burkholder, Koschel, Cubeddu, & Farcy, 2019).

The *American Academy of Pediatrics* (AAP) has included questions about firearms in its Periodic Survey since 1994 (See Olson et al, 1997; 2007; 2020). The surveys asked about pediatricians' experiences treating gun injuries, counseling practices and views on gun injury prevention. The AAP fielded questions during 2019 (Olson et al., 2020), and found that "high portions of pediatricians, 90% or more, reported that violence prevention should be a pediatric priority." (Olson et al, 1997; 2007; 2020). Our local colleague, Dr. Ben Hoffman, introduced us to the AAP research group, who granted approval for use of any of their questions (with appropriate attribution). This allowed us comparative national data for pediatrics, and differences by/with other provider types may be interpretable based on the single provider specialty group. Overall, response to the AAP survey has decreased over time. Some measures about firearm safety have fallen somewhat (e.g., fewer providers asking about firearms in the home) and some have fallen dramatically for pediatricians answering that they should ask parents to remove handguns from the home (65% yes to 40% yes). However, pediatricians have been consistent about asking parents to unload and lock their firearms (95% to 96% across all four surveys).

The *National Institute of Mental Health* (NIMH) consortium directed at implementation of firearm safety in pediatric settings interviewed 82 primary care practices in two healthcare systems to better understand the *Safety Check* protocol (Wolk et al., 2017: Screening, brief counseling, provision of firearm locks). Shari Jager-Hyman and colleagues (2019) conducted a qualitative study on the perspectives of firearm stakeholders concerning the *Safety Check,* which revealed that while most stakeholders interviewed agreed about the acceptability of counseling and provision of firearm locks, they did not feel the same way about screening for firearm ownership as an acceptable intervention approach. Additional results are forthcoming, as the survey data (mixed methods) are not yet available. Rinad, Beidas, and colleagues (2019) evaluated the *Safety Check* and concluded that the acceptability of screening for firearms and safe storage counseling was high among primary care physicians. Goldstick and colleagues (2017) developed a 10-point screening tool for high-risk teens predicting firearm violence that might be useful in some settings (e.g., Emergency Departments [ED]). A North Carolina survey of adults whose children were seen in an ED found that parents had poor to modest concordance on firearm ownership and safety, concluding that provider-based interventions and counseling should include both partners in pediatric settings (Coyne-Beasley et al., 2005).

Literature on Firearm Safety and Safety Interventions - We identified one case-control study that found that safe firearm storage devices and practices were protective against both youth suicide and unintentional firearm injuries (Grossman, Mueller, Riedy, et al., 2005). Data from a Washington State population survey (the Behavioral Risk Factor Surveillance System [BRFSS]) (Morgan, Gomez, &Rowhani-Rahbar, 2018) indicates the potential for increased injury or suicide risk among adults with higher prevalence of alcohol misuse in firearm-owning households have unsafe firearm storage.

To date, clinically delivered interventions to improve firearm safety have mixed results. Stevens and colleagues concluded that except for bicycle helmet use, there were no significant effects of any injury-prevention interventions in pediatric practices, including safe gun storage. Grossman and colleagues (2000)

examined the effect of gun counseling in pediatric settings among physicians, nurse practitioners, and physician assistants. There were no important differences in acquisition of new guns by their patients, or removal of firearms from the home, but there was an observed increase in the proportion of their patients that purchased gunlocks (8% in the intervention group, versus 2.5% among controls).

In another randomized controlled trial (information only vs. counseling), Barkin and colleagues reported a substantial increase in storing firearms with cable locks for the intervention group, compared to a decrease i the control group (Barkin et al., 2008). There may be promise in an important study funded by the National Institute of Mental Health. The project (Wolk and colleagues, 2017) seeks to understand provider barriers, and then test the implementation of a parental firearm safety intervention (*Firearm Safety Check*). They conducted electronic surveys of leaders of 83 primary care practices (the survey is not available). In a follow-up study analyzing the completed surveys, Beidas and colleagues (2019) found that while acceptability for screening and counseling was generally high among primary care physicians, the provision of firearm locks did not rate highly in terms of acceptability. Primary care physicians with personal experience with suicide were more likely to find intervention strategies more acceptable. These investigators concluded that future research should be dedicated to personal experience-based narrative approaches and easier intervention implementation.

While research on clinical interventions is limited, providers and provider organizations support counseling/prevention in healthcare settings. For example, the *American Pediatric Surgical Association* strongly supports provider counseling on firearm safety and gun control measures (Petty, Henry, Nance, Ford, and the APSA, 2019). In addition, Parent (2016) describes a generally positive effect of physician-initiated counseling, and recommends specific non-judgmental language and using objective information. He also promotes the direct conversation of firearm safety and storage. In another study of medical education and training, Puttaguna and colleagues (2016) reported results of a formal literature review on firearm safety training among students in healthcare professions, and found only four studies with limited types of learner groups. They concluded that inadequate examples of training exist, that there is very spare evidence of formal evaluations and outcomes, and that firearm safety education should be a much higher priority in healthcare.

Survey Study Methods

Study Design and Population Sample -This cross-sectional study involved administering a survey about firearm experiences and safety to a weighted sample of 6,972 physicians, physician assistants, and nurse practitioners. The weighted sample was derived from approximately 13,900 allopathic and osteopathic physicians, 1,800 physician assistants, and 3,200 nurse practitioners licensed to practice within the state of Oregon. We do not know if respondents reside in Oregon Physician and physician assistant participants were those licensed to practice in Oregon at the time of the survey who we selected using our sampling framework (**Table 1 – next page**). The nurse practitioner sampling framework is included in **Table 2 (next page)**. We excluded dentists, podiatrists, naturopathic, chiropractic physicians and nurses who were not nurse practitioners. In addition, physician specialties with limited direct clinical patient interactions were also excluded (e.g., nuclear medicine). The Oregon Medical Association (OMA) enabled access to the contact information they maintain on licensed MDs, DOs, and PAs (Doctor of Medicine, Doctor of Osteopathic Medicine, and Physician Assistant). The Oregon State Board of Nursing (OSBN) provided access to their contact information on licensed nurse practitioners (NP) and nurse practitioners with dispensing privileges (DP). We selected a random sample of providers based on disciplines.

Survey Design and Development - Using the results of the literature review and an item bank we compiled across different survey questions, we developed a 53-item survey with three sections: 1) Demographic and practice information; 2) Information about firearms in your community; and 3) Information about experiences with firearms and firearm safety (See **Appendix A)**. Because survey length can affect response rates, we sought to keep the survey short enough to complete in about 10 minutes. After reviewing, selecting items, and engaging key stakeholders for review of the survey draft, we used cognitive interviewing techniques (Willis GB, 2004) to test the survey with every respondent type (physicians, nurse practitioners, and physician assistants). Undertaking this step allowed us to be confident the items were understandable by different types of healthcare providers; that the question order was not leading or did not introduce bias into responses; and estimated the time for survey completion. We completed four rounds of cognitive interviews before finalizing the survey.

Table 1. Physician and Physician Assistant Sampling Framework for Firearm Survey

Physician Medical Specialties (American Board of Medical Specialties)†	Included (Yes/No)	Rationale for Exclusion	Weights
Allergy and Immunology (n=40) n=12	Yes		*
Anesthesiology	**No**	Limited patient interaction	--
Colon and Rectal Surgery (n=16) n=5	Yes		*
Dermatology (n=220) n=66	Yes		*
Emergency Medicine (n=1006) n=604	Yes		***
Family Medicine (n=2395) n=1078	Yes		**
Internal Medicine (n=2630) n=1184	Yes		**
Medical Genetics and Genomics	**No**	Patient care spectrum too narrow	--
Nuclear Medicine	**No**	Patient care spectrum too narrow	--
Neurology (n=246) n=74	Yes		*
Neurological Surgery (n=160) n=48	Yes		*
Obstetrics and Gynecology (n=617) n=185	Yes		*
Ophthalmology (n=350) n=105	Yes		*
Otolaryngology – Head and Neck Surgery (n=266) n=120	Yes		**
Orthopedic Surgery (n=591) n=266	Yes		**
Pathology	**No**	Limited patient interaction	--
Pediatrics (n=976) n=293	Yes		*
Physical Medicine and Rehabilitation (n=137) n=62	Yes		**
Plastic Surgery (n=90) n=41	Yes		**
Preventive Medicine (n=22) n=13	Yes		***
Psychiatry (n=42) n=19	Yes		**
Radiology	**No**	Limited patient interaction	--
Surgery (n=3) n=2	Yes		***
Thoracic Surgery (n=69) n=31	Yes		**
Urology (n=183) n=55	Yes		*

†Sampling could change based on # represented in Oregon

Random sample 30% of disciplines with *. Random sample 45% of disciplines with **
Random sample 60% of disciplines with ***

Table 2. Nurse Practitioner Sampling Framework for Firearm Survey

Nurse Practitioner Specialties According to the OSBN	Include (Yes/No)	Rationale for Exclusion	Weights
Acute (n=86 or 2%) n=52	Yes	N/A	***
Adult (n=347 or 7.5%) n=156	Yes	N/A	**
Adult-Gerontology Acute Care (n=87 or 2%) n=26	Yes	N/A	*
Adult-Gerontology Primary Care (n=131 or 2.8%) n=59	Yes	N/A	**
Family (n=2,532 or 54.7%) n=1,139	Yes	N/A	**
Geriatric (n=35 or 1%) n=16	Yes	N/A	**
Neonatal (n=62 or 1%) n=19	Yes	N/A	*
Nurse midwife (n=361 or 8%) n=162	Yes	N/A	**
Pediatric (n=123 or 2.7%) n=55	Yes	N/A	**
Pediatric acute care (n=11 or <1%)	**No**	Group too small for meaningful data	--
Pediatric Primary Care (n=51 or 1%) n=23	Yes	N/A	**
Psychiatric/Mental Health (n=676 or 14.6%) n=304	Yes	N/A	**
Women's health (n=127 or 2.7%) n=57	Yes	N/A	**
Total (n=4,629) n=2,073 or 44.8% overall			

Random sample 30% of disciplines with *Random sample 45% of disciplines with **
Random sample 60% of disciplines with ***

Recruitment Activities and Survey Administration - We compiled provider contact information, including e-mail addresses, from the Oregon Medical Association (the OMA) for physicians and physician assistants, and from the Oregon State Board of Nursing (OSBN) for nurse practitioners. Both associations and OHSU completed Letters of Agreement. We contacted prospective participants by e-mail and invited them to complete the survey. The e-mail included the following: a cover letter from Elena Andresen, PhD, OHSU Provost; an information sheet that described the survey study in detail; and a link to the survey, using Qualtrics,[xm] an online survey platform. OHSU's Institutional Review Board (IRB #19714) approved all study activities. We planned up to four participant contacts to obtain a target response rate of 75%. The survey was launched on October 22nd, 2019 and closed on March 16th, 2020.

Challenges with Survey Response Rates and Our Plans - Based on the peer-reviewed literature, we recognized that survey response would be a challenge for our Oregon study. Everett and colleagues (1977) reported 55% response to a three-wave mailed survey sponsored by, and mailed from the *American Academy of Family Physicians*. However, Barkin and colleagues reported 70% response to a mailed survey in Los Angeles (1998), potentially due to the "local" nature of the survey. Butkus and Weisman (2014) reported 56.5% response from internists at the national level. Damari and colleagues mailed surveys to 600 physicians of the *North Carolina Medical Board* and some physicians received a small (<$1) incentive. Their final response was 40%. Hersh and Goldenberg (2016) sent surveys to 1,529 primary care physicians in 29 states with 20% response. The results of electronically delivered surveys on provider counseling on firearm safety is unknown, but the NIMH consortium project (Wolk et al., 2017) provided some idea of possible future methods and response. As reported above, the AAP reported decreasing response: 69% in 1994 dropping to 44% in 2013. Many factors can affect survey response rates, such as competing health concerns or timing over holidays or summer. In general, survey response rates (via paper or online, as in the AAP described above) have decreased. Web-based surveys result in lower response than mailed or interviewer modes. Pressures on clinician time for "face time" with patients is one important barrier to response of providers in any mode.

Because of the limited published success with provider surveys, we adopted several strategies to improve response rate. First, we used current email addresses as a first-line (low cost) web-based survey delivery mode. We followed with more intensive efforts using regular mail methods. Second, we limited our Oregon State provider survey population to physicians and two larger groups of advanced practice providers: Physician Assistants, and Nurse Practitioners. This reduced the potential for small samples where we might not be able to interpret data accurately. Third, we used a sampling strategy to survey a smaller but representative sample of providers, to maximize our efforts of increasing response with more intensive follow-up in a smaller sample. We used a weighted sampling frame, where smaller groups (e.g., preventive medicine

physicians; acute care NPs) were randomly sampled at a higher rate, e.g., 60% of their number, and larger groups (e.g., pediatric physicians) were sampled at 30% of their number. In total, we sampled almost 5,000 healthcare providers in these groups out of about 19,000 licensed members of these professions. Finally, we collaborated with the *Oregon Medical Association*, whose support included their logo on our survey invitations. The OMA members also developed a deep interest in firearm safety, and helped develop and legitimize the survey.

Data Analyses –We used Analysis of Variance (ANOVA) mixed model to assess continuous variables, and Chi Square assessed categorical variables. All tests were two-sided, and alpha was set at 0.05 to assess statistical significance. Numbers and percents vary due to missingness, which was <5%. In some cases, precise missingness was unknown and we present descriptive statistics without showing statistical significance. In these cases, meaningful results may be slightly under-estimated. Because missingness was so low, we did not reweight the data for analyses. To explore gun ownership and safety perceptions in rural versus urban settings, we collapsed the categories of village, small town, and large town into a rural category, and small and large city into an urban category. Cells with n < 5 have been censored (denoted by …) to prevent possible identification of participants.

Results

Response Rates and Participants- A total of 5,563 surveys were administered, with up to four reminders sent to non-responders. Partially and fully completed surveys were returned by 589 participants (10.6% response) (**Table 3, next page)**, and 49 participants opted out. One paramedic inadvertently completed the survey and their data were excluded.

Table 3. Firearm Survey Response Rates According to Type of Healthcare Provider

Type of Healthcare Provider	n (Column %)	n for Full Survey Responses (Row %)	n for Partial Survey Responses (Row %)
MD/DO†	441 (74.9%)	340 (77.1%)	101 (22.9 %)
NP†	121 (20.5%)	87 (71.9%)	34 (28.1%)
PA†	27 (4.6%)	19 (70.4%)	8 (29.6%)
TOTALS	*589 (100%)*	*446 (100%)*	*143 (100%)*

Demographic and practice characteristics of the participants are shown in **Table 4**. The mean age overall was 48.6 years, with a range of 28-82. A slight majority were women (51.4%), and the respondents were a majority White (84.3%), non-Hispanic (96.5%), and have children living at home (55.2%). We found statistical differences for gender identity, Race, and parental status according to healthcare discipline. Physician participants completed their training between 1968 and 2019 with a mean year of completion of 2003 (standard deviation [SD]=11.9 years), and nurse practitioners and physician assistants completed their training between 1974 and 2018 with a mean year of completion of 2006 (SD=10.4 years (*Data not shown*)).

Table 4. Participant Demographic Characteristics

Provider Characteristics	All	MD/DO	NP	PA	*p* value
	Number - n (%)				
	n=573	n=430	n=118	n=25	
Mean Age (±Standard deviation)	48.6 (11.7)	48.8 (11.9)	48.0 (11.5)	47.1 (9.7)	0.64
Range	28-82	29-82	28-68	34-68	
Gender Identity	n=588	n=440	n=121	n=27	
Male	272 (46.3)	247 (56.1)	15 (12.4)	10 (37.0)	
Female	302 (51.4)	180 (40.9)	105 (86.8)	17 (63.0)	**<0.001**
Genderqueer/Gender non-conforming	…	…	…	…	
Prefer not to answer	10 (1.7)	9 (2.0)	…	…	
Prefer to describe (text)	…	…	…	…	
Race	n=586	n=438	n=121	n=27	
White	494 (84.3)	366 (83.6)	104 (86.0)	24 (88.9)	
Black	…	…	…	…	
Asian or Pacific Islander	39 (6.7)	30 (6.8)	9 (7.4)	…	**0.02**
American Indian/Native Alaskan	…	…	…	…	
Two or more races	13 (2.2)	10 (2.3)	…	…	
Others	7 (1.2)	5 (1.1)	…	…	
Prefer not to answer	28 (4.8)	25 (5.7)	…	…	
Ethnicity	n=566	n=421	n=118	n=27	
Hispanic	21 (3.7)	17 (4.0)	…	…	0.48
Non-Hispanic	546 (96.5)	404 (96.0)	116 (98.3)	26 (96.3)	
Parental Status	n=585	n=439	n=119	n=27	**0.05**
Has children living at home (% Yes)	323 (55.2)	252 (57.4)	54 (45.4)	17 (63.0)	
… cell contains less than 5 respondents					

Physician participants completed their training between 1968 and 2019 with a mean year of completion of 2003 (standard deviation [SD]=11.9 years), and nurse practitioners and physician assistants completed their training between 1974 and 2018 with a mean year of completion of 2006 (SD=10.4 years (*Data not shown*). Among NPs and PAs who reported their discipline (n=147), 36.7% (n=54) reported being in family medicine, 4.8% (n=7) reported being in internal medicine, 7.5% (n=11) reported being in general pediatrics, 36.1% (n=53) reported being in a sub-specialty, and 15% (n=22) reported being in an "other" category (*Data not shown*).

Table 5 illustrates characteristics of the practice settings among participants according to type of healthcare provider. Although outpatient volume did not vary among types of healthcare providers, type of care provided did: NPs and PAs provided more outpatient care compared to physicians. **Table 5** also illustrates the patient and community characteristics where participants provide care. Of note is that NPs and PAs provide more care to Medicaid patients compared to physician participants, and PAs see fewer Asian/Pacific Islander patients compared to physicians and NPs.

Table 5. Patient and Community Characteristics Where Participants' Provide Care

Patient/Community Characteristics	All	MD/DO	NP	PA	*p value*
	Means as % and (SD) Except where otherwise noted				
Estimate patient payment methods in your setting	n=486	n=361	n=103	n=22	
Private health insurance	30.1 (41.2)	30.5 (45.0)	29.1 (29.2)	29.1 (18.4)	0.95
Medicare	17.6 (18.6)	17.8 (18.5)	16.5 (19.9)	20.4 (14.0)	0.64
Medicaid	21.8 (24.0)	20.1 (22.9)	26.0 (27.3)	30.5 (21.2)	**0.02**
Other Federal (e.g., Veterans' Affairs)	4.6 (16.9)	4.6 (16.8)	5.2 (19.0)	2.1 (4.0)	0.74
Uninsured	7.5 (47.0)	7.8 (53.7)	6.3 (15.4)	9.6 (21.3)	0.94
Other	3.1 (15.9)	3.7 (17.1)	1.07 (9.9)	3.9 (18.1)	0.33
Unable to estimate payment methods	n=118	n=90	n=26	n=2	--
Patient population's ethnicity	n=487	n=361	n=104	n=22	0.95
Hispanic or Latino	17.9 (15.1)	17.7 (15.5)	18.3 (13.1)	18.3 (17.5)	
Non-Hispanic or Non-Latino	82.1 (15.5)	82.3 (15.5)	81.7 (13.1)	81.7 (17.5)	
Patient population's race	n=487	n=361	n=26	n=22	
White	78.4 (18.7)	78.3 (19.3)	77.5 (17.5)	83.9 (13.5)	0.34
Black or African American	6.1 (6.6)	6.1 (6.6)	6.3 (7.0)	5.5 (5.9)	0.87
Asian/Pacific Islander	5.5 (5.5)	5.2 (5.2)	6.7 (6.6)	3.7 (3.0)	**0.02**
American Indian/Alaska Native	2.6 (4.5)	2.7 (4.9)	2.5 (3.2)	1.6 (2.6)	0.49
Two or more races	2.5 (8.6)	2.8 (9.6)	2.1 (4.4)	0 (0.0)	0.28
Other	4.9 (15.3)	4.9 (15.5)	4.9 (15.2)	5.2 (12.7)	0.99
Community Size in Detail	n=487	n=361	n=104	n=22	
	n (%)	n (%)	n (%)	n (%)	
Village	…	…	…	…	
Small town	78 (16.0)	47 (13.0)	25 (24.0)	6 (27.3)	**0.03**
Large town	130 (26.7)	100 (27.7)	25 (24.0)	5 (22.7)	
Small City	95 (19.5)	72 (19.9)	16 (15.4)	7 (31.8)	
Large City	183 (37.6)	142 (39.3)	37 (35.6)	…	
Community Size Collapsed	n=487	n=361	n=104	n=22	
	n (%)	n (%)	n (%)	n (%)	0.25
Rural	209 (42.9)	147 (40.7)	51 (51.0)	11 (50.0)	
Urban	278 (57.1)	214 (59.3)	53 (49.0)	11 (50.0)	

… cell contains less than 5 respondents

Perspectives on Firearm Use and Safety in Patient Catchment Area

Table 6a (next page) illustrates participants' perspectives on firearm use and safety in their patient catchment areas. Participants estimated that between 44% and 49% of households in their catchment area have firearms, and between about 35% and 53% have different types of firearms from shotguns (36.5%) to handguns (45.5%), with a range of purposes, including hunting (55.7%), personal protection (54.3%), target shooting (40.2%) and gun collecting (28.2%). The data show that healthcare providers lack awareness of existing programs to prevent firearm injuries, including emergency gun storage, free gunlocks, and cables.

Table 6a. Healthcare Providers Perspectives Regarding Firearm Use

Perspectives Regarding Firearm Use	All	MD/DO	NP	PA	*p* value
	Number- n (%) unless otherwise noted				
Estimated percent of households in your practice catchment area that have firearms	n=326 Mean (SD) 45.7 (27.5)	n=239 Mean (SD) 44.3 (26.9)	n=69 Mean (SD) 49.8 (29.3)	n=18 Mean (SD) 49.2 (28.3)	0.30
Unable to estimate this number	n=219 40.2%	n=163 40.5%	n=49 23.1%	n=7 28.0%	
*Estimate of the types of firearms owned **	n=589	n=441	n=121	n=27	
Handguns	268 (45.5)	207 (53.1)	51 (42.1)	10 (37.5)	
Rifles	258 (43.8)	199 (45.1)	47 (38.8)	12 (44.4)	--
Shotguns	215 (36.5)	163 (37.0)	42 (34.7)	10 (37.0)	
Don't know	66 (11.2)	51 (11.6)	7 (5.8)	2 (7.4)	
Other	11 (1.9)	8 (1.8)	2 (1.7)	1 (3.7)	
*Estimate of firearm purpose **	n=589	n=441	n=121	n=27	
Hunting	328 (55.7)	245 (55.6)	68 (56.2)	15 (55.6)	
Personal protection	320 (54.3)	238 (54.0)	67 (55.4)	15 (55.6)	
Recreational target shooting	237 (40.2)	182 (41.3)	45 (37.2)	10 (37.0)	--
Gun collecting	166 (28.2)	129 (29.3)	30 (24.8)	7 (25.9)	
Don't know	178 (30.2)	125 (28.3)	45 (37.2)	8 (29.6)	
Other	11 (1.9)	9 (2.0)	1 (0.8)	1 (3.7)	
Awareness of existing programs: *Emergency Gun Storage*	n=486	n=362	n=103	n=21	
Yes, this exists	64 (13.2)	48 (13.3)	15 (14.6)	1 (4.8)	0.56
No, this does not exist	34 (7.0)	24 (6.6)	7 (6.8)	3 (14.3)	
I don't know whether this exists	388 (79.8)	290 (80.1)	81 (78.6)	17 (81.0)	
Awareness of existing programs: Free Child Safe Gun Locks	n=485	n=362	n=102	n=21	
Yes, this exists	138 (28.5)	105 (29.0)	27 (26.5)	6 (28.6)	0.77
No, this does not exist	15 (3.1)	13 (3.6)	2 (2.0)	0 (0)	
I don't know whether this exists	332 (68.5)	244 (67.4)	73 (71.6)	15 (71.4)	
Awareness of existing programs: Tom Sargent Ctr. Free Gun Cable Locks	n=482	n=358	n=103	n=21	
Yes, this exists	44 (9.1)	35 (9.8)	8 (7.8)	1 (4.8)	0.86
No, this does not exist	15 (3.1)	10 (2.8)	4 (3.9)	1 (4.8)	
I don't know whether this exists	423 (87.8)	313 (87.4)	91 (88.3)	19 (90.5)	
Awareness of existing programs: Any Other Protective Measure	n=171	n=120	n=45	n=6	
Yes, this exists	11 (6.4)	9 (7.5)	2 (4.4)	0 (0)	0.17
No, this does not exist	4 (2.3)	2 (1.7)	1 (2.2)	1 (16.7)	
I don't know whether this exists	156 (91.2)	109 (90.8)	42 (93.3)	5 (83.3)	
** Categories not mutually exclusive*					

Table 6b (next page) shows healthcare providers (all categories collapsed) perspectives regarding firearm use and safety according to collapsed categories of rural and urban settings. *Of note is that only about 5.1% of providers in urban settings could make this estimate while 61.5% in rural settings could make this estimate.* Providers perceived that all gun types were more likely to be owned in rural settings and for all purposes (hunting, protection, target shooting and collecting). Awareness of gun safety programs/devises was perceived as more likely in urban settings.

Table 6b. Healthcare Providers Perspectives Regarding Firearm Use According to Rural vs Urban Settings

Perspectives Regarding Firearm Use	All	Rural	Urban	*p* value
	Number- n (%) unless otherwise noted			
Estimated percent of households in your practice catchment area that have firearms Unable to estimate this number	n=317 Mean (SD) 45.9 (27.6) *n (%)* *210 (66.3)*	n=161 Mean (SD) 56.6 (25.9) *n (%)* *62 (38.5)*	n=156 Mean (SD) 34.9 (24.9) *n (%)* *148 (94.9%)*	**<0.001**
*Estimate of the types of firearms owned **	n=492	n=211	n=281	
Handguns	261 (47.0)	141 (66.8)	120 (42.7)	
Rifles	251 (51.0)	141 (66.8)	110 (39.1)	--
Shotguns	208 (42.3)	127 (60.2)	81 (28.8)	
Don't know	172 (35.0)	44 (20.9)	128 (45.6)	
Other	11 (2.2)	6 (2.8)	5 (1.8)	
*Estimate of firearm purpose **	n=492	n=211	n=281	--
Hunting	318 (64.6)	169 (80.1)	149 (53.0)	
Personal protection	312 (63.4)	161 (76.3)	151 (53.7)	
Recreational target shooting	231 (47.0)	131 (62.4)	100 (35.6)	
Gun collecting	162 (32.9)	95 (45.0)	67 (23.8)	
Don't know	135 (27.4)	34 (16.1)	101 (35.9)	
Other	11 (2.2)	5 (2.4)	6 (2.1)	
Awareness of existing programs: *Emergency Gun Storage*	n=471	n=204	n=267	
Yes, this exists	60 (12.7)	20 (9.8)	40 (15.0)	0.005
No, this does not exist	34 (7.2)	23 (11.3)	11 (4.1)	
I don't know whether this exists	377 (80.0)	161 (78.9)	216 (80.9)	
Awareness of existing programs: *Free Child Safe Gun Locks*	n=469	n=205	n=264	
Yes, this exists	133 (28.4)	51 (24.9)	82 (31.1)	0.014
No, this does not exist	14 (3.0)	11 (5.4)	3 (1.1)	
I don't know whether this exists	322 (68.7)	143 (69.8)	179 (67.8)	
Awareness of existing programs: *Tom Sargent Ctr. Free Gun Cable Locks*	n=469	n=203	n=264	
Yes, this exists	43 (9.2)	9 (4.4)	34 (12.9)	0.001
No, this does not exist	15 (3.2)	11 (5.4)	4 (1.5)	
I don't know whether this exists	409 (87.6)	183 (90.1)	226 (85.6)	
Awareness of existing programs: *Any Other Protective Measure*	n=170	n=69	n=101	
Yes, this exists	11 (6.5)	3 (4.3)	8 (7.9)	0.25
No, this does not exist	4 (2.4)	3 (4.3)	1 (1.0)	
I don't know whether this exists	155 (91.2)	63 (91.3)	92 (91.1)	
** Categories not mutually exclusive*				

Table 7 (**next page**) illustrates firearm injury experiences among respondents to the survey. Physicians were statistically more likely than NPs and PAs to have treated firearm injuries, with a broad range across groups in the numbers of injuries treated (5.3-31.8). The majority of injuries were due to crime related shootings (33.6%) with minor accidental shootings at 31% and self-harm at 15.7%.

Table 7. Patient Treatment Firearm Injury Experiences Among Healthcare Providers

Firearm Injury Experience	All	MD/DO	NP	PA	*p* value
	Number- n (% or standard deviation [SD])				
Ever treated firearm injury (yes)	n=495 305 (61.6)	n=372 259 (69.6)	n=103 35 (34.0)	n=20 11 (55.0)	**<0.001**
Mean # of firearm injuries treated (±SD)	n=269 29.3 (56.5)	n=232 31.8 (59.6)	n= 26 16.5 (30.4)	n=11 5.3 (4.5)	0.15
Most Recent Year Firearm Injury Treated Median (Interquartile range in years) Range	n=261 -- 1974-2020	n=226 2017 (9.0) 1974-2019	n=24 2016 (11.0) 2002-2020	n=11 2009 (14.0) 1995-2019	--
Type of most recent firearm injury Minor accidental shooting Life-threatening accidental shooting Crime related shooting Self/harm, suicide attempt Don't know Other	n=274 87 (31.0) 18 (6.6) 92 (33.6) 43 (15.7) 15 (5.5) 21 (7.7)	n=235 72 (30.6) 15 (6.4) 79 (33.6) 39 (16.6) 12 (5.1) 18 (7.7)	n=28 9 (32.1) … 11 (39.3) … … …	n=11 … … … … … …	0.88
… cell contains less than 5 respondents					

Table 8 shows healthcare providers receipt of firearm injury prevention training and their confidence when counseling patients. Just over 40% of respondents reported never receiving any time of firearm injury prevention training, and 70.3% reported that their health professions training did not include training on how to counsel patients on firearm injury prevention. About 52% of respondents reported feeling not at all confident or somewhat confident when counseling young adult or older adult patients about firearm injury prevention, even though nearly 62% have treated firearm injuries. Nearly 34% reported owning a firearm, 5.6% reported being a member of the NRA and about 75% reported it would be very or extremely important to have a federal plan to prevent firearm related violence (**Table 8**). Of the 152 who reported owning a firearm, 112 (73.4%) reported owning a handgun, 100 (65.8%) reported owning a rifle, 94 (61.8% reported owning a shotgun, and 43 (28.3%) reported having an air gun (*Data not shown*). Of those who reported owning a gun, 72 (47.4%) indicated it was for hunting, 92 (60.5%) reported it was for personal protection, 100 (65.8%) reported it was for recreational target shooting, and 33 (21.7%) reported it was for gun collecting (*Data now shown*).

Table 8. Firearm Injury Training and Confidence with Counseling Patients

Firearm Injury Training, Confidence with Counseling patients & Gun Ownership	All	MD/DO	NP	PA	*p* value
	Number- n (%)				
Confidence counseling older adult/family members firearm injury prevention Not at all Confident Somewhat Confident Moderately Confident Very Confident Extremely Confident	n=448 101 (22.5) 139 (31.0) 108 (24.1) 66 (14.7) 34 (7.6)	n=340 75 (22.1) 104 (30.6) 82 (24.1) 54 (15.9) 25 (7.4)	n=88 24 (27.3) 27 (30.7) 18 (20.5) 11 (12.5) 8 (9.1)	n=20 … 8 (40.0) 8 (40.0) … …	0.46
Own a firearm (yes)	n= 448 152 (33.9)	n= 340 116 (34.1)	n= 88 26 (29.5)	n=20 10 (50)	0.22
Member of NRA or other gun organization Yes No Prefer not to answer	n= 499 25 (5.6) 405(91.4) 13 (2.9)	n=338 20 (5.9) 309 (91.4) 9 (2.7)	n= 86 … 79 (91.9) …	n=19 … 17 (89.5) …	0.55

Table 8 Continued. Firearm Injury Training and Confidence with Counseling Patients

Firearm Injury Training, Confidence with Counseling patients & Gun Ownership	All	MD/DO	NP	PA	*p* value
	Number- n (%)				
*Firearm Injury Prevention Training **	n=589	n=441	n=121	n=27	
Yes, as a youth	133 (22.6)	110 (24.9)	16 (13.2)	7 (25.9)	
Yes, as part of military training	28 (4.8)	23 (5.2)	…	…	
Yes, as part of health professions training	47 (8.0)	38 (8.6)	7 (5.8)	…	--
Yes, after my health professions training	64 (10.9)	48 (10.9)	13 (10.7)	…	
No, never received prevention training	237 (40.2)	176 (39.3)	51 (42.1)	10 (37.0)	
Received other training	33 (5.6)	21 (4.8)	11 (9.1)	…	
Health professions training included firearm prevention counseling (yes)	n=441 131 (29.7)	n=336 99 (29.5)	n=86 27 (31.4)	n=19 5 (26.3)	0.89
Includes firearm related issues as a topic in professional reading (yes)	n=589 452 (76.7)	n=441 334 (78.0%	n=121 88 (72.7)	n=27 20 (74.1)	
Confidence counseling young adults/family members firearm injury prevention	n=451	n=343	n=88	n=20	
Not at all Confident	104 (23.1)	77 (22.4)	25 (28.4)	…	
Somewhat Confident	132 (29.3)	102 (29.7)	22 (25.0)	8 (40.0)	0.32
Moderately Confident	112 (24.8)	83 (24.2)	21 (23.9)	8 (40.0)	
Very Confident	69 (15.3)	57 (16.6)	11 (12.5)	…	
Extremely Confident	34 (7.5)	24 (7.0)	9 (10.2)	…	
Importance of federal plan to prevent firearm related violence	n= 444	n=338	n=87	n=19	
Not at all important	42 (9.5)	36 (10.7)	5 (5.7)	…	
Somewhat important	38 (8.6)	30 (8.9)	6 (6.9)	…	0.87
Moderately Important	32 (7.2)	24 (7.1)	6 (6.9)	…	
Very important	91 (20.5)	68 (20.1)	18 (20.7)	…	
Extremely important	241 (54.3)	180 (53.3)	52 (59.8)	9 (47.4)	
* Categories are not mutually exclusive … cell contains less than 5 respondents					

Table 9 illustrates the firearm injury assessment behaviors that healthcare providers reported using. Most (between 83% and 95%) reported doing not assessing every adolescent or adult patient they see about firearm injury prevention. Nearly 44% indicated that a known mental health issue, issues related to drugs or alcohol in the home (26.5%), or having children in the home (25.6%) are criteria they use to determine if patient counseling is needed for firearm injury prevention. On average, respondents reported that about 27% of their patients would benefit from firearm injury prevention, though only about 20% actually reported counseling these patients. Importantly, greater than 48% think counseling is very important or extremely important.

Table 9. Firearm Injury Prevention Assessment Behaviors According to Type of Healthcare Provider

Firearm Injury Prevention Assessment Behaviors	All	MD/DO	NP	PA	*p* value
	Number- n (%)				
% Patients/ family members you assessed who you think would benefit firearm injury prevention (yes)	n=360 26.8 (*32.0*)	n= 275 25.7 (*31.9*)	n= 68 31.7 (*34.5*)	n=17 24.7 (*23.6*)	0.38
% Patients/ family members you council about injury firearm prevention (yes)	n=360 19.8 (27.1)	n= 276 17.4 (25.13)	n=67 30.4 (33.3)	n=17 17.5 (20.9)	**0.002**
Importance of counseling patients about firearm injury prevention	n=451	n=344	n=87	n=20	
Not at all Important	27 (6.0)	25 (7.3)	…	…	
Somewhat Important	96 (21.3)	77 (22.4)	16 (18.4)	…	0.19
Moderately Important	109 (24.2)	86 (25.0)	17 (19.5)	6 (30.0)	
Very Important	128 (28.4)	87 (25.3)	34 (39.2)	7 (35.0)	
Extremely Important	91 (20.2)	69 (20.1)	18 (20.7)	…	
* Categories are not mutually exclusive. … cell contains less than 5 respondents					

Table 9 Continued. Firearm Injury Prevention Assessment Behaviors According to Type of Healthcare Provider

Firearm Injury Prevention Assessment Behaviors	All	MD/DO	NP	PA	*p* value
	Number- n (%)				
Assesses every family member, adolescent or adult patient for firearm injury prevention (yes)	n= 451 51 (11.3)	n= 344 35 (10.2)	n=87 15 (17.2)	n=20 1 (5.0)	0.12
*Criteria to determine if patient counseling is needed for firearm injury prevention**	n=589	n=441	n=121	n=27	
They are a gun owner or have access to guns	154 (26.1)	111 (25.2)	37 (30.6)	6 (22,.2)	
They have mental health issues, including depression	256 (43.5)	196 (44.4)	46 (38.0)	14 (51.9)	
There are issues related to drugs or alcohol in the home	156 (26.5)	114 (26.1)	32 (26.4)	9 (33.3)	--
There are criminal/gang related issues in the home	77 (13.1)	56 (12.7)	17 (14.0)	…	
There are children in the home	151 (25.6)	107 (24.3)	37 (30.6)	7 (25.9)	
I never assess firearm prevention practices	135 (22.9)	107 (24.3)	23 (19.0)	7 (18.5)	
Other	40 (6.8)	30 (6.8)	9 (7.4)	…	

Table 10 outlines the issues that prevent healthcare providers from counseling patients about firearm injuries and possible strategies to improve this. Respondents reported that lack of time (26.3%), patients not being open to counseling (17.8%), and forgetting to do it (21.1) are the main issues that prevent this from occurring. Many respondents thought (46.7%) that developing a practice-based protocol to address firearm injury prevention with patients would be helpful to them.

Table 10. Issues that Prevent Healthcare Providers from Counseling Patients about Firearm injuries & Possible Strategies to Improve This

Issues that Prevent Providers from Counseling Patients About Firearm Injury Prevention & Possible Strategies	All	MD/DO	NP	PA	*
	Number- n (%)				
Most important issue that prevents counseling patients and family members about firearm injury prevention:	n= 589	n= 441	n=121	n=27	
No Time	155 (26.3)	128 (29.0)	20 (16.5)	7 (25.9)	
Timing not right (e.g., Patients/Families are too stressed from the injury for counseling)	81 (13.8)	64 (14.5)	12 (9.9)	5 (18.5)	
I am not sure how to do it	101 (17.2)	76 (17.1)	19 (15.7)	6 (22.2)	
I don't think counseling is effective	35 (5.9)	29 (6.6)	5 (4.1)	…	--
My patients already have the information	51 (8.7)	35 (7.9)	12 (9.9)	…	
My patients are not open to this	105 (17.8)	81 (18.4)	21 (17.4)	…	
Counseling on this topic is not my responsibility	44 (7.5)	40 (9.1)	…	…	
I forget to do it	124 (21.1)	90 (20.4)	27 (22.3)	7 (25.9)	
I am hesitant to address it because the topic is so politically charged	86 (14.6)	66 (15.0)	15 (12.4)	5 (18.5)	
What would help you address firearm injury prevention when interacting with patients?	n=589	n=441	n=121	n=27	
Prompt in the electronic health record	132 (22.4)	90 (20.4)	35 (28.9)	7 (25.9)	--
Getting help, as directed, from my office staff	68 (11.5)	53 (12.0)	12 (9.9)	…	
Developing a practice-based protocol to address firearm injury prevention	275 (46.7)	195 (44.2)	65 (53.7)	15 (55.6)	
* Respondents checked all that apply … cell contains less than 5 respondents					

Table 11 illustrates factors that respondents think contribute to gun violence and educational content that they think would help them do a better job addressing firearm injury prevention. Socioeconomic factors (64.9%), mental illness (68.6%), gang related violence (63%), and drug and alcohol use (71.7%) were all ranked highly. In terms of educational content area, counseling/educating high-risk patients/families on gun safety to help reduce their risk was most commonly mentioned, and webinar or online programs (47.4%) were favored for educational processes.

Table 11. Factors that Contribute to Gun Violence, and Preferred Educational Programming

Factors that Contribute to Gun Violence and Preferred Educational Programming	All	MD/DO	NP	PA	*
	Number- n (%)				
What factors contribute to gun violence?	n= 589	n= 441	n=121	n=27	
Socioeconomic factors	382 (64.9)	295 (66.9)	72 (59.5)	15 (55.6)	
Mental illness	404 (68.6)	309 (70.1)	78 (64.5)	17 (63.0)	
Gang related violence	371 (63.0)	285 (64.6)	69 (57.0)	17 (63.0)	
Drug and alcohol use	422 (71.7)	321 (72.8)	84 (69.4)	17 (63.0)	
What educational content areas would help you address firearm injury prevention?	n=589	n=441	n=121	n=27	
How to identify at risk patients and families	269 (45.7)	197 (44.7)	59 (48.8)	13 (48.1)	
How to counsel/educate high-risk patients/families on gun safety to help reduce their risk.	296 (50.3)	215 (48.8)	69 (57.0)	12 (44.4)	
Specific information on laws and restrictions on gun ownership	278 (47.2)	210 (47.6)	56 (46.3)	12 (44.4)	
Specific information on firearm handling and storage	256 (43.5)	189 (42.9)	55 (45.5)	12 (44.4)	
Having a better understanding of firearm owner culture and how best to approach patients on this topic	245 (41.6)	179 (40.6)	57 (47.1)	9 (33.3)	
What types of educational approaches work best for you?	n=589	n=441	n=121	n=27	
In person sessions with guest speakers	235 (39.9)	163 (37.0)	57 (47.1)	15 (55.6)	
Webinar/Online program	279 (47.4)	207 (46.9)	60 (49.6)	12 (44.4)	
Other	45 (7.6)	40 (9.1)	…	…	

* Respondents checked all that apply
… cell contains less than 5 respondents

Table 12 (next page) presents other insights respondents had regarding firearm injury prevention preparedness, including that only about 10% distribute written materials on firearm prevention. About 40% believe that the lack of firearm injury prevention moderately or completely affects their patients and families in negative ways and nearly 60% thought this affected their communities in negative ways. Nearly 70% of respondents do not feel well prepared to address firearm injury prevention, indicating more work is needed in this area.

Table 12. Other Insights Respondents had about Firearm Injury Prevention Preparedness

Other Insights about Firearm Injury Prevention Preparedness	All	MD/DO	NP	PA	*p* value
	Number- n (%)				
Do you or your staff distribute written materials on firearm injury prevention? (yes)	n=450 46 (10.2)	n=343 38 (11.1)	n=87 6 (6.9)	n=20 2 (10.0)	0.52
To what extent …					
… do you believe the lack of firearm injury prevention negatively affects your patients and their families?	n=444	n=338	n=86	n=20	
Not at all	77 (17.3)	64 (18.9)	12 (14.0)	…	
Somewhat	193 (43.5)	141 (41.7)	40 (46.5)	12 (60.0)	0.18
Moderately	102 (23.0)	74 (21.9)	25 (29.1)	…	
Completely	72 (16.2)	59 (17.5)	9 (10.5)	…	
… do you believe the lack of firearm injury prevention negatively affects your community?	n=447	n=340	n=87	n=20	
Not at all	44 (9.8)	37 (10.9)	6 (6.9)	…	
Somewhat	151 (33.8)	112 (32.9)	30 (34.6)	9 (45.0)	0.79
Moderately	133 (29.8)	99 (29.1)	29 (33.3)	5 (25.0)	
Completely	119 (26.6)	92 (27.1)	22 (25.3)	5 (25.0)	
…are you well prepared to address firearm injury prevention?	n=447	n=341	n=86	n=20	
Not at all	145 (32.4)	110 (32.3)	30 (34.9)	5 (25.0)	
Somewhat	163 (36.5)	119 (34.9)	33 (38.4)	11 (55.0)	0.60
Moderately	96 (21.5)	78 (22.9)	15 (17.4)	…	
Completely	43 (9.6)	34 (10.0)	8 (9.3)	…	
…are you well informed about firearm injury prevention programs?	n=446	n=340	n=86	n=20	
Not at all	278 (62.3)	210 (61.8)	57 (66.3)	11 (55.0)	
Somewhat	108 (24.2)	82 (24.1)	19 (22.1)	7 (35.0)	0.86
Moderately	52 (11.7)	42 (12.4)	8 (9.3)	…	
Completely	8 (1.8)	6 (1.8)	…	…	
…are you well informed about laws/restrictions on gun ownership and firearm types?	n=447	n=341	n=86	n=20	
Not at all	209 (46.8)	150 (44.0)	50 (58.1)	9 (45.0)	
Somewhat	129 (28.9)	100 (29.3)	21 (24.4)	8 (40.0)	0.19
Moderately	67 (15.0)	58 (17.0)	8 (9.3)	…	
Completely	42 (9.4)	33 (9.7)	7 (8.1)	…	
… cell contains less than 5 respondents					

Summary and Recommendations

This survey of healthcare providers included 589 Oregon respondents, one of the larger such surveys in the U.S. to date. However, the response rate was low (10.6%) despite multiple contacts. The results are useful in describing limited prior training for firearm safety, if any, among health care providers, which if they had received could help them counsel their patients. The majority of healthcare providers did not assess whether their patients or families would benefit from firearm injury prevention, yet expressed interest in having these skills. Injury prevention and health promotion are traditional parts of provider-patient visit conversations. Most respondents thought that developing a practice-based protocol to address firearm injury prevention with patients would be helpful to them: examples are electronic health records, or flow sheets. To achieve a reduction in firearm injury based on healthcare providers, the state could develop an Oregon-centric public health program of provider training and other resources (e.g., gunlocks and firearm safes). Based on these key findings, we, the OHSU–PSU Gun Violence as a Public Health Issue Advisory Committee (Members listed in **Appendix V**) make the following recommendations.

Recommendations

1) Initiate a plan to add biannual survey modules that monitor firearm safety based on the existing Centers for Disease Control and Prevention (CDC) Oregon Healthy Teens, and Behavioral Risk Factor Surveillance System (BRFSS) Surveys.
2) Develop and disseminate Oregon-centric firearm safety counseling programs for healthcare providers.
3) Develop and disseminate tailored local media campaigns with community partners to address knowledge gaps and create communities informed about and committed to firearm safety.
4) Develop and disseminate a toolbox of practice-based protocols and other healthcare setting specific tools that will help to overcome logistical barriers to firearm counseling and provide access to low-cost firearm security equipment.
5) Monitor healthcare provider knowledge and emerging education needs in Oregon.
6) Foster the identification of a public health (OHA) practice "champion" for firearm safety to implement population surveillance, and better educational and counseling strategies in healthcare settings

APPENDIX A – Study Survey

Study ID: ☐☐☐☐☐

The purpose of this survey is to understand your practice, your experiences with patients who have experienced firearm violence, personal experience with firearms, and your thoughts about how firearm safety affects both your practice and your community. There are three sections to this survey and it will take about 10 minutes to complete. ***We very much appreciate your contribution to this important work!!***

I. Information About You, Your Practice and the Community Where your Practice is Located

1. What is your current age in years?_____Years

2. What is your current gender identity?
   a. Male
   b. Female
   c. Trans male/Trans man
   d. Trans female/Trans woman
   e. Genderqueer/Gender non-conforming
   f. Prefer to describe: _____
   g. Prefer not to answer

3. What is your ethnicity?
   a. Hispanic or Latino
   b. Non-Hispanic or Non-Latino

4. What is your race identity?
   a. White
   b. Black or African American
   c. Asian/Pacific Islander
   d. American Indian/Alaska Native
   e. Two or more races: (Please describe:_____)
   f. Other (Please describe:_____)
   g. Prefer not to answer

5. Do you have children still living in your home? a. Yes b. No

6. What type of clinical training did you receive?
   a. MD
   b. DO
   c. Nurse Practitioner
   d. Physician Assistant
   e. Other (Please describe:_____)

7. If you are an MD or DO, in what year did you *fully* complete your training (e.g., complete residency, fellowship(s)? _____
   Year

8. If you are a nurse practitioner or physician assistant, in what year did you complete your training: _____

   ___ ___
   Year

9. What is your specialty area?
   a. Family Medicine
   b. General Internal Medicine
   c. General Pediatrics
   d. Sub-specialty (Please describe:_____)
   e. Other (Please describe:_____)

10. Do you provide direct patient care? a. Yes b. No **->** (If **No**, Skip to Question **20**).

11. If **Yes**, do you:
   a. See both inpatients and outpatients
   b. See inpatients only
   c. See outpatients only
   d. Other (Please describe:_____)

12. If you see patients in an outpatient setting, how many half days of clinic do you have per week?
   a. _____ Half day clinic sessions **->**How many patients do you typically see per half day _____
   b. Prefer to describe: _____

13. What is your clinical practice's type of ownership (Please circle ***one response***)?
   a. Private Partnership
   b. Non-University Hospital or Health System
   c. Community Health Center
   d. University Hospital/School of Medicine
   e. Other (Please describe:_____)

14. Which of the following types of professionals are part of your clinical team caring for patients at your practice/hospital (Please circle ***all that apply***):
   a. Family Physicians
   b. General Pediatricians
   c. General Internists
   d. OB/GYN Physicians
   e. Dentists
   f. Nurse practitioners
   g. Physician Assistants
   h. Behavioral Health Specialists
   i. Social Workers
   j. Pharmacy

k. Health Educators
l. Care or Case Managers
m. Nurses (e.g., RN, LPN)
n. Medical Assistants
o. Other (Please describe:_____)

15. Please estimate the patient payment methods in your setting (*ENTER "0" if the answer is none*. Total should equal 100%):

Private health insurance ____%

Medicare ____%

Medicaid ____%

Other federal (e.g., Department of Veterans' Affairs) ____%

Uninsured ____%

Other(Please describe:_____) ____%

TOTAL = 100%

☐ *Check here if you feel completely unable to estimate payment methods in your setting*

16. Please estimate your patient population's ethnicity **(total should equal 100%)**:
    a. Hispanic or Latino _____%
    b. Non-Hispanic or Non-Latino _____%

TOTAL = 100%

17. Patient race (***ENTER "0" if the answer is none***)
    a. White ____%
    b. Black or African American ____%
    c. Asian/Pacific Islander ____%
    d. American Indian/Alaska Native_____%
    e. Two or more races ____% (Please describe:_____)
    f. Other ____% (Please describe:_____)

TOTAL = 100%

18. How large is the community in which you practice?
    a. Village (<1,000)
    b. Small town (1,000-20,000)
    c. Large town (20,000 to 100,000)
    d. Small city (100,000 and 300,000)
    e. Large city (>300,000)

19. How long have you been in your current practice/hospital setting? _____Years

II. Information About Firearms in Your Community

20. Please estimate the percent of the households in your practice catchment that have firearms?
    a. _____%
    b. Don't know

21. What is your best estimate of the type(s) of firearms most households have (Please circle ***all that apply***)?
    a. Handguns
    b. Long guns (rifles)
    c. Shotguns
    d. Air guns
    e. Don't know
    f. Other (Please describe:_____)

22. Please estimate the purpose(s) that those households have firearms (Please circle ***all that apply***)?
    a. Hunting
    b. Personal protection
    c. Recreational target shooting
    d. Gun collecting
    e. Don't know
    f. Other (Please describe:_____)

23. Are you aware that any of the following programs exist in your community to help provide preventive measures to protect your patients from firearm injuries:

Protective Measure	Yes, this exists	No, this does not exist	I don't know whether this exists
Emergency gun storage			
Protect Childsafe Free Gun Locks			
Extreme Risk Protection Orders			
Tom Sargent Safety Center free gun cable locks and reduced gun safety supplies			
Other (Please Describe:			

III. Information About Your Experiences with Firearms and Firearm Safety

24. Have you ever treated a patient with a firearm injury? a. Yes b. No **->**If No, skip to Question **28**

25. If **Yes**, how many times have you treated one or more patients with a firearm injury? _
(# of times)

26. When was the most recent event where you treated a patient with a firearm injury?_____/_____
Month/ Year

27. How old was the patient in this event?_____Years____Month

28. Was this firearm injury:
    a. A minor accidental shooting
    b. A life-threatening accidental shooting
    c. A crime related shooting
    d. Done for self/harm or suicide attempt
    e. Don't know
    f. Other (Please describe:_____)

29. Have you ever received training in firearm injury prevention (e.g., possession, handling, storage, risks, local training)? Please circle ***all that apply***.
    a. Yes, as a youth
    b. Yes, as part of my military training
    c. Yes, during my health professions training
    d. Yes, I took a training program after I completed my health professions training
    e. I never received firearm injury prevention training
    f. Other training (Please describe:_____)

30. Did your health professions training program include counseling patients about firearm injury prevention?
    a. Yes b. No

31. Have you included firearm related issues as a topic in your professional reading? a. Yes b. No

32. How confident do you feel **counseling** your *adolescent/young adult patients* or family members about firearm injury prevention?

Not at all Confident	Somewhat Confident	Moderately Confident	Very Confident	Extremely Confident
1	2	3	4	5

33. How confident do you feel **counseling** your *older adult patients* or family members about firearm injury prevention?

Not at all Confident	Somewhat Confident	Moderately Confident	Very Confident	Extremely Confident
1	2	3	4	5

34. Do you **assess** every family member, adolescent patient or adult patient for firearm injury prevention?

    a. Yes b. No

35. What criteria do you use to determine if you need to **assess** firearm injury prevention practices (Please select all that apply)?
    a. I know they are a gun owner or have access to guns
    b. I know there are mental health issues, including depression
    c. I know there are issues related to drugs or alcohol addiction in the home
    d. I know there are criminal or gang related issues in the home
    e. I know there are children in the home
    f. I never assess patient's firearm injury prevention practices
    g. Other (Please describe:_____)

36. What percent of your patients or family members do you ***assess*** *to determine whether they may benefit from counselling* about firearm injury prevention (e.g., ask about firearm possession and/or storage, risks and training)? ***Place an "X" on the line below to indicate your response***

|----------|----------|----------|----------|

0% 25% 50% 75% 100%

37. What percent of your patients or family members do you council about firearm injury prevention? (e.g., council about firearm storage, risks and training)? ***Place an "X" on the line below to indicate your response***

|----------|----------|----------|----------|

0% 25% 50% 75% 100%

38. What is the most important issue that prevents you from **counseling** patients or their family members about firearm injury prevention (Please circle ***all that apply***)?
    a. I don't have time
    b. Timing is not right (e.g., patients/families are too stressed from the injury for counseling)
    c. I'm not sure how to do it
    d. I don't think counseling is effective
    e. My patients already have this information
    f. My patients are not open to it
    g. I don't think counseling on firearm injury prevention is my responsibility
    h. I don't remember to do it
    i. I am concerned that by counseling patients, I am increasing my risk of malpractice or increases in malpractice insurance
    j. I am hesitant to address it because the topic is very politically charged
    k. Other (Please describe:_____)

39. What would help you address firearm injury prevention when interacting with patients? (Please circle ***all that apply***)?
    a. Prompt in the EHR
    b. Getting help, as directed, from my office staff
    c. Developing a practice-based protocol to address firearm injury prevention with our patients
    d. Other (Please describe:_____)

40. In your opinion, how important is it for health professionals to **counsel** patients about firearm injury prevention?

Not at all Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
1	2	3	4	5

41. Do you or your staff distribute or make available written materials on firearm injury prevention?

    a. Yes b. No

42. Please select **one response** for each of the following:

To what extent do you believe:	Not at all	Somewhat	Moderately	Completely
That the lack of firearm injury prevention negatively affects your patients and their families	1	2	3	4
That the lack of firearm injury prevention negatively affects your community	1	2	3	4
You are well prepared to address firearm injury prevention	1	2	3	4
You are well informed about firearm injury prevention programs	1	2	3	4
You are well informed about laws and restrictions on gun ownership and firearm types	1	2	3	4

43. What factors do you think contribute to firearm related violence (Please circle ***all that apply***)?
    a. Socioeconomic factors
    b. Mental illness
    c. Gang related violence
    d. Drug and alcohol issues
    e. Other (Please describe:_____)

44. What educational content areas do you think would help you do a better job addressing firearm injury prevention (Please circle ***all that apply***)?
    a. How to identify at risk patients/families
    b. How to counsel/educate at risk patients/families on gun safety to reduce their risk
    c. Specific information on laws and restrictions on firearm ownership
    d. Specific information on firearm handling and storage

e. Having a better understanding of firearm owner culture and how best to approach patients on this topic
f. Other (Please describe:_____)

45. What types of educational approaches work best for you (Please circle ***all that apply***)?
    a. In person sessions with guest speaker(s)
    b. Webinar/ Online programs
    c. Other (Please describe:_____)
    d. Do you own a firearm? a. Yes b. No **->**If No, skip to Question **48**

46. What type(s) of firearms do you own (Please circle ***all that apply***)?
    a. Handguns
    b. Long guns (rifles)
    c. Shotguns
    d. Air guns
    e. Other (Please describe:_____)

47. For what purpose(s) do you own firearms (Please circle ***all that apply***)?
    a. Hunting
    b. Personal protection
    c. Recreational target shooting
    d. Gun collecting
    e. Other (Please describe:_____)

48. Are you a member of the National Rifle Association or another gun association?

    a. Yes b. No c. Prefer not to answer

49. Are you a member of any gun control organization (e.g., The Brady Campaign, The Coalition to Stop Gun Violence)?

    a. Yes b. No c. Prefer not to answer

50. How important is it to you, personally, for the United States to agree upon a federal plan to prevent firearm-related violence?

Not at all Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
1	2	3	4	5

51. What interventions do you think would be more effective in preventing firearm violence?

52. What other thoughts would you like to share about firearm safety?

Thank you for completing this survey!

Physician and Other Healthcare Provider Perspectives on Firearm Safety and Intervention

Paper prepared as part of the OHSU Firearm Safety Study

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INTRODUCTION

Suicide and homicide are critical and increasing public health issues in the United States (US) and in Oregon. In Oregon, the majority of firearm deaths are suicides followed by homicides; with males more than six times more likely than females to die from a firearm injury (Shen, 2016. On average, at least one Oregonian dies from a firearm injury every day (Shen, 2016).Researchers recognize that firearm fatalities are preventable – and yet despite national efforts to reduce the rates of suicide, there has been no evidence of an overall decrease in suicide deaths or suicide attempts in the US. In fact, from 1999-2014, deaths by suicide in the US have increased steadily in both men and women. In 2017 more than 47,000 people died by suicide, at a rate of 14.5 per 100,000 people. In Oregon, this rate is higher, with 19.9 suicide deaths per 100,000 people (Drapeau & McIntosh 2018). From 2008 – 2017 the homicide rate was 9.6 per 100,000, with death rates peaking in 2015 (Oregon Violent Death Reporting System, 2020).

These concerning numbers have given rise to many calls for healthcare providers, public health specialists, and state and federal governmental agencies to respond to a growing crisis. This current research was conducted to understand the role and current capacity of physicians and other healthcare providers to respond to both potential and actual violence that results from firearms.

This research is situated in a cross section of the literature that demonstrates three conditions are present in suicide and suicide prevention. First, that means restriction, or "the limitation of access to lethal means used for suicide (Yip et al. 2012)",is an empirically tested method of preventing deaths by suicide (WHO 2014; Florentine & Crane 2010). Second, firearms account for over 50% of deaths by suicide in the United States. That means that safety measures specific to firearms may reduce suicide by firearms. The protective means include safe storage(firearms are unloaded, in a secure location such as a gun safe, with cable or trigger locks, with ammunition stored separately), or having someone temporarily hold the firearms outside of the home during times of elevated risk are frequently not implemented in Oregon (Marino, 2016).Third, 64% of those who die by suicide in the US have had contact with their primary care provider within a year of death (Ahmedani, et al 2014) and 45% within a month of death (Luoma, et al, 2002).Because of these three conditions, and because broadly speaking firearm violence is a public health issue, the Oregon Health & Science University, in collaboration with researchers at Oregon State University-Cascades and with support from the Oregon State Legislature, conducted a set of focus groups on understanding the role, challenges, and opportunities physicians and other healthcare providers (Physician Assistants, Nurse Practitioners) may experience when intervening and preventing violence linked to firearms. (For the purposes of this report, when the term "provider" is used, it includes all three provider types).

Drs. Marino and Keys have worked previously with firearm owners trying to understand if they would remove firearms from a home when there was an increased chance of suicidal ideation or severe depression. They also investigated if they would feel comfortable talking with their primary care physicians and/or other healthcare providers about firearms as a safety issue (Marino et. al 2016; Marino et. al 2017; Wolsko, Marino, & Keys, 2019). In that work, the authors found firearm owners were more likely to report they would remove firearms as a suicide prevention strategy if presented with messages and information that were culturally aligned with their worldview. Similarly, the more culturally aligned messages were with firearm owners, the more likely they were to report feeling comfortable speaking with a provider about suicide.

This current research is a mirror investigation of those same issues; however our approach was less focused on suicide, exploring more broadly experiences with firearms and firearm violence in general. Instead of working

with firearm owners (though some of our focus group members did own firearms), we worked with physicians and other healthcare providers to gauge their experiences in talking about firearms with patients. We asked about their patient population, their experiences with conversations around firearm safety, the training they had had in order to carry out these conversations, and the issues and challenges they faced in counseling patients on firearm violence as a health issue. Our findings suggest the following:

1) That providers believe firearm ownership is prevalent among their patient populations;
2) That violence by firearms is something that they see, treat, and are concerned with;
3) That there are few data reports to understand their role or impact they might have if they intervene;
4) That conversations around firearm ownership as a public safety issue are challenging, and can create distrust between providers and patients; and
5) That there is no standard protocol for intervention, so healthcare providers are "making it up as they go along."

METHODS

To complete this research, we held four focus groups between July 10, 2019 and December 16, 2019. Focus groups were led by Dr. Elizabeth Marino, associate professor of anthropology at OSU-Cascades, Dr. Susan Keys, a retired associate professor of public health at OSU-Cascades, Dr. Brian Gibbs, a public health and diversity, equity, and inclusion specialist, and Dr. Elena Andresen, epidemiologist and provost at OHSU. Project Manager Holly Yoo recruited focus group participants and provided logistical help. Two of the focus groups took place in Portland and two were in rural communities in Oregon. Focus groups lasted between 56 and 70 minutes. We provided a meal for participants, but they were otherwise not paid. The interview guide was semi-structured, meaning most of the questions were asked in the same order; however variation existed in phrasing and in interviewer responses to the focus group participants. Interviews were recorded, transcribed, and uploaded into MAXQDA. We iteratively coded transcripts to reveal a set of eleven primary codes. These codes were further broken down into categories when necessary. For confidentiality, excerpts reported here have identifying information de-identified noted by [brackets]. We present our findings below.

PROVIDER SAMPLE

Twenty-two providers attended one of four focus groups during Fall of 2019. This was a convenience sample: providers were recruited from a state physician/physician assistant association, OHSU provider groups and their community contacts, and in two rural areas, they were recruited by community contacts from OHSU rural campus staff. Participants completed a brief survey about themselves and their practices. Table 1 (Appendix) presents participant characteristics. In general, the majority of participants had been in practice for between 11 and 30 years, were white, and were equally divided by rural or urban practice locations. The majority of providers reported they worked in primary care/family medicine or internal medicine. Most practices were composed of primarily white patients (54.5%) or both white and patients of color (36.4%).

FINDINGS

Our most critical finding is that these healthcare providers interact with patients for whom both the potential and actual effects of firearm violence are real. All participants had experience with some type of actual or

potential firearm violence, and in some cases expressed fear that a patient would use a firearm and die by suicide. Most providers did not have training for how to engage with patients about firearm safety and the potential for harm. Most providers were not aware of empirical data that demonstrated best practices. Most rural providers assumed that the majority of their patient population had firearms and many believed that a significant percentage of those firearm owners did not have a firearm lock or keep the firearm in a safe, with the ammunition in a different location (Marino et al., 2017; Tejera& Andresen, 2019). Most providers had discussed the risks of firearms with some patients, but were doing so on an ad hoc basis, according to their own instinct and experience, and were not using evidence-based protocols.

A. Patient population

In both urban and rural focus groups, healthcare providers indicated that they had diverse patient populations. Both types of groups identified rural firearm owners as a portion of their population base. Because trauma patients often end up in urban care settings, the rural firearm owning population was a concern for healthcare professionals in both Portland and in rural settings. In multiple interviews, providers contrasted the rural firearm owning population in Oregon to urban firearm violence they had experienced outside of the state. No urban violence in Oregon was mentioned by providers.

In our rural focus groups, there was significantly more emphasis on the prevalence of firearms among the patient population. Multiple participants said things such as, "It's so normal… it's more normal to think that people do have them than don't" or, "most people [have guns]. And ..they're not kept locked. They're really available in many places, you know. One person I know carries one under the seat of the car, loaded."Even for pediatricians or mental health specialists working primarily with high school aged students there were comments such as: "All of my teenagers have access to guns." Some rural providers also told us that firearm safety did not mean the same thing to all of their patients. For some, it meant storing firearms in a firearm safe. For others, it meant having firearms on hand to deal with an intruder or other risk.

One of our participants said:

> "I mean my duck hunting gun is in my brother-in-law's locker and the ammunition is someplace else. It takes a significant time to put together everything when we're going to go duck hunting… But I think for a large number of people, there's a nine-millimeter under their table or next to them, and it's open and there's no lock."

These comments indicated to us that rural healthcare providers were critically aware that firearms were ubiquitous among their rural patients. Rural health physicians were also more likely than providers working in urban areas to discuss patient mental health concerns as a constant part of their professional life – though we note this is probably not indicative of less mental health issues in urban areas. In one interview, a focus group participant made the claim, "A school shooting in [name]is inevitable." One participant noted when the question of mental health arose, that mental health needs of patients had "blown [him] away; how much mental health experience [he's] gained here."

One patient population that came up repeatedly, and was surprising to researchers, is the concern among providers for elderly patients who were also firearm owners. Providers told us that they had multiple elderly patients who maintained firearms and they were concerned about their safety. As one participant said, "the depressed elderly person who has some cognitive dysfunction makes me the most nervous." A particularly salient example of this was the observation by a hospice provider that many end-of-life patients had firearms and that

firearm safety was a concern among hospice nurses, doctors, and social workers – both for their patients and for providers who provide support in firearm owners' homes.

B. Experiences of Firearms and Firearm Injury

Throughout our sample, healthcare providers had significant exposure to the outcomes of firearm violence. In many cases, participants reported their experiences with firearm death and injury in their personal lives. In most cases, however, participants were reporting their exposure to patients they worried might use a firearm to take their own life, or someone else's. Surgeons had treated firearm wounds. Providers had to decide whether to bring up owning a firearm with a patient who demonstrated suicidal tendencies. Multiple participants had experience with a client dying by suicide after they had seen them. All participants in our focus groups had experience with firearm violence among their patients.

C. Risk of Firearm Violence to Providers

One thing we did not expect from providers was the number of times they reported experiences with firearms in which violence erupted within their practice sites (not necessarily in Oregon). For example, one participant told the following story.

> "I've been directly impacted by the gun violence issues. I trained in a large urban area… My training was in what we described as a "knife and firearm club," where most of what my emergency and surgical training was all about, was knife and gun violence. I did an ER rotation in the emergency room. and, the week that I left that rotation and moved on, a physician sat in the seat that I was sitting in and was shot by a patient and killed."

Some providers discussed patients who shot themselves in the ER; others said that they instructed students in medical schools who were stalked during training and had to find alternate teaching arrangements to provide safety to these students. Others indicated they had encountered patients with concealed firearms while in the exam room. These experiences suggested to us that healthcare facilities and academic health centers were not only places where violence is treated – but potentially places where firearm violence emerges. Research shows that healthcare workers are already four times as likely as other occupational groups to experience workplace violence (Bland et. al. 2015). Given the stories shared during these focus groups, it is important to know the percentage of healthcare providers who have been exposed to firearm violence, or the risk of firearm violence, in their workplace in Oregon. The accompanying report based on Oregon healthcare providers provides these data.

D. Categories of Experience

There were a few categories of experience that were salient and distinct in the data set that may provide useful contrasts in health care provider experience, and which have potential for intervention. We note here that our sample was limited – each category of experience was reported on by as few as one or two respondents. However, it would be useful to create a matrix of categories of patient/provider interactions, and the following results could be the beginning of such a matrix.

- *Surgeons treating firearm wounds*

Surgeons interact with patients who have experienced an episode of traumatic firearm injury. These experiences may include an accidental discharge, in which case a participant reported that patients were mostly

embarrassed. It can also be an interaction with a victim of firearm violence, and/or a perpetrator. Surgeons also reported that in their experiences outside of Oregon, tracing bullets was important to people who were shot – we presume to trace the firearm and/or shooter. These acute scenarios may provide opportunity to prevent continued firearm violence, but are different from other preventative opportunities, which we highlight below. In these cases, surgeons report that social workers interact with patients for other kinds of interventions such as alcohol intervention. It was unclear to surgeons whether this was an optimal, or even possible opportunity for social workers to have a conversation about firearms. Surgeons also reported they interact with family members of firearm victims.

- *Pediatrics*

Pediatric screenings include questions about firearms in the house. Because of that, these providers are more accustomed to having this conversation with patients than non-pediatric providers. The conversations can be either "awkward" as one provider put it, or successful, dependent on the provider and the patient. There were also reports on adolescent patients who were suicidal; and concerns about adolescents who have mental health issues and access to firearms. In all of these cases, healthcare providers typically discussed firearms and firearm violence with parents.

- *Suicidal ideation or Other Mental Health Conditions in Adults*

As one participant stated, "it's clear to me now that any conversations I've had about firearms has really been in conjunction with mental health." Another said, when asked when they bring up firearms, "I probably… don't do it enough, but it's when depression makes me think of suicidality." In many cases, physicians and other providers discussed their experiences with talking about firearms as a moment when a patient expresses suicidal ideation or other mental health issues and they worry the patient might cause harm to themselves or someone else. In these cases, primary care physicians, physician assistants, nurse practitioners, or nurses decide whether they will involve outside help. As one healthcare provider put it, "we usually involve psychiatry service and case managers and so then the firearm safety piece of it is really secondary or tertiary. So, we really usually never get to that part of the conversation."

Other providers did "get to that part of the conversation" and directly talked with their patients about firearm safety. We note here particularly providers who were affiliated with the Department of Veterans Affairs (VA) healthcare system had more experience and referred to a more systematic and trained approach to promoting firearm safety and suicide intervention with people they assumed had firearms.

- *Hospice & at Home Care*

One area that may be overlooked in understanding what protocol exists, or investigating *if* protocol exists, is in how health care providers navigate firearm ownership in hospice settings. We found this is a unique setting for firearm conversations between providers and patients.

E. Challenges to Talking about Firearms and Firearm Safety

The following section examines the challenges that physicians face in how to intervene in situations where they perceive a patient is at risk of experiencing, or re-experiencing, firearm violence. Many of these challenges were described in the context of the different categories of experience described above.

- *Conversations shut down, are uncomfortable, and can lead to distrust*

Many of our participants told us that the biggest challenge to talking with patients about firearms is that these conversations could be uncomfortable and/or can lead to animosity between patient and provider. Some felt that they had managed to learn and teach ways to engage patients about firearms. One participant reported, "I personally talk to patients about it [firearm safety] pretty much every day. I gave a lecture … about gun violence prevention in primary care and what we can do as primary care providers to help screen for people that are at risk."

Despite these outlying experiences, a clear pattern in the data was that conversations about firearms could be volatile. Here is one example:

> Speaker: I don't find [the conversation about firearms] goes great.
> Researcher: Okay, so, tell me how it doesn't go great.
> Speaker: Anger, "You're not taking my gun away," "I'm not locking up my gun," … "You're trying to take my gun. You're just one of those people who doesn't have a gun," or, "You don't like guns."

Many participants categorized conversations about firearms with patients as anger provoking, or "hard" or "sensitive." Some providers were actively testing different messaging strategies in their practice. One participant said, "I felt like, um, every time I would ask the question, I would get a roadblock. So, we were looking at different ways to ask the question, now when I ask it, people actually say, "Oh, it's locked up or it's in a safe."

The difficulty of the conversation leads to inaction in some cases. One participant said, "I also don't have much experience talking [about guns] with people, I mean, occasionally it would come up. In my experience, if I've mentioned it, there's a wall and … it just stops."

In more extreme cases, providers reported that patients would lie or get angry; including accusing the healthcare provider of keeping "tabs" on the firearm owner.

As another example of the animosity that firearm conversations can evoke, some providers who used firearm-screening forms reported that they believe patients are habitually lying to them in the screening, and that the forms create frustration for some patients.

> "Speaker: It ends up not being a great conversation because it's a lot of thinking that the government is out to get them and get their guns, then somehow enslave them.
> Researcher: This comes out when they are filling out the intake form.
> Speaker: Screening forms.
> Speaker: The screening forms, I even thought about taking it out,
> because it's not useful.
> Second Speaker: I agree, it shuts them down so much."

Sometimes the conversation is awkward for the provider. In one instance, a provider we interviewed told us that a patient had brought a firearm to a patient visit for the provider to keep from her elderly relative.

What is clear in this data is that these conversations can be socially disruptive for everyone involved. In many cases, the provider had very little training or tools to deal with promoting firearm safety. In the end, to have such a conversation also seemed frustrating for some providers because there was a lack of demonstrable evidence that interventions via conversation about firearms were making a significant impact on improving firearm safety.

> "Researcher: How many times have you had that conversation with a patient? Like if you said, you should store bullets in a separate location.
> Speaker: I don't know, 70, 80 times. You just do what you're told, as residents. I'm going to get yelled at if I say no, I didn't do that.
> Researcher: How often does it go well?
> Speaker: How often did it like sink in and people were like you were right thank you. Never."

- *Lack of Training*

Providers are talking with patients about firearms, and because of the experience of trial and error, they are getting better at it. However, no one with whom we talked had had any formal training on how to talk with a patient about firearm safety. One participant, who is referencing providers in training below, said the following:

> "It ends up, as you were mentioning, being much more of a personal opinion kind of a discussion on occasions. So, we always bring it up, we always are nervous about bringing it up, we always, evaluate everything … multiple times, everything. And the students are always very appreciative of it being brought up. I don't feel like we've ever resolved anything."

Another said,

> "Just like all of our other cultural competencies, I think gun ownership is a cultural competency that isn't taught in the same way and I'm not sure why not. But I think it could be like we have a perfect model in medical education of teaching cultural competencies and I think this could be one."

From our research perspective, it was challenging to understand how physicians and other providers were learning to speak to patients about firearms – but it was clear that some were clearly adapting to what they saw as a public health crisis within their patient population. What seemed to be consistent, even among providers who told us they often talked with their patients about firearms, was that they were inventing intervention language, loosely linked to data about firearm risk. One exchange between a researcher and a focus group participant was the following:

> "Speaker: I will actually kind of put that in on the end and say, do you have any concerns about gun safety in the home? Are there any questions I might be able to answer and maybe 50% of the time people will engage [with]the pediatrician. Sometimes I do [this]at the very end of the visit.
> Researcher: Are you just adding that adhoc by yourself?
> Speaker: Yes."

- *The Culture Gap*

This research also demonstrated that some providers felt a distinct culture gap surrounding rural firearm owners that exacerbated an already challenging conversation. One participant said the following:

> "I think from a personal training standpoint, sometimes that it'd be really helpful to me being a somewhat new Oregonian to have a hunter come and just talk to me about their guns, …

> like what they mean to them, what they do with them, what is the hunting season? Like, just how it all works, I don't get it. [laughter] … I really don't get it. So, it makes it hard for me to have that conversation."

Another conversation indicated the culture gap from the perspective of someone who had a basic cultural competency in firearm use and ownership.

> "I can only reflect my experience, but there is such a bias of you're a liberal Portland woman who doesn't know anything about guns. How dare you tell me anything and you live in an urban center, how dare you tell me about how to live my life. … but now that I am married to a cop, so I'm always around guns. But now that I can say I am, I am a gun owner, that, that gives me the street cred to have more meaningful discussions about it."

When physicians lack the cultural competency to talk to rural firearm owners in Oregon, then the lack of training becomes more pronounced. For example, one participant said, "As far as being in a rural environment versus urban environment, to talk to somebody about guns, I don't really know how to do it because I've never really gotten any training."

- *Lack of data*

Multiple providers said that the lack of data and lack of clear protocols to follow made them hesitant to have a conversation with their patients about firearms. One participant said:

> "The motivation to have the hard conversations I think are comparable on quitting smoking or quitting drug use. Those can be unpleasant conversations, but I know there's data backing me up that every time you approach, every time you bring it up in the right way, you increase your chances of stopping. So, there's a reason that I'm gonna have that hard conversation. I don't mind if they get mad or angry at me. I don't have that data for guns, or I'm not aware of any. So, I feel like I'm getting into this unpleasant conversation, this person's gonna get angry at me, and I can't back myself up and say that it's really doing them any good, ... There's 18 other discussions I could have where I have some data that might affect them, you know?"

Another participant expressed the thought that before the data, any conversation is just judgement. They said, "like, everything else in medicine, that's a public health issue. We then have the data that explains why we're doing what we're doing and it's no longer judgement, it's no longer me telling you this. It's, "the data shows this." you can have a reasonable conversation about how to proceed."

Surgeons were also concerned about when and if there were an empirically proven moment, in which having a conversation with a patient would be useful. One surgeon said,

> "Although there's been good research, that, those that screen positive for alcohol use that …talking about safe alcohol use helps – that hasn't held up for drugs and there hasn't been research about whether it's the teachable moment for asking about guns and because it hasn't held up for drugs, even though it did hold up for alcohol, I just, I wonder. Not that you want to push stuff down the road, but you know, are we the right people to train to do it? Is this a teachable moment for them? Um, you know, the primary care people have way too much to do already, but you know, what is the right, the right approach?"

- *Lack of Next Steps*

Other providers pointed out that there was often no protocol on what to do if a patient said they did NOT store their firearm in a safe place, or did NOT intend to remove it in case of suicidal ideation. One participant said, "If I don't have a way to then act on that information, then why am I asking the question in the first place?" Another said, "What do you do with that information. … If as soon as the gun question comes up, then you just go home and lie in bed and know that Jim lives down the street, with terrible depression, terrible anxiety, and he's got guns, you can't do anything about it. So, it's like, if you can't treat why test?" Finally, one participant told us, "Some patients obviously don't have the mental capacity to be carrying a gun. Sometimes I'll push that along to the physician, discuss it with their physician, I don't really have a good outlet of where I need to go with some of the stuff."

Another provider said: "I think in the outpatient setting, having the actionable item, like if we just focused on gun storage, knowing what that next step would be. … If you screen like you don't have food or you don't have transportation, we have an actionable next step of what to do. There's not a uniform next step." From an intervention standpoint, the lack of "next steps" or protocol for what happens once a health care provider flags an issue is likely a significant barrier to intervention.

- *Difficult decisions – firearms and the right to die*

Some providers talked about times when their role was unclear for a patient who was experiencing suicidal ideation, had attempted suicide, or had a debilitating disease. In one case, a physician told us that a patient had shot themselves in the emergency room. As the physician said, "my residents were on the code team and went to code him, and were incredibly conflicted about what it meant to code someone who had tried to kill themself in the hospital."

Another participant discussed a patient who had advancing Parkinson's disease and had expressed frustration at losing function. Participants asked what it meant to try to intervene on firearm safety when someone was in the later stages of their lives, or in other extreme situations.

- *Lack of Time*

Researchers expected that a lack of time would be cited as a reason it was challenging to have conversations about firearms – and it was. Some providers questioned the ability of a provider to handle all safety issues or risks with which a patient might come into contact. They said, "The one concern I have is, are we expanding the well visit to the point where it's going to take us an hour to do every well visit? But I have the thought as we're becoming more and more aware of earthquakes, if we added a safety question, you know, "Do you have extra water in your home because of the possibility of an earthquake? By the way, do you have guns?"

One participant said, "I mean, in my current practice I would say honestly out of the things I have, … it doesn't rise to top priority."

To put the demands on a primary care physician and pediatric primary care physician into perspective, one provider told us:

> "Speaker: I don't know how many questions are mandatory for us to ask now and intervene on. …
> Researcher: Yeah.
> Speaker:--and … maybe they don't have enough food.
> Researcher: Okay.

Speaker: So, you're like having to deal with a lot.
Researcher: Yeah.
Speaker: So, adding another thing is a lot."

Others disagreed that the timing was insufficient to have a conversation about firearms, suggesting that they have to work so many things into their workflows and that given the relevancy of this topic, they should find a way to do it.

- *Diversity of Healthcare Providers*

More than one provider pointed out that opinions on firearms among providers were not uniform. The political and cultural nature of firearms, paired with the lack of data on successful intervention, created a unique condition where – while all of our participants expressed concern for their patients and concern for firearm violence – there was disagreement about the best way to confront firearm violence and best practice for providers.

Our participants also disagreed on the role a provider should play in the issue. Some participants felt that firearm violence was best engaged at a community or policy level, others were committed to interventions in healthcare settings. Some providers saw firearm violence as a monumental challenge to public health, others thought that their patients were confronting much larger health challenges, and that removing firearms from their home or keeping firearms in a safe was not as significant of an issue.

- *Those who are intervening*

Hospice care and the VA are the areas in which there seemed to be significantly more guidance on how to discuss firearms with patients. While the vast majority of those interviewed had had no formal training, and knew of no training regarding interventions around firearm safety, one outlying participant said:

> "It's become a routine part of every encounter I have with someone who's depressed, primarily if they're really suicidal. And then we also teach our residents how to have these conversations and ask them at staffing encounters, 'You know, it sounds like your patient is really depressed. Did you talk about suicide?' And of course, 'Did you ask about guns and how they're stored?'
>
> So, we do make that a part of the didactic curriculum with the VA clinic residents, …. and then we do it as a didactic session with them. So, we do it in every staffing encounter and then it's a didactic session."

It was unclear to researchers if those interventions are monitored for success.

- *Firearms as Trust Building*

Interestingly, there was one category of experience that came up in every focus group, that demonstrated the positive outcomes of firearms as a cultural object. For providers who owned a firearm, or had experience with firearms, talking to patients about their firearms was a) easier; and b) was a trust building exercise. This was so significant that even if providers were not talking about firearm safety, or intervening with a patient that they worried may be exposed to firearm violence, bringing up and discussing firearms was a way to build trust between provider and patient. As researchers who have

worked on the cultural nature of firearms in the past, we recognize these "winks" as a potent symbol of non-judgement, class, and in-group solidarity.

One interviewee said:

> "Speaker: And so, it's not unusual for me to have conversation with a police officer or a, you know, court officer, or an ex-military person, I'll say, "So, what do you carry?"
> Researcher: As a trust building exercise?
> Speaker: And they'll tell me what they carry. You go, "But what's the one on your ankle?" And then they'll smile and they'll tell me, "Oh, it's…" you know.
> Researcher: Yeah
> Speaker: It's a single [inaudible]. Uhm, and so, it-it really is a trust building. And-and it… and a lot of them, and a lot of times, they'll just look at me like, "Oh, you're not a tool."

Another said:

> "If it is somebody that uses guns as a recreation or sport, I will engage as best I can in that conversation with them trying to find a common ground - just to have a conversation about anything, about them as a person. … So I will engage about, you know, what shooting range do you go to? What do you hunt, what types of guns do you use? But it's more, it's not in a firearm safety way. [It's] trust building, rapport building."

The interesting thing about the cultural nature of firearms is that the very sensitive nature of the topic both makes intervention conversations difficult, *and also* creates the potential to bond providers with their firearm-owning patient population.

CONCLUSION

There is much to be learned about firearm violence writ large, and much to understand about how the healthcare community, specifically, is responding to firearm-related violence. It was particularly noteworthy to us that, in Oregon, rural/urban divide issues loom large in understanding the nature of firearms in people's lives. These cultural issues come to the fore when providers and patients discuss firearms and there is potential to alienate firearm-owning patients if this conversation goes poorly. This project helps to layout categories of experience physicians and other healthcare providers have in relation to firearm safety interventions; and lays out challenges present in those experiences. Future research could be directed at understanding and testing strategies to mitigate those challenges.

Table 1: Characteristics of 22 Providers and their Practices	
Provider Participant Characteristics	
	Percentage
Age group	
25-35	9.1%
36-50	45.4%
51-65	22.7%
66 or older	22.7%
Years in practice	
1-10	18.2%
11-20	31.8%
21-30	27.3%
31-40	9.1%
41 or more	13.6%
Practice type	
Urban/suburban	50.0%
Rural	50.0%
Specialty	
MD/DO Primary care/Family medicine	27.3%
MD/DO Internal Medicine	31.8%
MD/DO Other specialty	40.9%
Nurse Practitioner, Physician Assistant	27.3%
Provider race/ethnicity	
White	81.8%
People of color	4.5%
Multiple	4.5%
Not answered	9.1%
Political affiliation	
Democrat	59.1%
Republican	9.1%
Independent or other	31.8%
Practice Characteristics	
Patient race/ethnicity	
Primarily white	54.5%
Primarily people of color	0.0%
Both	36.4%
Not answered	9.1%
Patient Socioeconomic characteristics	
Primarily live above the poverty line	9.1%
Primarily live below the poverty line	22.7%
Mixed patient population	45.4%
Not answered	18.2%
Patient age groups	
Primarily children	31.8%
Primarily adults	45.4%
Mix of children and adults	22.7%
Primarily people under 65	9.1%
Primarily people over 65	18.2%
Mix of people under and over 65	50.0%
Patient languages	
English as first language	45.4%
English as second language	0.0%
Mixture of languages	45.4%
Not answered	9.1%

Appendix V. Contributors and Support

A. OHSU – PSU Gun Violence as a Public Health Issue Advisory Committee

https://www.ohsu.edu/GVPHI

The mission of the Gun Violence as a Public Health Issue (GVPHI) Initiative is to prevent firearm-related violence and injuries in Oregon by applying public health approaches. We are concerned community members, health care and public health professionals, researchers, and survivors with lived experiences. Our work is guided by anti-racism, community engagement, and collaborative principles. Through research, education, advocacy and action, we will identify the causes and consequences of gun violence and advance best practices and policies for prevention and healing.

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