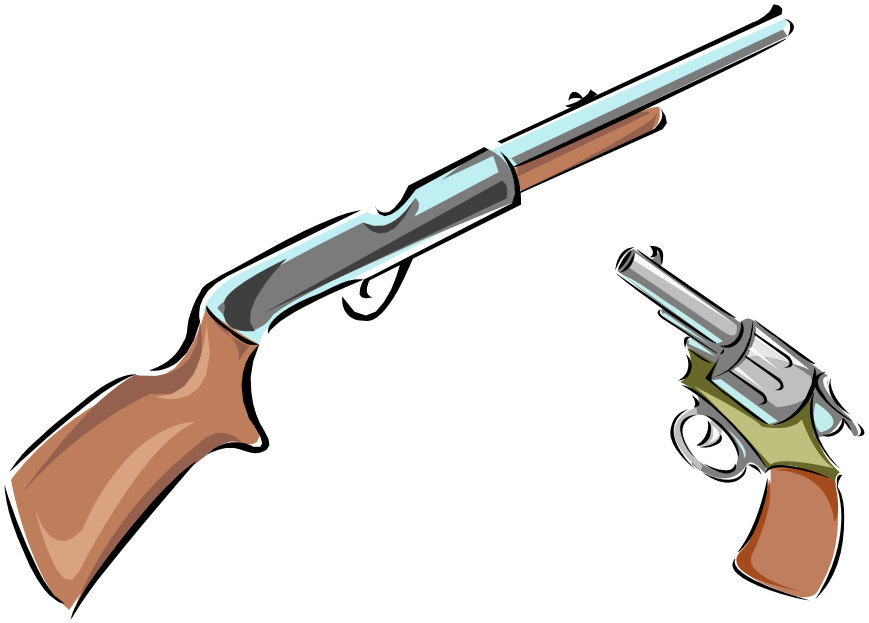
New Mexico
Gun-related Injury Surveillance
in
Hospital Emergency Departments



NEW MEXICO
DEPARTMENT OF
HEALTH

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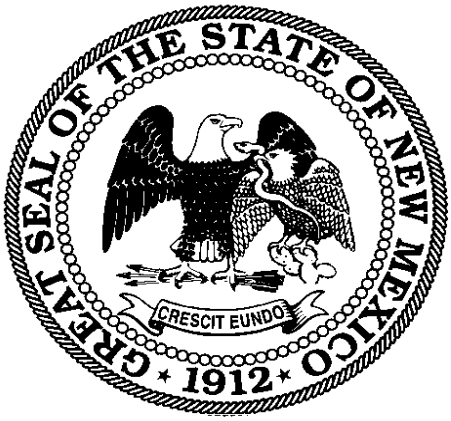

State of New Mexico
Governor
The Honorable Bill Richardson

New Mexico Department of Health

Dr. Alfredo Vigil, M.D., Secretary

Epidemiology and Response Division

C. Mack Sewell, Dr. P. H., M.S., Director and State Epidemiologist

Michael Landen, M.D., M.P.H., Deputy State Epidemiologist

John Booker, Ph.D., Injury and Behavioral Epidemiology Bureau Chief

Office of Injury Prevention

Barbara F. Chatterjee, M.S., Injury Epidemiology Program Manager
Isaac Romero, B.A., Management Analyst

Report Development Consultant
James W. Davis

NEW MEXICO DEPARTMENT OF HEALTH

Alfredo Vigil, MD
Secretary

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Katrina Hotrum
Deputy Secretary

Duffy Rodriguez
Deputy Secretary

Jessica Sutin
Deputy Secretary

Karen Armitage, MD
Chief Medical Officer

To New Mexican policymakers and interested residents:

I am proud to provide to you the **New Mexico Gun-related Injury Surveillance in Hospital Emergency Departments: 2002-2006,** the first report issued in the state to be derived from the New Mexico Department of Health's Emergency Department-New Mexico Firearm Injury Surveillance System (ED-NMFISS). In 2000, when gun-related injuries became a reportable condition, the Department of Health established the surveillance system to help track non-fatal injuries caused by guns as a starting point to become better informed on how to prevent them.

This report, based on the first five years of full data collection on gun-related injuries, brings to light such factors as:

- NM emergency departments see an average 633 gun-related injury visits a year
- 73% involved firearms (powder weapons) and 20% involved BB and pellet guns
- 15- to 29-year-olds had the highest rates of non-fatal firearm injuries
- 10- to 14-year-olds had the highest rate for BB/Pellet emergency department visits
- An average of 45% of firearm injury cases were treated and released from the emergency department, but another 43% were admitted as inpatients
- Unlike overall injuries, with one death for every 118 non-fatal injuries treated, emergency departments reported one gun-related death for every 1.2 non-fatal visits.

From a public health perspective, reducing the risk of gun-related injuries is an important goal for improving the well-being of our population. This report is designed to provide health care providers, policymakers, program planners and our communities with currently available information on gun-related injuries in New Mexico to guide them in achieving that goal.

Sincerely,

Alfredo Vigil, MD
Secretary

Table of Contents

Executive Summary

Guns have long attracted attention in New Mexico because firearms have been a leading cause of injury death, claiming about 300 lives per year. In 2000, firearm injuries were the second leading cause of injury death (after motor vehicle crashes). More recently firearms have dropped to fourth place as the toll from drug overdoses and falls have risen.

Little documentation, however, has been available on non-fatal gun-related injuries and their impact on New Mexicans. The State began addressing this gap in 2000 by making firearm injury a notifiable condition for public health monitoring and then establishing the Emergency Department-New Mexico Firearm Injury Surveillance System (ED-NMFISS). This system collects data on injuries from all types of guns that are treated in hospital emergency departments (ED).

By January 1, 2002, all EDs in non-federal hospitals plus several with the Indian Health Service reported visits to ED-NMFISS for the entire year. With five years of data, 2002-2006, several noteworthy findings are emerging. The new data in this report, New Mexico Gun-related Injury Surveillance in Hospital Emergency Departments, describes the key findings about non-fatal injuries caused by guns in an effort to identify opportunities for lowering the risk for these injuries.

Findings

From a public health perspective, reducing the risk of injuries is an important goal for improving the well-being of our population. Gun-related injuries have a unique pattern in that for every death, all from firearms, the EDs identified 1.2 non-fatal visits. This pattern is unlike overall injuries with one death for every 118 non-fatal injuries treated.

Overall 3,165 visits for gun-related injuries were reported by NM emergency departments between January 1, 2002 and December 31, 2006. These include 2,986 initial visits and 179 transfer or other secondary visits. ED-NMFISS collects data on ED visits on all types of guns and blunt trauma involving a gun. Approximately 6% of injury incidents (32 per year) resulted in death in the ED. During these 5 years, 27 people were identified with two separate incidents of gun-related injuries; the time between these incidents ranged from a few days to almost three years.

The non-fatal gun injury ED visits averaged 633 per year, and of these 402 were by firearms and 119 by BB and pellet guns. The characteristics associated with injuries from these two gun types follow.

Firearm Injuries

For firearms the highest rates of non-fatal injuries were among 20-24 year olds at 70.5 per 100,000 population, followed by persons aged 15-19 years and 25-29 years. Ninety

percent were males. Blacks, who comprise only 2% of the NM population, had the highest rate of firearm injury visits at 32.3 per 100,000 population; their rate was followed by that for Hispanics at 29.1, while Native Americans had the lowest rate at 10.6. The highest rates of non-fatal firearm injury occurred in five southern counties: Chaves, Eddy, Lea, Grant and Luna.

Among the firearm injuries, 94% were from bullets and the remainder from shotguns. The patient was discharged to home in 45% of the firearm injury ED visits, while another 43% were hospitalized.

Ninety percent firearm injuries were to a single area of the body—head, arms, legs, chest, abdomen or back. Over half were to the extremities with 33% to the legs and 19% to the arms. As a gauge of severity, 76% cases with injuries to the torso and 71% with injuries to multiple wound sites required hospitalization or transfer; in contrast only 36% of injuries to the extremities received these levels of treatment.

BB/pellet Guns

BB/pellet gun injuries consistently showed higher rates of non-fatal injuries than firearms for persons under 15 years of age. The highest rate was in the 10-14 year age group at 30.4 per 100,000 population. Females comprised 15% of BB/pellet gun injury visits, compared to 10% for firearm injury visits. Hispanics and Native Americans tied with the highest rates for BB/pellet gun injury visits at 7.8 per 100,000 population.

Ninety-one percent of ED visits for BB/pellet gun injuries were discharged to home, and about 6 cases per year required hospitalization. Among those admitted, 45% had injuries to the head.

Goals and Recommendations

- Investigate further the characteristics of persons with two or more gun-related injury ED visit.
- Distribute ED-NMFISS data widely to support gunshot wound prevention work.
- Establish de-identified files for analysis by other data users.
- Improve collection of gun injury data and fold it into a broader ED surveillance system for New Mexico.

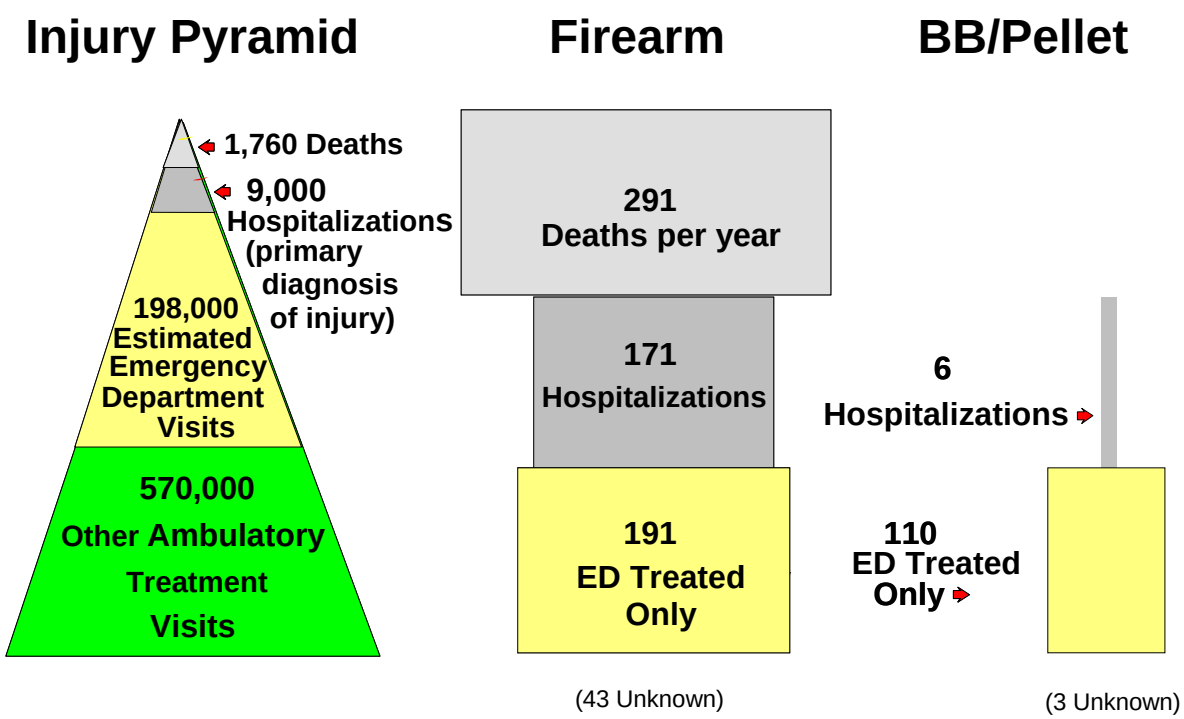
Introduction and Overview

Introduction

Nationally, an estimated 64,000 gunshot and 20,000 BB/pellet gun non-fatal injuries are treated in emergency departments each year [1]. The New Mexico rate for firearm deaths ranked 10th among the 50 states in 2005 [2].

Firearms had been the second leading cause of injury death in New Mexico for many years, causing 250 to 300 deaths per year. In 1998 the rate dropped to third behind poisonings. It has continued to decline reaching fourth behind falls in 2005. Although information on firearm injury deaths is available from death certificate or medical examiner data, little documentation is available on non-fatal firearm injuries, of which cases treated in hospital emergency departments (ED) or as inpatients occur 1.2 times as often as deaths (See Figure 1). The low value of the ratio of non-fatal to fatal injuries underscores the lethality of this cause of injury.

Figure 1. Outcomes of All Injuries and Gun- Related Injuries Among New Mexico Residents



Sources: NM Department of Health, Epidemiology and Response Division 2002 - 2006
CDC WISQARS 2001-2004, NM Vital Records 2005

In Figure 1 the severity of firearm injury is contrasted with that of all injuries requiring medical care. The usual pattern for injuries is shown as a pyramid where deaths form the tip. Overall, approximately 118 injuries require ED treatment or hospitalization for each death. For firearm injuries, the relationship is 1.2 injuries that require ED treatment or hospitalization for each death. BB/pellet injuries resulted in 119 non-fatal ED visits, but no fatalities.

To address the lack of information about non-fatal gun-related injuries, medical care visits for firearm injuries were made reportable to the New Mexico Department of Health (NMDOH) as of January 1, 2000. The Emergency Department-New Mexico Firearm Injury Surveillance System (ED-NMFISS) was established as a tracking mechanism for gun-related injuries. Full implementation, with all non-federal and some Indian Health Service (IHS) hospital EDs reporting, was achieved in 2002, which was established as the baseline year for ED-NMFISS. (See also Methodology in Appendix 1)

ED-NMFISS fills an important gap by permitting estimation of hospitalizations and the ED visits. New Mexico's Hospital Inpatient Discharge Data (HIDD) does not identify all inpatient cases because of incomplete External Cause of injury coding (E-coding) and other system limitations. HIDD data available for years 2002 through 2005 identified on average 124 gun-related injury hospitalizations per year; this compared to the 177 gun-related injury hospitalizations documented in ED-NMFISS per year.

ED-NMFISS collects data to characterize persons treated for gun-related injuries in New Mexico emergency departments. This includes all cases with wounds from powder and non-powder (BB, pellet) guns, gun-like devices such as paint ball and taser guns, and blunt trauma inflicted with a gun (e.g. pistol whipping). The system is designed to account for all cases that involved a gun or gun-like instrument in any way.

Each gun-related injury ED visit is characterized by three data elements:

- Gun wound type: the type of firearm/other gun mechanism of injury
- Body region: the wound location(s) on the body
- Discharge status: the outcome of the ED visit

The individuals involved are characterized by:

- Age
- Gender
- Race
- Ethnicity
- Residence –city, county, state and zipcode

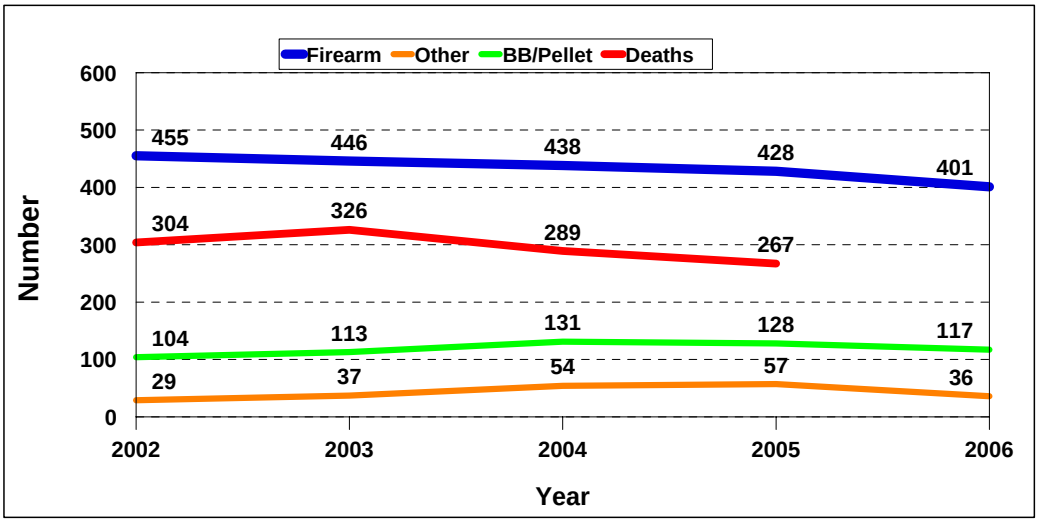
Including identifiers for internal record management, ED-NMFISS collects 14 data elements on each ED visit. All New Mexico general hospitals with EDs have reported in all five years. Several Indian Health Service (IHS) hospitals are regular participants in the system.

Overview

This report describes the 3,165 NM emergency department (ED) visits for gun-related injuries from 2002 through 2006 and serves as the first summary presentation from ED-NMFISS. Included in this analysis were 2,986 initial visits to EDs for gun-related injuries in the five years. Of these, 73% involved firearms (powder weapons), 20% BB and pellet guns, and 7% blunt trauma and wounds from other gun-like instruments. Information was also collected on 179 transfer or other secondary visits.

The number of injuries from firearms declined slowly over the period, but injuries from other types of guns were generally increasing.

Figure 2. Annual Reported Initial ED Visits by Gun Type, NM, 2002 – 2006



Notes: 12 ED visits of unknown gun type excluded; N=2,974
Other represents injuries from other gun-like instruments, including blunt trauma
Source: ED-NMFISS, NMDOH

The Other injuries include those from other gun-like instruments (e.g. Tasers, nail guns and paintball guns), from shrapnel or the mechanism of a gun, and injuries from blunt trauma (pistol whipping). An average of 43 such injuries occurred each year (Table 1). These types of injuries may not be consistently reported for a variety of reasons, such as ED staff not associating the cases with the ED-NMFISS. (See also ED utilization patterns in Appendix 2)

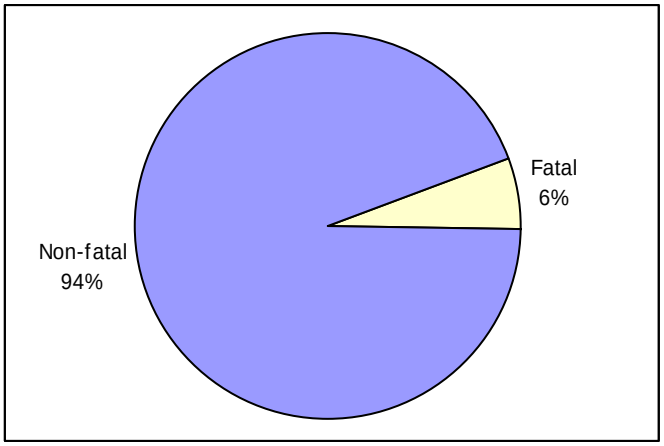
Table 1. Injuries from Other Gun-related Causes, NM, 2002-2006

Other Injuries	Total 2002-2006	Annual Average
Taser	82	16
Blunt trauma	60	12
Nail/Staple guns	24	5
Paintball guns	17	3
Shrapnel/secondary	14	3
Other	16	3
Total	213	43

Source: ED-NMFISS, NMDOH

About six percent (32 per year) of reported gun-related visits were pronounced dead in the ED (Figure 3). All of these deaths were due to firearms. Since the fatalities reported by the EDs were 11% of the total firearm injury visits, a relatively small fraction of all firearm-related fatalities, they are excluded from the analysis in this report. Instead, data from death certificates collected by the NM DOH, Bureau of Vital Records and Health Statistics (BVRHS) were used to complete the picture of firearm injuries (Figure 2).

Figure 3. Annual Average Fatal and Non-fatal ED Visits, NM 2002 - 2006



46 annual cases with unknown outcome (transferred or unknown) excluded; N=552 per year
Source: ED-NMFISS, NMDOH

Excluding deaths, transfers and other secondary visits, 2,826 non-fatal injury visits were reported, including 2,008 (402 per year average) injuries due to firearms and 593 (119 per year average) injuries due to BB and pellet guns. Because Firearm and BB/Pellet gun ED visits show very different patterns, these results are reported separately in the next two sections.

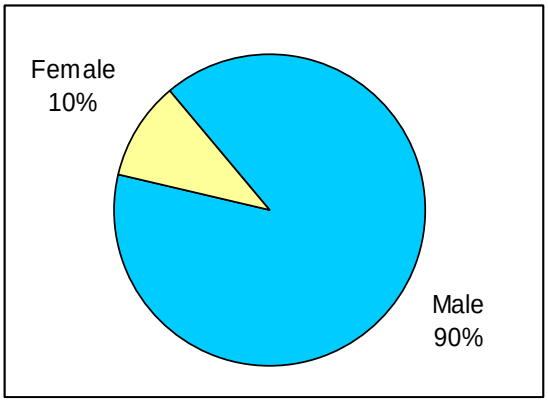
Non-fatal Firearm Injuries

This section on firearm (powder gun) injuries characterizes the non-fatal incident visits treated in New Mexico hospital emergency departments (ED). These injuries comprise the largest number of visits and the most severe injuries.

Over the 5-year period, 2,008 non-fatal firearm injury incidents were reported, for an average of 402 per year. (Appendix 3 contains detailed data for this section)

Demographics

Figure 4. Annual Average Firearm Injury Visits by Gender, NM, 2002 - 2006



N=402 annual average
Source: ED-NMFISS, NMDOH

- Males accounted for 90% of ED visits related to firearm injuries.
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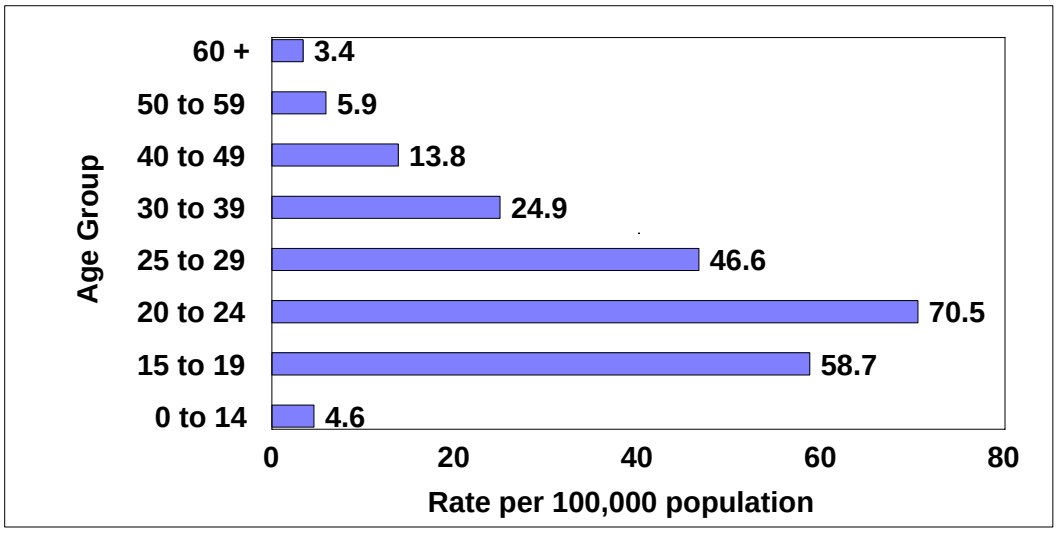
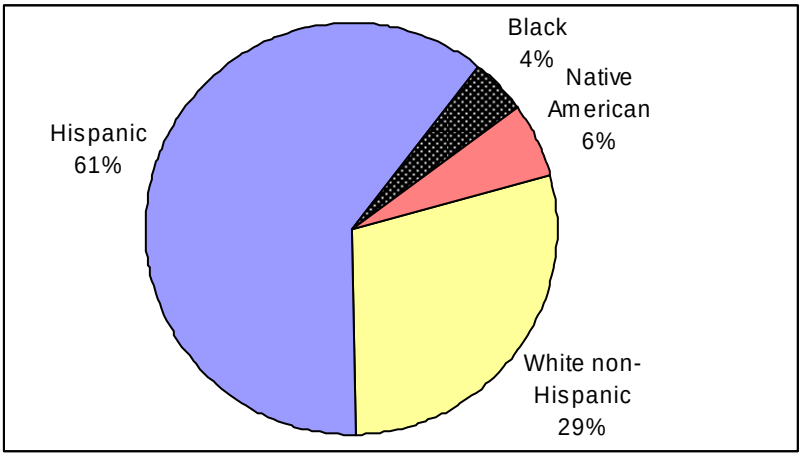
Figure 5. Average Annual Non-fatal Firearm Injury Rate by Age Group, NM, 2002 - 2006



N=402 annual average non-fatal visits; 291 annual average deaths
Source: ED-NMFISS, NMDOH and CDC WISQARS [3]

- The age distribution for females was quite similar to that for males (Tables 7 and 8).
- 20-24 year olds had the highest rate at 70.5 per 100,000 population. This age range was also known to have high rates for other types of injury, notably motor vehicle crashes (e.g. NHTSA 2005 Overview).

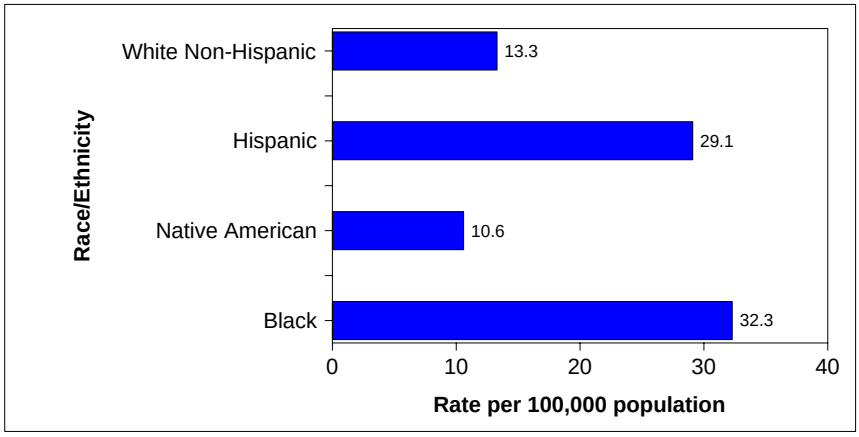
Figure 6. Average Annual Non-fatal Firearm Injury Visits by Race-Ethnicity, NM, 2002 - 2006



N=402 annual average
Note: Hispanic includes persons who report either white or other race
Source: ED-NMFISS, NMDOH

- The Hispanic category was a combination of those who report White race (78%) and those who report Other race (22%).

Figure 7. Average Annual Non-fatal Firearm Injury Rate by Race/Ethnicity, NM, 2002 – 2006



N=402 annual average
Asian group excluded due small numbers (an annual average of zero).
Source: ED-NMFISS, NMDOH

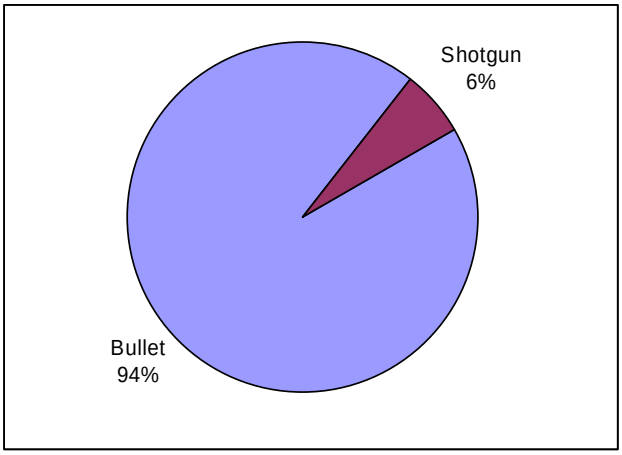
- Notably the rate for Hispanics was more than double the White non-Hispanic rate, and almost 3 times the Native American rate, though some under-reporting

was likely in the latter group because not all federal hospitals participate in ED-NMFISS.

- Blacks had the highest rate at 32.3 per 100,000 population, but this rate is based on a small number of cases (an annual average of 17) and varies considerably from year to year. The fraction of ED visits for firearm injuries by Blacks at 4% was twice their representation in the overall population.

Firearm Injury Specifics

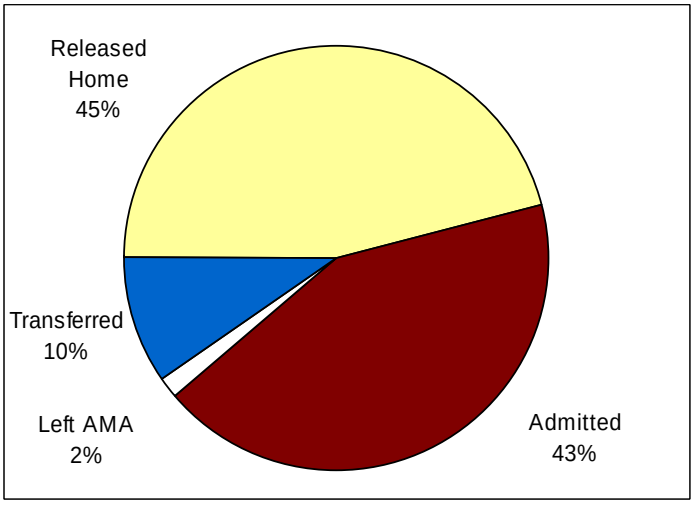
Figure 8. Average Annual Non-Fatal Firearm Injury Visits by Wound Type, NM, 2002- 2006



N=402 annually
Note: in ED-NMFISS, gun type is determined by ED staff from the character of the wound and the projectile if recovered.
Source: ED-NMFISS, NMDOH

- Bullet wounds comprised the vast majority of firearm injuries; shotgun wounds are relatively uncommon involving only 6% of cases.

Figure 9. Average Annual Non-Fatal Firearm Injury Visits by ED Disposition*, NM, 2002 - 2006



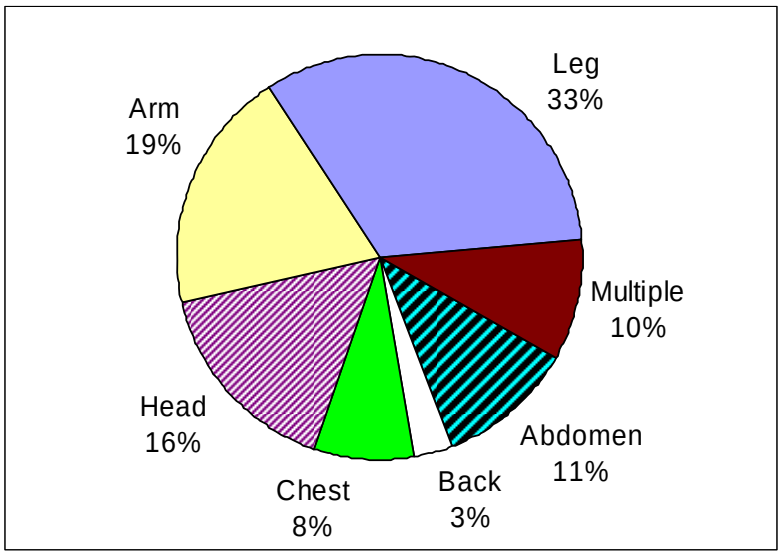
N=402 annual average

* Based on the disposition at discharge from the last ED providing treatment.
** Left AMA is “left against medical advice” reflecting people who left the ED before treatment was completed.
Source: ED-NMFISS, NMDOH

- The discharges for non-fatal firearm injuries were nearly equally split between those who are released home and the more serious wounds that require hospitalization.
- An average of 45% of firearm injury cases were treated and released from the ED, and 43% were admitted.
- 10% of cases were transferred out of the New Mexico ED system, so the final disposition is unknown.
- Of the 131 cases in this 5-year period that were transferred to other NM emergency departments that reported to ED-NMFISS, 74% were admitted.

Body region injured is another way to characterize firearm injuries. Ninety percent of injured persons were wounded in only one body region.

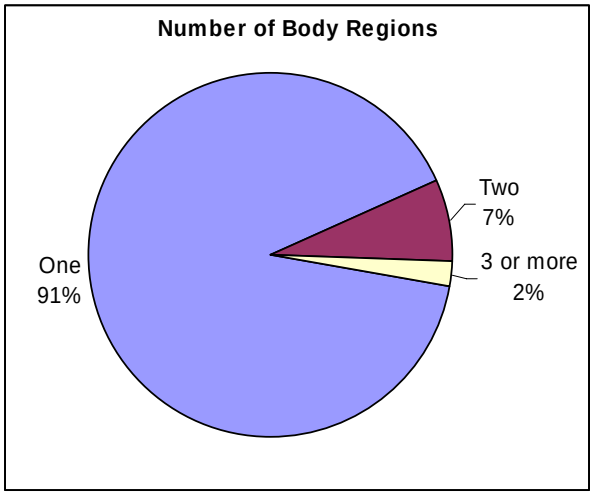
Figure 10. Average Annual Non-Fatal Firearm Injury Visits by Body Region, NM, 2002 – 2006



N=402 annual average
Multiple means the patient had wounds to two or more body regions. A body region is counted only once, regardless of the number of wounds sustained in that region.
Source: ED-NMFISS, NMDOH

- Injuries to the extremities alone, legs (33%) and arms (19%) accounted for more than half (52%) of firearm injuries.

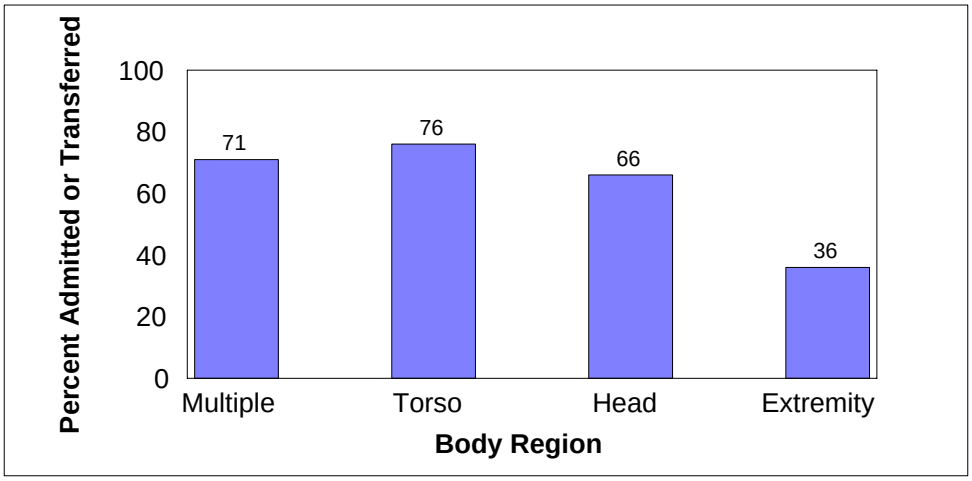
Figure 11. Number of Body Regions Injured by Firearms, NM, 2002-2006



N=402
Source: ED-NMFISS, NMDOH

- An average of 38 patients per year had injuries to more than one body region.
- Of those with injuries to more than one region, 85% had injuries to the head or torso, and 15% had injuries to the extremities only.

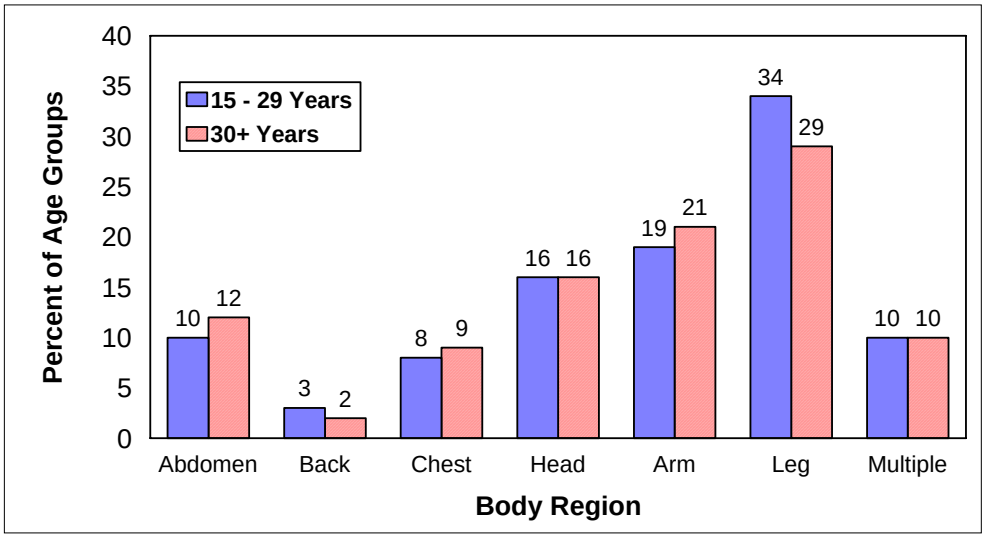
Figure 12. Percent of Non-Fatal Firearm Injury Visits Admitted or Transferred by Body Region, NM 2002 – 2006



N=402 annual average
Notes: 1) Multiple means the patient had wounds to two or more body regions. A body region is counted only once, regardless of the number of wounds sustained in that region.
2) Torso combines abdomen, back and chest; extremity combines arm and leg.
Source: ED-NMFISS, NMDOH

- Injuries to the extremities (52% of cases) were the least likely to result in hospitalization or transfer.
- The fraction of cases admitted or transferred ranged from 36% for injuries to the extremities to 76% for injuries to the torso.

Figure 13. Firearm Wound Sites for Selected Age Groups, NM, 2002- 2006

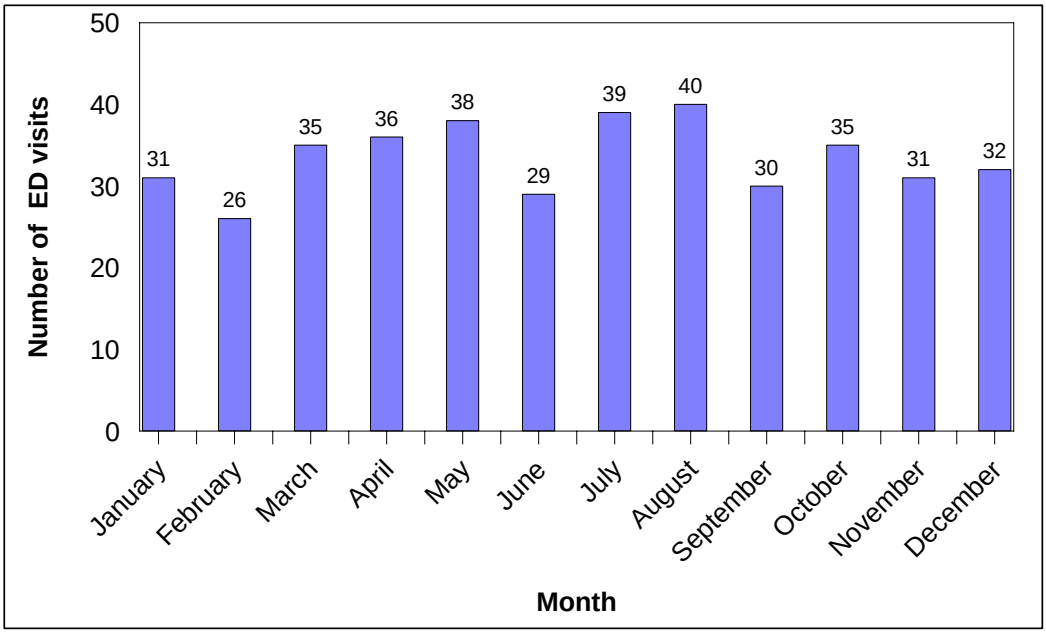


Annual average N=255 for 15-29 and N=127 for 30 and over
Source: ED-NMFISS, NMDOH

- Those 15-29 had a higher fraction of injuries to the leg than those 30 and over.

Seasonal patterns were explored for firearm injuries. These showed limited variation throughout the year, ranging from 25 ED visits in February to highs of about 40 in July and August.

Figure 14. Firearm Injury Visits by Month, NM, 2002-2006



N=402 annual average visits
Source: ED-NMFISS, NMDOH

- Firearm injuries were in general highest in the summer for those 15-29, who accounted for 63% of non-fatal firearm injuries. February, June and September had lower numbers of injury visits when compared to adjacent months for this age group.
- The seasonal pattern was not as strong for persons 30 years and older, with similar numbers all year long. In this age group, February, June, and to a lesser extent September also had fewer injuries than adjacent months.

County of Residence

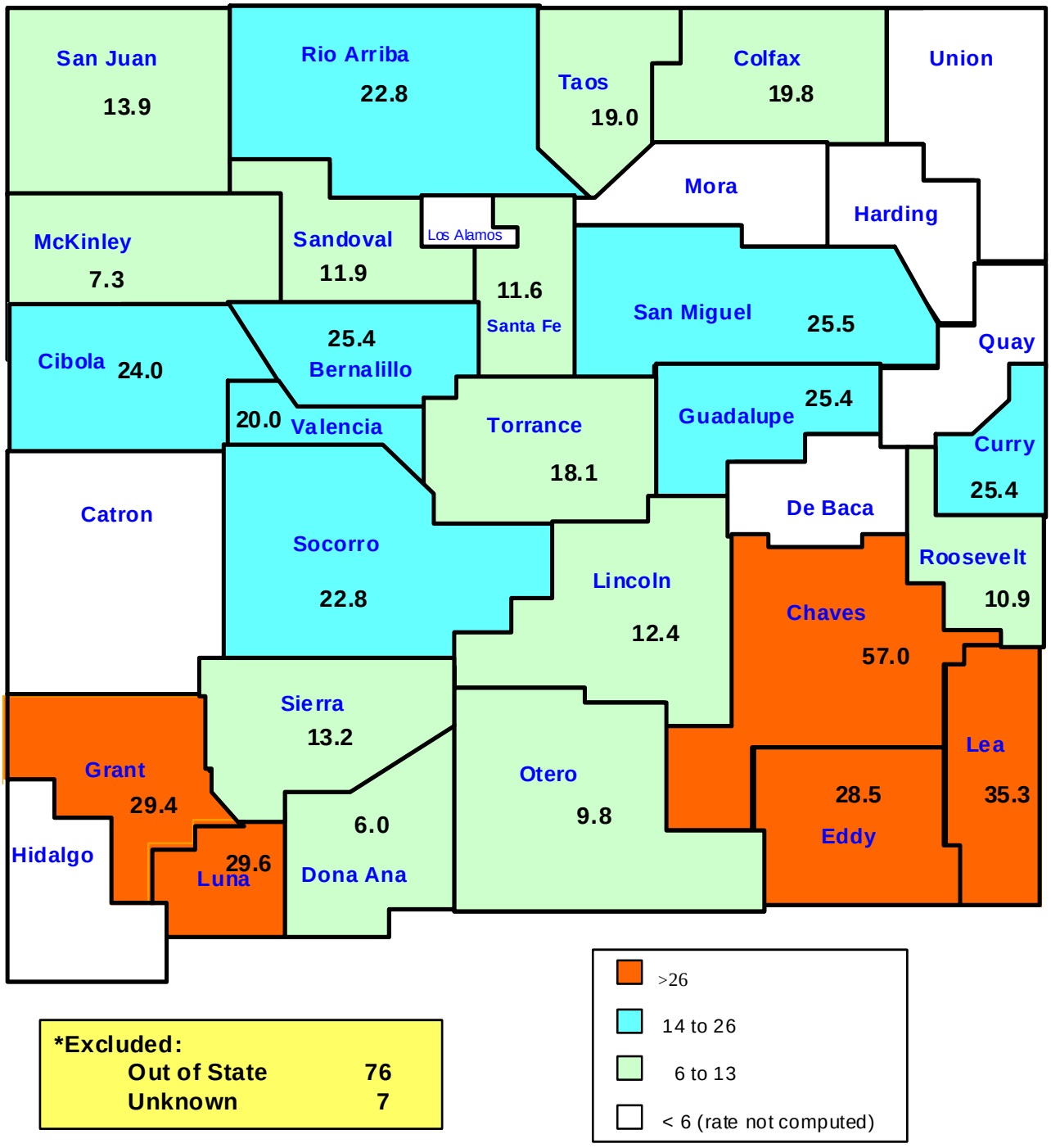
A map showing the rate of non-fatal firearm injuries by county is on the next page.

- The highest rates of non-fatal firearm injury occurred in five southern counties: Chaves, Eddy, Lea, Grant and Luna.
- Very low rates for some border counties, suggest that some cases may be going directly to out-of-state facilities.

Figure 15.

New Mexico Emergency Department
Non-fatal Firearm Injury

Rates per 100,000 Population by County of Residence
2002 – 2006 New Mexico (N=1,925)*
New Mexico Rate 20.0



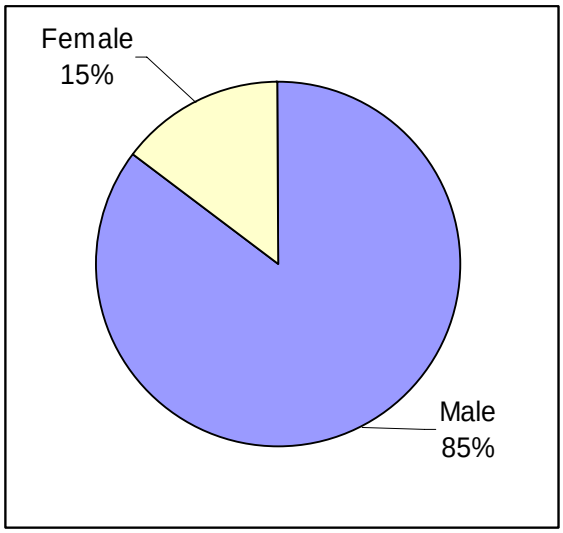
*Excluded:	
Out of State	76
Unknown	7

BB and Pellet Injuries

As part of the ED-NMFISS system attention is also given to air guns that fire BBs or pellets. While no fatalities were documented from these guns, they lead to an average of 119 ED injury visits annually. The population associated with these types of injuries differs from those from firearms. ((Appendix 4 contains detailed data for this section)

Demographics

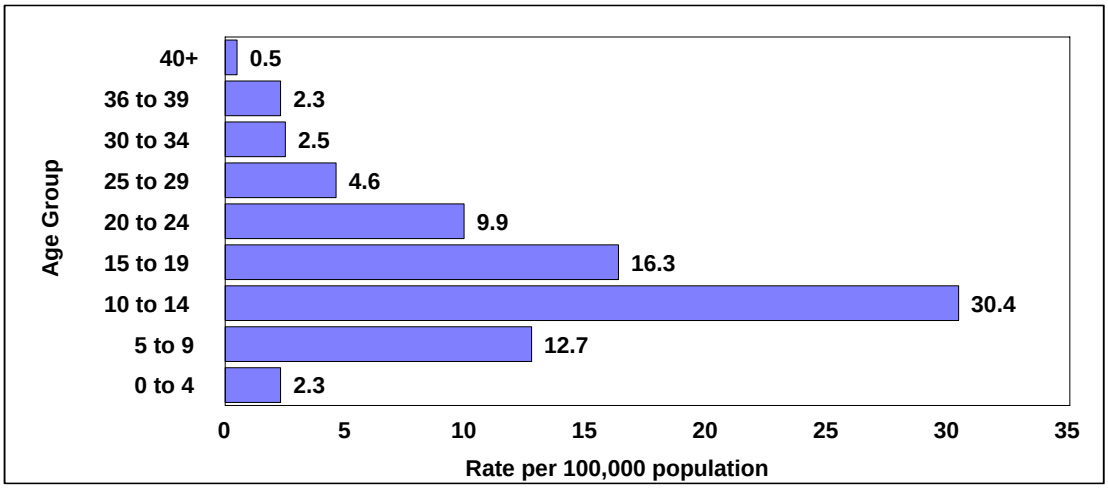
Figure 16. Average Annual BB/Pellet Injury Visits by Gender, NM, 2002 - 2006



N=119 per year
Source: ED-NMFISS, NMDOH

- Females accounted for 15% of BB/Pellet injury visits, compared with 10% of those from firearms.

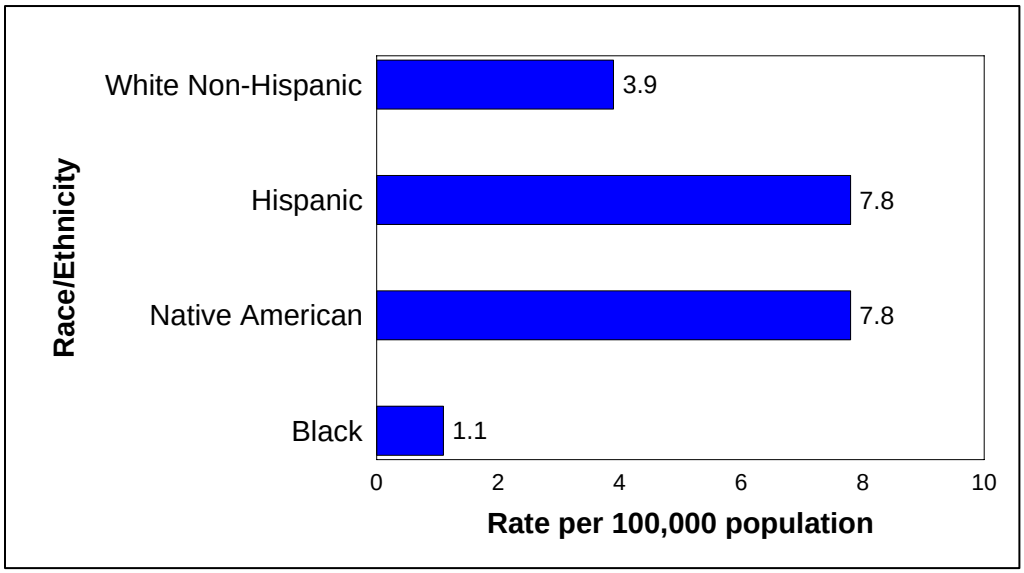
Figure17. Average Annual BB/Pellet Injury Rate by Age Group, NM, 2002 – 2006



N=119 per year
Source: ED-NMFISS, NMDOH

- The highest rate for BB/Pellet injuries was in the 10-14 year age group, at 30.4/100,000, which was nearly double the number of visits by 15-19 year olds.

Figure 18. Average Annual BB/Pellet Injury Rate by Race/Ethnicity, NM, 2002 – 2006

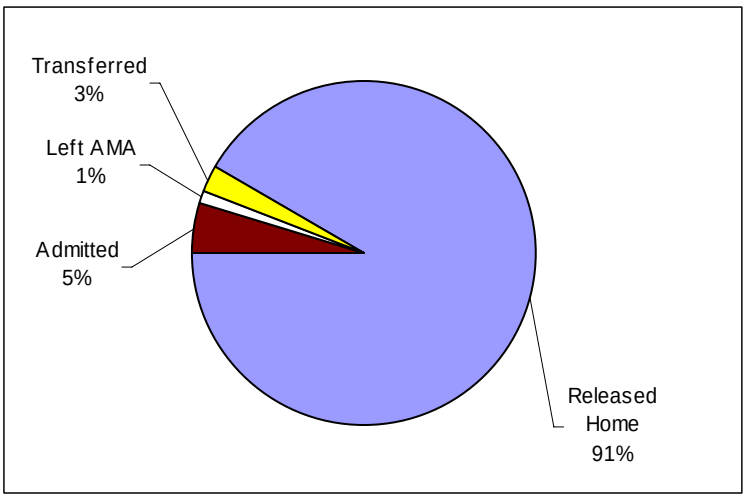


N=115; 4 unknown racial/ethnic group excluded
Source: ED-NMFISS, NMDOH

- The highest rates for BB/Pellet injuries were among Hispanics and Native Americans.
- Injuries to Native Americans may have been under reported in ED-NMFISS due to non-participation by many IHS facilities.

Injury Specifics

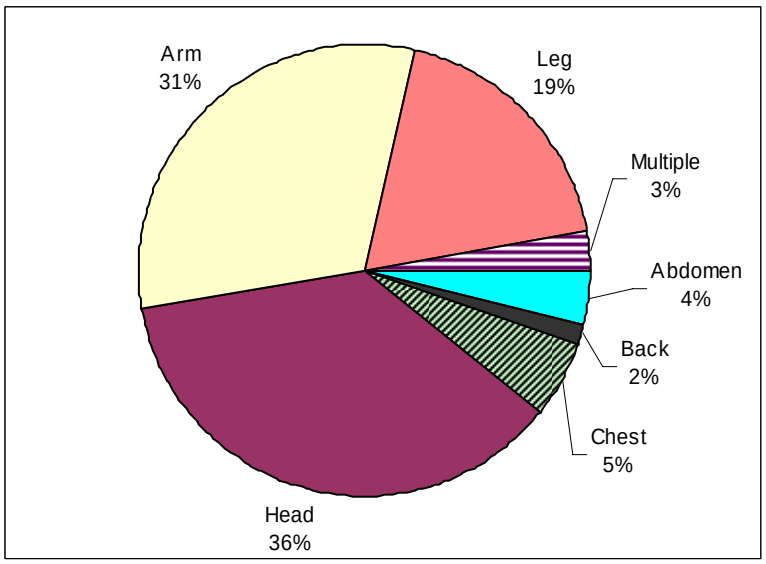
Figure 19. Average Annual BB/Pellet Injury Visits by Disposition, NM, 2002 - 2006



N=119 per year
Left AMA is "left against medical advice" reflecting people who left the ED before treatment was completed.
Source: ED-NMFISS, NMDOH

- 91% were discharged home.
- 45% of those admitted had injuries to the head.
- No fatalities were reported from BB/Pellet injuries.

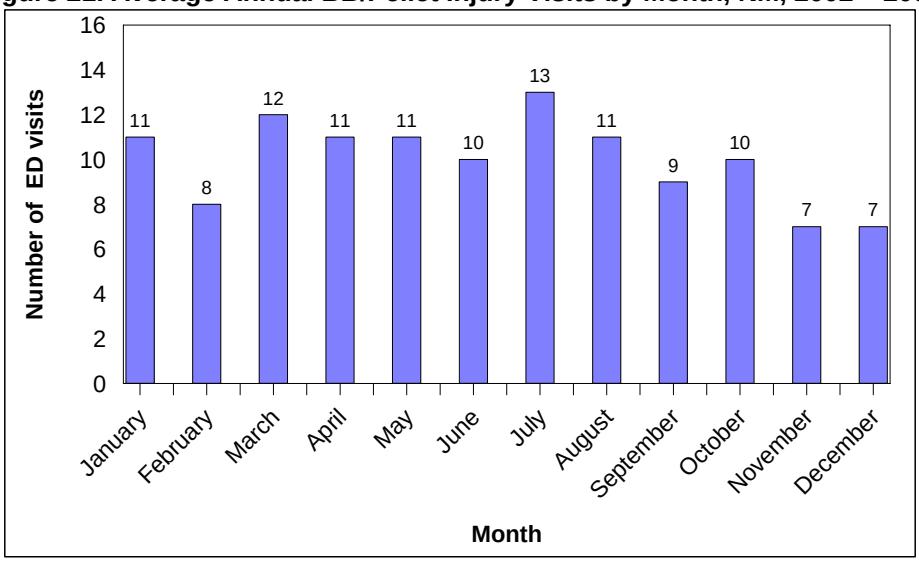
Figure 20. Average Annual BB/Pellet Injury Visits by Body Region, NM, 2002 - 2006



N=119 per year
Source: ED-NMFISS, NMDOH

- The largest share of BB/Pellet injuries seen in emergency departments were to the head (36%), the arm (31%) and the leg (19%), accounting for 86% of these ED visits.

Figure 21. Average Annual BB/Pellet Injury Visits by Month, NM, 2002 – 2006



N=119 per year
Source: ED-NMFISS, NMDOH

- BB and Pellet injuries were generally more common in the summer. January had a higher count than December, in contrast to firearms where January and December had similar numbers of injuries. Like firearms, BB/Pellet injuries were lower than in the adjacent months of February, June and September.

County of Residence

A map showing the rate of BB/Pellet injuries by county is on the next page.

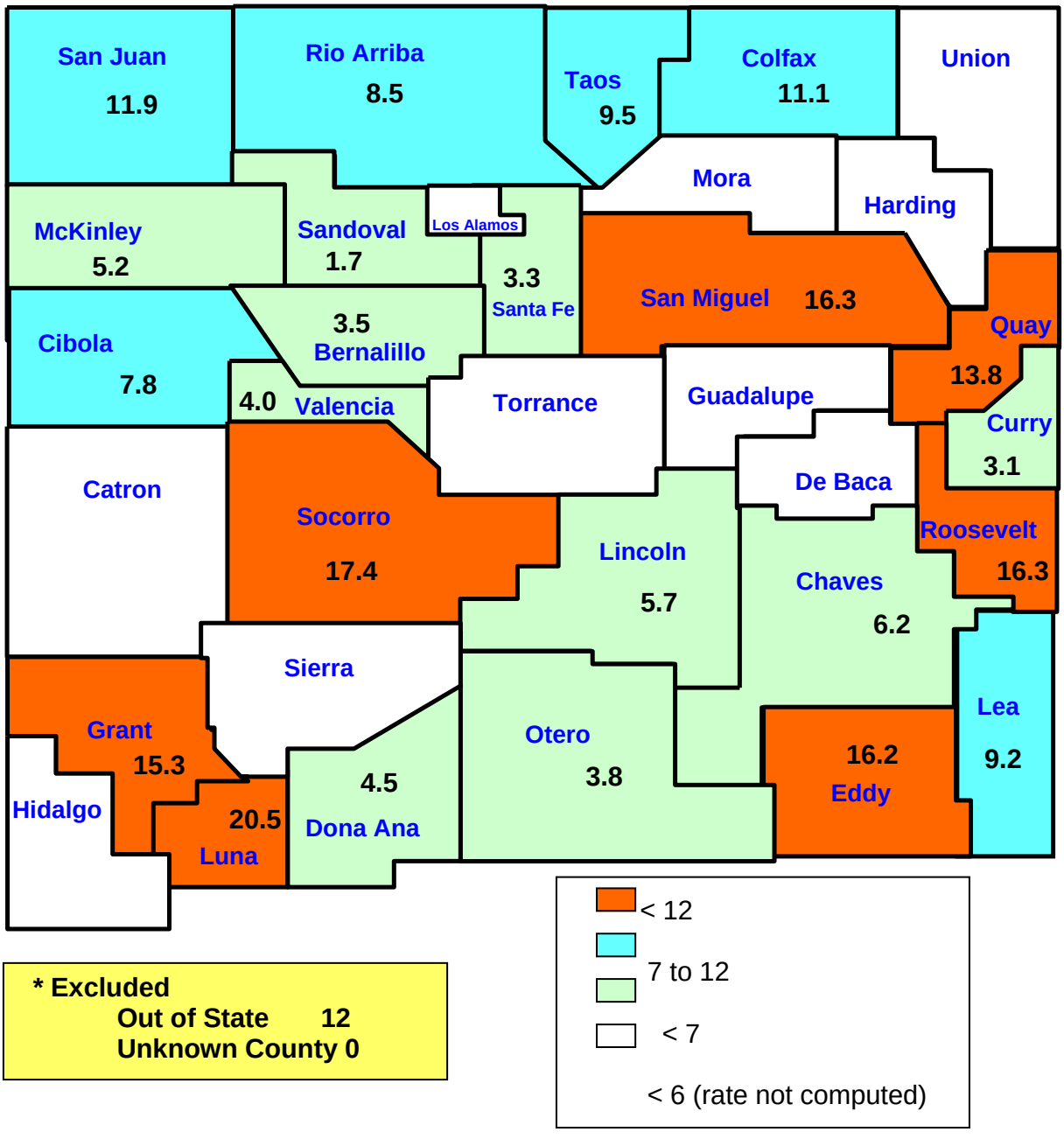
- The counties with the highest rates were scattered throughout the southern and eastern parts of the state.

Figure 22.

New Mexico Emergency Department BB/Pellet Injury

Rates per 100,000 population by County of Residence
2002 – 2006 New Mexico (N=581)*

New Mexico Rate 6.0

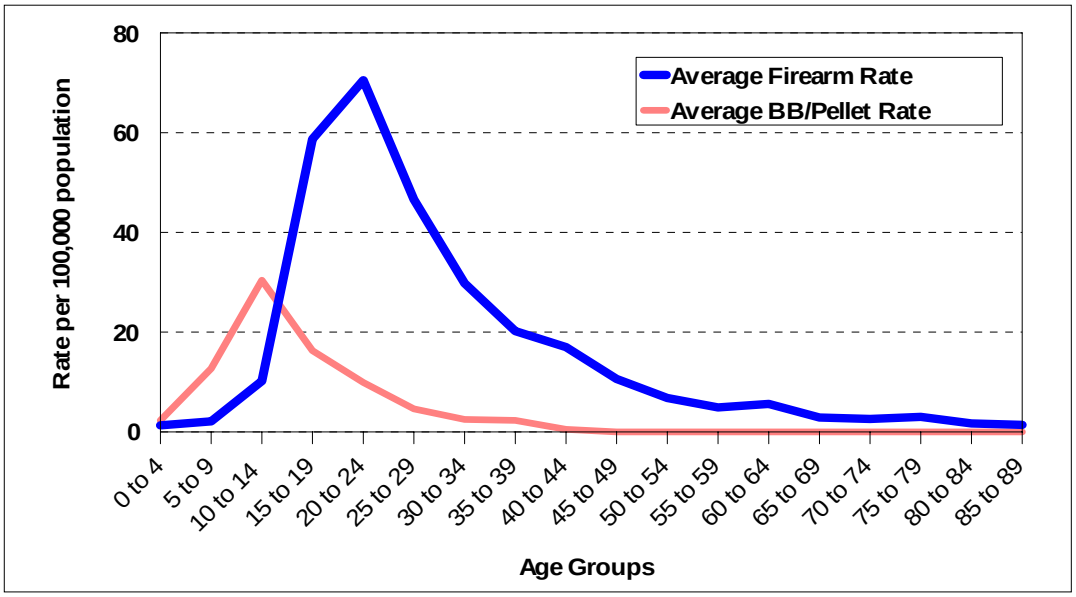


*** Excluded**
Out of State 12
Unknown County 0

Discussion

The most notable finding from ED-NMFISS was the contrasting age pattern for non-fatal gun-related injuries between firearms and BB /Pellet guns. The highest rates of firearm injury were among people 15 to 29 years, while BB/pellet injuries peaked in the 10 to 14 year age range (Figure 20). This contrast raises a question for further investigation: Do gun users have their first gun-handling experiences with BB/Pellet guns and then transition into using firearms?

Figure 23. Rates of Injury by Age for Firearms and BB/Pellet, NM, 2002 - 2006



Source: ED-NMFISS, NMDOH

For both firearm and BB/Pellet injuries, there were generally more injuries in the summer than in the winter, but February, June and September had lower numbers than the adjacent months. This pattern was not as strong for firearm injuries among people over 30 years of age, where there is little apparent seasonality.

Males accounted for 90% of firearm injury and 85% of BB/pellet injury.

With respect to race and ethnicity, the Hispanic category which accounted for 61% of the firearm injury visits, was a combination of those who report White race (78%) and those who report Other race (22%). The differences in race identification among Hispanics may indicate that it contains subgroups with substantial cultural differences that can impact approaches to preventing these injuries.

The highest rates for firearm injuries were in the southern part of the state, concentrated in Chaves, Eddy, Lea, Grant and Luna counties. Counties with relatively high rates for BB/pellet injuries were more widely dispersed.

Although Non-Hispanic whites made up 43% of New Mexico's population, they accounted for only 28% of both firearm and BB/pellet injury cases. Hispanics had high rates of injury from both firearms and BB/pellet guns. Native Americans had a high rate of BB/pellet injuries, but a relatively low rate of firearm injury. For Blacks, the situation was reversed, with a high rate of firearm injury and a low rate of BB/pellet injury.

Twenty-seven (27) individuals were identified who had more than one gun-related injury episode between 2002 and 2006. Each of these individuals had two injury incidents. Two of them were fatally injured in the second incident, which was reported to a NM ED. The time between injuries ranged from a few days to almost three years and averaged one year. Two-thirds of these individuals were Hispanic, 93% were male and 59% were between 15 and 29, which is much like the distribution of those with firearm injuries. Occurrences of multiple incidents of gun-related injuries to the same person merits further study.

For 13 of these individuals, both incidents involved firearm injuries. For 20 (74%) of these individuals, the same gun type (firearm, BB/pellet or other) was the source of injury in both incidents.

Table 2. Gun Types in Repeated Injuries, NM 2002 - 2006

Repeat Incidents		Second Incident		
		Firearm	BB/Pellet	Other
First Incident	Firearm	13	2	0
	BB/Pellet	3	4	0
	Other	1	1	3

Source: ED-NMFISS, NMDOH

Limitations

- In border areas where hospitals in other states are nearby, particularly along the southern and eastern borders with Texas, low numbers of reported firearm injuries in ED-NMFISS suggest that an unknown number of cases were sent to nearby Texas medical centers without first being seen at a New Mexico ED.
- Injuries from other gun-like instruments (Tasers, paintball guns, nail guns, etc.) and blunt trauma may have been under reported because ED staff may not have associated them with ED-NMFISS reporting.
- Time of arrival at ED is not currently collected.
- Firearm injuries among Native Americans were probably under reported, since not all IHS facilities reported.
- Information on the circumstances surrounding the injury, including intent (i.e., accident, self-inflicted suicide attempt, assault/homicide attempt) is not collected. However, intent was occasionally reported in the comment section. This data element was not included in the ED-NMFISS specifications because the system focuses on information that is readily and accurately available to ED staff.

References

1. WISQARS (Web-based Injury Query and Reporting System), Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control, 2001-2005 Injury Data, http://webappa.cdc.gov/sasweb/ncipc/nfirates2001.html (accessed 5/23/07)
2. WISQARS (Web-based Injury Query and Reporting System), Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control, 2000-2004 Mortality Data, http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html (accessed 6/15/2007)
3. WISQARS (Web-based Injury Query and Reporting System), Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control, 2000-2004 Mortality Data, http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html (accessed 8/25/2007)
4. Traffic Safety Facts 2005 Data Overview (DOT HS 810 623), National Highway Traffic Safety Administration, National Center for Statistics and Analysis, http://nrd-nhtsa.dot.gov/Pubs/810623.pdf (11/17/07)

Appendix 1

Methodology

ED-NMFISS Variables

From the outset limited surveillance data was designated for collection using a one-page paper form. ED-NMFISS collects these 14 data elements that depend only on information that an ED collects in its regular course of work, thereby making the collection relatively easy.

- 3 case identifier variables: Hospital name, Patient name, and Patient case number are only for internal management and are not included in any analyses.
- 1 time variable: Treatment Date is collected for both tracking cases and estimating the date of injury.
- 3 residence location variables: City, State and ZIP code of residence are used in combination to establish the patient's county of residence.
- 4 demographic variables: date of birth/age, gender, race, and ethnicity. Age at treatment is either provided or calculated from the birth date.
- 2 gun-related injury variables--Body Region Injured, Wound Type (to assess type of gun that caused the injury) are used to characterize the injury.
- ED Discharge Status is describes the outcome.

Each ED completes the ED-NMFISS form (see below) for every gun-related injury visit. The data may be submitted by mail, telephone (to an 800 case reporting number in the New Mexico Department of Health Epidemiology and Response Division, where the Office of Injury Prevention is based) or by FAX.

Injury Epidemiology Unit staff designed an electronic database in EpiInfo software and began using it with the first cases. The files are updated on a continuous basis as reports from the EDs arrive. Based on experience since ED-NMFISS began, the file management system has been modified; for example, adjustment needed to be made for cases with two records per incident, a situation that occurs when a patient is transferred from one NM ED to another or returns to an ED for further care after the initial visit.

Quality control procedures have been instituted in ED-NMFISS from the outset. The EpiInfo database is set up with checks on variables such as dates so that invalid entries are not accepted. Also the ED-NMFISS database manager maintains frequent communication with each ED contact person, and calls back whenever any field in the data form is not completed or somehow appears inconsistent. If an ED sends duplicate reports for the same patient and visit, these are checked against the original submission and then destroyed by shredding.

All EDs receive quarterly feedback reports on their case collection. Semi-annually each hospital receives a report on its own data including a table showing the completeness of reporting on each data element.
Of the data elements collected, almost all have non-missing values for 99% or more of the cases reported. The data items with the lowest completion rate are race and

ethnicity, which are often problematic as they may be ascertained in inconsistent ways across institutions. In general, the completeness of the cases reported has been improving over time, and is monitored regularly by DOH staff.

Table 3. Percent of cases with non-missing values for each data item, NM 2002 - 2006

Variable	2002	2003	2004	2005	2006	TOTAL
Hospital	100.0	100.0	100.0	100.0	100.0	100.0
Treatment date	100.0	100.0	100.0	100.0	99.8	99.9
Medical Record #	100.0	99.8	100.0	99.7	100.0	99.9
Patient Name	99.7	100.0	100.0	100.0	100.0	99.9
Date of Birth	97.8	98.9	100.0	99.7	99.8	99.2
Age	99.0	99.8	100.0	99.5	100.0	99.7
Gender	100.0	100.0	100.0	100.0	100.0	100.0
Race	94.6	96.2	98.4	98.3	98.6	97.2
Ethnicity	94.2	95.2	98.2	98.9	99.1	97.2
City	98.7	99.5	99.7	99.7	99.7	99.5
County	98.6	99.2	99.6	99.7	99.5	99.3
State	98.7	99.5	99.7	99.7	99.8	99.5
ZIP	96.2	98.6	99.6	99.4	99.3	98.6
Body Region	99.7	99.8	99.7	99.1	99.1	99.5
Wound Type	98.9	99.8	99.9	99.5	100.0	99.6
Discharge Status	99.5	99.5	99.7	99.8	99.8	99.7

N=3,165 ED visits reported to ED-NMFISS

ED-NMFISS Data Collection Form

Emergency Department—NM Firearm Injury Surveillance System [ED-NMFISS]

PASTE PATIENT ID LABEL HERE

If you attach the patient label, do not re-enter any information that is on the label (For example the "*" items below.)

1. **Hospital/facility name** _____

2. ***Treatment Date:** _____/_____/_____
Month Day 4-digit Year

3. ***Medical Record Number** _____

4. ***Patient's Name:** (*Last, First, Middle initial*) _____

5. ***Birthdate:** _____/_____/_____ OR Age ___ Unknown ☐
Month Day 4-digit Year

6. City of Residence *(Do not enter post office box or rural route)*: _____ Unknown ☐

7. State of Residence: _____ Unknown ☐

8. ZIPcode _____ Unknown ☐

9. Gender Male ☐ Female ☐ Unknown ☐	**12.** Body Region(s) Injured (*Check all that apply*): Abdomen/pelvis ☐ Back ☐ Chest ☐ Head/neck ☐ Arm/hand ☐ Leg/foot ☐ Unknown ☐
10. Race White ☐ Black ☐ Native American ☐ Asian/Pacific Islander ☐ Other ☐ Unknown ☐	**13.** Firearm Wound Type (*Check all that apply*): Bullet ☐ BB ☐ Pellet ☐ Shotgun ☐ Blunt trauma with gun (e.g.pistol-whipped) ☐ Other*_____ ☐ Unknown ☐
11. Ethnicity Hispanic ☐ Non-Hispanic ☐ Unknown ☐	**14.** ED Discharge Status: Home/self ☐ Hospitalized ☐ Left-AMA ☐ Dies in Ed ☐ DOA at ED ☐ Status Post ☐ Transferred to_____ ☐ Unknown ☐

Comments:_____

* Write in other situations that appear to be firearm related, (e.g., paint ball, taser gun, collateral from drive by).

SUBMIT directly by

MAIL to: ED-NMFISS, Office of Epidemiology, New Mexico Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110
OR
TELEPHONE to the answering machine **1-800-432-4404** and **READ IN** data, stating item and then patient facts.

Have any questions? Please call Isaac Romero (505) 827-2724, or Barbara Chatterjee (505) 827-2726. All data you submit is treated as confidential. ***PLEASE SUBMIT DATA WITHIN 4 DAYS OF ED VISIT.***
Thank you for providing these data. *N:\FIREARM\ED data form 24.doc 12/06/2007*

Appendix 2

Utilization of EDs

The total load of gun-related injuries on New Mexico Emergency Departments is made up of initial visits, transfers-in and secondary visits. Each year, on average, New Mexico emergency departments saw the following distribution of gun-related injuries: 597 initial visits, 30 cases transferred-in from another NM ED, and 6 secondary or follow-up visits that were not due to a direct transfer. In total an average of 633 gun-related injury visits to New Mexico emergency departments occurred each year, an indication of the amount of ED resources expended for these injuries.

Additionally, 45 transfers per year did not meet the ED visit criterion for ED-NMFISS reporting and were not tracked in the system. These included in an average year, 37 transfers to out of state emergency departments, almost all of them to El Paso or Lubbock Texas. Another 8 transfers per year were not seen in emergency departments, either because they bypassed the ED at the second hospital, or they were sent to different types of facilities.

Appendix 3

Detailed Data Tables for Firearm Injury Emergency Department Visits

Cells with fewer than 6 cases are suppressed and replaced by an *

Table A. Type of Firearm, NM, 2002-2006

Type of Firearm	2002	2003	2004	2005	2006	TOTAL	Annual Average
Bullet	388	374	386	390	348	1886	377
Shotgun	32	34	17	16	23	122	24
Total	420	408	403	406	371	2008	402

Table B. Gender of Firearm Injury ED Visits, NM, 2002-2006

Gender	2002	2003	2004	2005	2006	TOTAL	Annual Average
Male	371	364	360	358	347	1800	360
Female	49	44	43	48	24	208	42
Total	420	408	403	406	371	2008	402

Table C. Age Group of Firearm Injury ED Visits, NM, 2002-2004

Age Group	2002	2003	2004	2005	2006	TOTAL	Annual Average
0 to 4	*	*	*	*	*	9	2
5 to 9	*	*	*	*	*	14	3
10 to 14	18	14	10	15	15	72	14
15 to 19	93	94	83	93	83	446	89
20 to 24	115	101	116	106	97	535	107
25 to 29	53	57	64	63	55	292	58
30 to 34	44	41	34	27	30	176	35
35 to 39	26	27	22	28	21	124	25
40 to 44	19	26	29	30	20	124	25
45 to 49	19	19	12	14	15	79	16
50 to 54	6	9	12	8	12	47	9
55 to 59	7	6	*	*	7	30	6
60 to 64	*	*	*	*	7	26	5
65 to 69	*	*	*	*	*	10	2
70 to 74	*	*	*	*	*	8	2
75 to 79	*	*	*	*	*	7	1
80 to 84	*	*	*	*	*	*	1
85 to 89	*	*	*	*	*	*	0
unknown	*	*	*	*	*	*	1
TOTAL	420	408	403	406	371	2008	402

Table D. Age group of Male Firearm Injury ED Visits, NM, 2002-2006

Age Group	2002	2003	2004	2005	2006	TOTAL
0 to 4	*	*	*	*	*	*
5 to 9	*	*	*	*	*	10
10 to 14	16	10	10	14	14	64
15 to 19	78	82	73	86	78	397
20 to 24	107	93	98	90	90	478
25 to 29	50	52	58	61	50	271
30 to 34	40	33	33	22	29	157
35 to 39	22	26	21	22	19	110
40 to 44	17	23	26	27	20	113
45 to 49	13	17	11	13	15	69
50 to 54	*	8	12	8	11	44
55 to 59	6	6	*	*	6	27
60 to 64	*	*	*	*	6	22
65 to 69	*	*	*	*	*	9
70 to 74	*	*	*	*	*	8
75 to 79	*	*	*	*	*	7
80 to 84	*	*	*	*	*	*
85 to 89	*	*	*	*	*	*
unknown	*	*	*	*	*	*
TOTAL	371	364	360	358	347	1800

Table E. Age Groups of Female Firearm Injury ED Visits, NM, 2002-2006

Age Group	2002	2003	2004	2005	2006	TOTAL
0 to 4	*	*	*	*	*	*
5 to 9	*	*	*	*	*	*
10 to 14	*	*	*	*	*	8
15 to 19	15	12	10	7	*	49
20 to 24	8	8	18	16	7	57
25 to 29	*	*	6	*	*	21
30 to 34	*	8	*	*	*	19
35 to 39	*	*	*	6	*	14
40 to 44	*	*	*	*	*	11
45 to 49	6	*	*	*	*	10
50 to 54	*	*	*	*	*	*
55 to 59	*	*	*	*	*	*
60 to 64	*	*	*	*	*	*
65 to 69	*	*	*	*	*	*
70 to 74	*	*	*	*	*	*
75 to 79	*	*	*	*	*	*
80 to 84	*	*	*	*	*	*
85 to 89	*	*	*	*	*	*
unknown	*	*	*	*	*	*
TOTAL	49	44	43	48	24	208

Table F. Race-Ethnicity of Firearm Injury ED Visits, NM, 2002-2006

Race-Ethnicity	2002	2003	2004	2005	2006	TOTAL	Annual Average
White non-Hispanic	107	121	105	108	123	564	113
Hispanic	257	223	260	241	206	1187	237
Black/Asian	11	24	15	21	16	87	17
Native American	30	20	19	27	20	116	23
Unknown	15	20	*	9	6	54	11
TOTAL	420	408	403	406	371	2008	402

Table G. Body Region Injured for Firearm Injury ED Visits, NM, 2002-2006

Body Region	2002	2003	2004	2005	2006	TOTAL	Annual Average
Abdomen	43	47	48	44	35	217	43
Back	15	13	8	16	7	59	12
Chest	42	35	33	28	27	165	33
Head	73	65	66	59	61	324	65
Arm	73	66	77	89	82	387	77
Leg	132	135	130	133	129	659	132
Multiple	40	46	41	36	29	192	38
TOTAL	420	408	403	406	371	2008	402

Note: During this period 5 visits did not have any body region recorded.

Table H. Body Region Injured for Firearm Injury ED Visits Admitted or Transferred, NM, 2002 - 2006

Body Region	2002	2003	2004	2005	2006	TOTAL	Annual Average
Abdomen	30	34	39	34	27	164	33
Back	9	10	*	11	*	37	7
Chest	36	26	29	22	20	133	27
Head	53	39	40	42	39	213	43
Arm	22	30	29	33	24	138	28
Leg	47	49	49	45	42	232	46
Multiple	28	30	28	32	18	136	27
TOTAL	225	218	217	219	174	1053	211

Table I. Body Region Injured for Firearm Injury ED Visits Released Home, NM, 2002-2006

Body Region	2002	2003	2004	2005	2006	TOTAL	Annual Average
Missing	*	*	*	*	*	*	1
Abdomen	13	13	9	10	7	52	10
Back	6	*	*	*	*	21	4
Chest	6	9	*	6	7	31	6
Head	20	26	26	16	22	110	22
Arm	49	36	48	52	55	240	48
Leg	83	80	80	84	85	412	82
Multiple	12	16	12	*	10	54	11
TOTAL	191	184	183	177	189	924	185

Table J. Number of Body Regions Injured for Firearm Injury ED Visits, NM, 2002-2006

Number of Regions	2002	2003	2004	2005	2006	TOTAL	Annual Average
One	378	361	362	369	342	1812	362
Two	28	41	30	21	24	144	29
3 or more	12	*	11	15	*	47	9
Unknown	*	*	*	*	*	*	1
TOTAL	420	408	403	406	371	2008	402

Table K. Body Regions Injured by Age Group for Firearm Injury ED Visits, NM, 2002-2006

age group	Missing	Abdomen	Back	Chest	Head	Arm	Leg	Multiple
15-29 years	2	128	42	103	201	238	438	121
15-29 %		10.1%	3.3%	8.1%	15.8%	18.7%	34.4%	9.5%
30+ years	3	77	13	59	102	133	187	62
30+%		12.1%	2.0%	9.3%	16.0%	20.9%	29.4%	9.7%

Table L. ED Discharge Status for Firearm Injury ED Visits, NM, 2002-2006

Final Status	2002	2003	2004	2005	2006	TOTAL	Annual Average
Released Home	191	184	183	177	189	924	185
Admitted	190	169	186	171	139	855	171
Left AMA	*	6	*	10	8	31	6
Transferred	35	49	31	48	35	198	40
TOTAL	420	408	403	406	371	2008	402

Note: In addition in this period the EDs saw 160 deaths, all from firearm injuries.

Table M. Month of Treatment for Firearm Injury ED Visits, NM, 2002-2006

Month	2002	2003	2004	2005	2006	TOTAL	Annual Average
January	27	31	41	32	25	156	31
February	30	15	34	22	28	129	26
March	38	45	28	33	30	174	35
April	42	39	29	32	38	180	36
May	32	42	45	38	31	188	38
June	28	27	27	28	34	144	29
July	48	33	39	40	37	197	39
August	40	41	36	46	38	201	40
September	33	36	26	28	28	151	30
October	42	29	43	33	30	177	35
November	28	36	29	35	25	153	31
December	32	34	26	39	27	158	32
TOTAL	420	408	403	406	371	2008	402

Table N. Month of Treatment by Age Group for Firearm Injury ED Visits, NM, 2002-2006

	Age Group	
month	15-29	30+
January	19	10
February	16	8
March	22	11
April	23	11
May	25	11
June	19	8
July	27	11
August	25	14
September	17	11
October	22	12
November	21	9
December	19	11
TOTAL	255	127

Table O. County of Residence for Firearm Injury ED Visits, NM, 2002-2006

COUNTY	2002	2003	2004	2005	2006	TOTAL	Annual Average
BERNALILLO	167	136	165	154	141	763	153
CATRON	*	*	*	*	*	*	1
CHAVES	43	41	39	28	25	176	35
CIBOLA	6	8	9	*	7	34	7
COLFAX	*	*	*	*	*	7	1
CURRY	13	11	11	14	9	58	12
DEBACA	*	*	*	*	*	*	0
DONA ANA	7	12	7	12	18	56	11
EDDY	15	15	11	16	16	73	15
GRANT	6	11	6	13	10	46	9
GUADALUPE	*	*	*	*	*	6	1
HARDING	*	*	*	*	*	*	0
HIDALGO	*	*	*	*	*	*	0
LEA	9	18	22	26	25	100	20
LINCOLN	*	*	*	*	*	13	3
LOS ALAMOS	*	*	*	*	*	*	1
LUNA	*	8	10	10	6	39	8
MCKINLEY	*	7	*	6	*	28	6
MORA	*	*	*	*	*	*	0
OTERO	11	7	*	*	6	31	6
QUAY	*	*	*	*	*	*	1
RIO ARRIBA	*	13	13	12	8	48	10
ROOSEVELT	*	6	*	*	*	10	2
SANDOVAL	14	17	8	11	10	60	12
SAN JUAN	11	22	14	27	13	87	17
SAN MIGUEL	7	11	*	9	9	39	8
SANTA FE	29	12	14	10	16	81	16
SIERRA	*	*	*	*	*	9	2
SOCORRO	11	*	*	*	*	21	4
TAOS	*	6	7	*	8	30	6
TORRANCE	*	*	*	*	*	16	3
UNION	*	*	*	*	*	*	0
VALENCIA	18	14	21	12	10	75	15
NM TOTAL	394	388	389	392	362	1925	385
Out of State	22	19	13	13	9	76	15
Unknown	4	1	1	1	0	7	1
All Incidents Total	420	408	403	406	371	2008	402

Appendix 4

Detailed Data Tables for BB/Pellet Injury Emergency Department Visits

Cells with fewer than 6 cases are suppressed (replaced by *)

Table P. Type of Air Gun for BB/Pellet Injury ED Visits, NM, 2002-2006

BB or Pellet gun	2002	2003	2004	2005	2006	TOTAL	Annual Average
BB	73	84	94	90	94	435	87
Pellet	31	29	37	38	23	158	32
Total	104	113	131	128	117	593	119

Table Q. Gender of BB/Pellet Injury ED Visits, NM, 2002-2006

Gender	2002	2003	2004	2005	2006	TOTAL	Annual Average
Male	93	99	112	102	100	506	101
Female	11	14	19	26	17	87	17
TOTAL	104	113	131	128	117	593	119

Table R. Age Group of BB/Pellet Injury ED Visits, NM, 2002-2006

Age Group	2002	2003	2004	2005	2006	TOTAL	Annual Average
0 to 4	*	*	*	*	6	16	3
5 to 9	8	23	18	17	17	83	17
10 to 14	40	39	55	43	38	215	43
15 to 19	25	23	26	25	25	124	25
20 to 24	11	15	15	16	18	75	15
25 to 29	6	*	*	9	6	29	6
30 to 34	*	*	*	*	*	15	3
35 to 39	*	*	6	*	*	14	3
40+	7	*	*	7	*	22	4
TOTAL	104	113	131	128	117	593	119

Table S. Ethnicity of BB/Pellet Injury ED Visits, NM, 2002-2006

Ethnicity	2002	2003	2004	2005	2006	TOTAL	Annual Average
White non-Hispanic	33	28	34	42	30	167	33
Hispanic	55	59	74	68	62	318	64
Black	*	*	*	*	*	*	1
Native American	6	25	18	17	20	86	17
Asian	*	*	*	*	*	*	0
Unknown	9	*	*	*	*	18	4
TOTAL	104	113	131	128	117	593	119

Table T. Body Region Injured of BB/Pellet Injury ED Visits, NM, 2002-2006

Body Region	2002	2003	2004	2005	2006	TOTAL	Annual Average
Missing	*	*	*	*	*	*	0
Abdomen	6	*	8	*	*	23	5
Back	*	*	0	*	*	9	2
Chest	*	6	6	8	7	32	6
Head	37	37	46	49	47	216	43
Arm	31	37	43	40	35	186	37
Leg	20	23	26	20	21	110	22
Multiple	*	*	*	*	*	16	3
TOTAL	104	113	131	128	117	593	119

Table U. ED Discharge Status of BB/Pellet Injury ED Visits, NM, 2002-2006

Final ED Status	2002	2003	2004	2005	2006	TOTAL	Annual Average
Released Home	94	104	118	119	107	542	108
Admitted	10	6	*	*	*	29	6
Left AMA	*	*	*	*	*	6	1
Transferred	*	*	7	*	*	15	3
Unknown	*	*	*	*	*	*	0
TOTAL	104	114	131	128	117	594	119

Table V. Month of Treatment of BB/Pellet Injury ED Visits, NM, 2002-2006

Month	2002	2003	2004	2005	2006	TOTAL	Annual Average
January	6	12	15	16	*	54	11
February	6	8	8	*	11	38	8
March	10	10	12	12	15	59	12
April	8	10	14	12	9	53	11
May	13	12	10	8	13	56	11
June	*	8	15	14	9	50	10
July	*	8	13	18	21	64	13
August	12	10	9	11	13	55	11
September	10	8	13	10	*	45	9
October	15	12	11	7	6	51	10
November	7	10	*	6	*	33	7
December	9	*	6	9	6	35	7
TOTAL	104	113	131	128	117	593	119

Table W. County of Residence of BB/Pellet Injury ED Visits, NM, 2002-2006

County	2002	2003	2004	2005	2006	TOTAL	Annual Average
BERNALILLO	26	17	30	25	8	106	21
CATRON	*	*	*	*	*	*	0
CHAVES	*	*	*	6	*	19	4
CIBOLA	*	*	*	*	*	11	2
COLFAX	*	*	*	*	*	8	2
CURRY	*	*	*	*	*	7	1
DEBACA	*	*	*	*	*	*	0
DONA ANA	6	9	13	*	9	42	8
EDDY	9	7	13	*	8	42	8
GRANT	6	*	*	6	*	24	5
GUADALUPE	*	*	*	*	*	*	0
HARDING	*	*	*	*	*	*	0
HIDALGO	*	*	*	*	*	*	0
LEA	*	6	*	9	*	26	5
LINCOLN	*	*	*	*	*	6	1
LOS ALAMOS	*	*	*	*	*	*	0
LUNA	*	*	*	9	7	27	5
MCKINLEY	*	*	*	*	*	20	4
MORA	*	*	*	*	*	*	1
OTERO	*	*	*	*	*	12	2
QUAY	*	*	*	*	*	7	1
RIO ARRIBA	*	7	*	*	*	18	4
ROOSEVELT	*	*	*	*	*	15	3
SANDOVAL	*	*	*	*	*	9	2
SAN JUAN	9	19	14	17	15	74	15
SAN MIGUEL	*	*	7	6	7	25	5
SANTA FE	*	7	*	*	*	23	5
SIERRA	*	*	*	*	*	*	0
SOCORRO	6	*	*	*	*	16	3
TAOS	*	*	*	6	*	15	3
TORRANCE	*	*	*	*	*	*	1
UNION	*	*	*	*	*	*	0
VALENCIA	*	*	*	*	*	14	3
NM TOTAL	102	108	131	127	113	581	116
Out of State	2	5	0	1	4	12	2
Unknown	0	0	0	0	0	0	0
All Incidents Total	104	113	131	128	117	593	119

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New Mexico Department of Health

Epidemiology and Response Division

Injury and Behavioral Health Bureau

Office of Injury Prevention

Copies available on website: http://www.health.state.nm.us/epi/hdata.html
(Click on “injury” in upper left Data Menu)