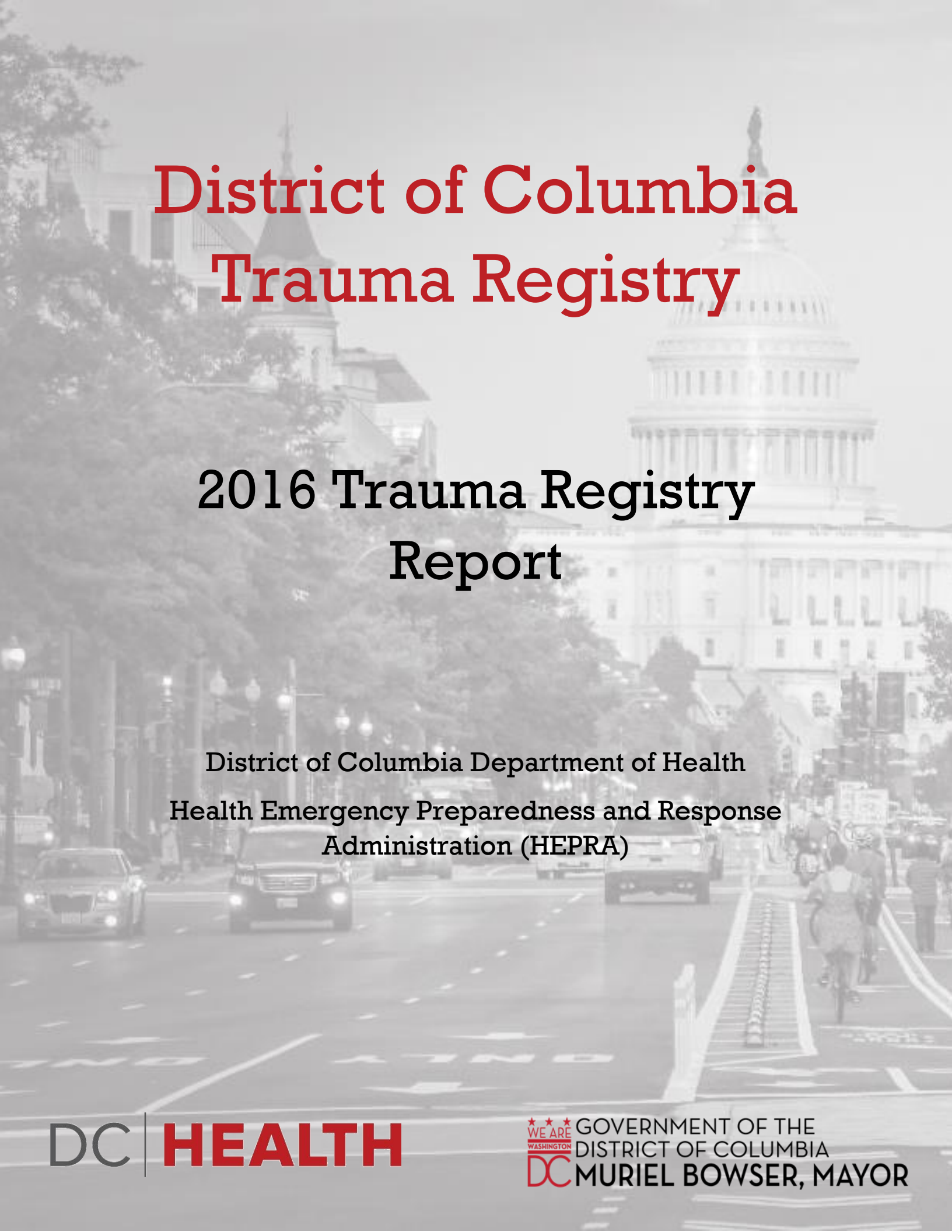

District of Columbia Trauma Registry

2016 Trauma Registry Report

District of Columbia Department of Health

Health Emergency Preparedness and Response Administration (HEPRA)

DC | HEALTH

GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

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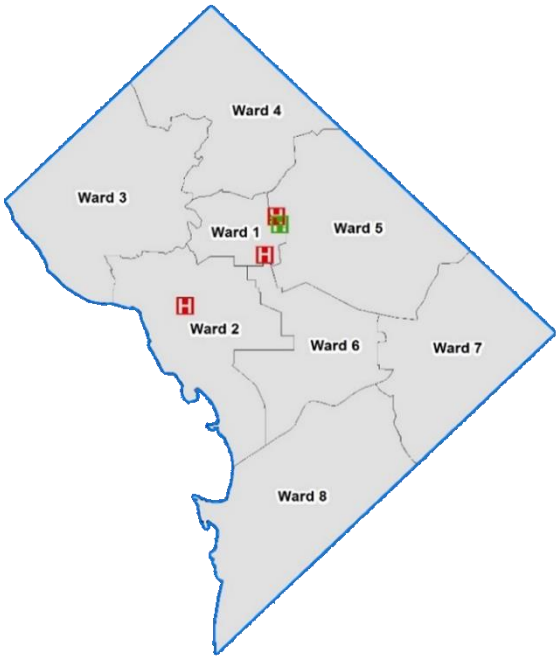
Introduction to the DC Trauma Registry

The District of Columbia Department of Health (DC Health) 2016 Trauma Registry Report is the first report of its kind to describe trauma care within the District of Columbia. In compliance with the Emergency Medical Services (EMS) Act of 2008, DC Health began utilizing the recommendations outlined by the American College of Surgeons (ACS) Committee on Trauma to designate trauma facilities in the District of Columbia. As part of the certification process, trauma facilities are required to submit their de-identified data to the National Trauma Data Bank (NTDB) which is the largest repository of United States trauma data ever assembled.[1] Additionally, these data are also submitted to DC Health via an online submission tool. As part of the credentialing process, trauma centers began submitting their data to DC Health in 2016.

Figure 1 Map of the four level-one trauma facilities in the District of Columbia



In the District of Columbia, there are four (4) facilities which have earned a trauma accreditation from the American College of Surgeons:

Level One Pediatric Trauma Center (Green)

Children's National Health System

Level One Adult Trauma Center (Red)

George Washington University Hospital

Howard University Hospital

MedStar Washington Hospital Center

In addition to the four trauma facilities, there are also four other acute care facilities, with emergency departments (ED), within the District of Columbia; however, they do not submit trauma data. The State of Maryland and the Commonwealth of Virginia also accredit trauma facilities which are situated regionally but not represented in this trauma report.

The analytics found within this report detail the demographics, injuries, outcomes, and trends associated with each of these trauma cases contained within the Registry. Due to the recent activation of the DC Trauma Registry, there is not sufficient longitudinal data to conduct yearly comparisons. The Health Emergency Preparedness and Response Administration works on behalf of DC Health to collaborate with each of these critical healthcare partners to better understand trauma and injuries within the District of Columbia. The mission of DC Health is to promote health, wellness and equity across the District, and protect the safety of residents, visitors and those doing business in our nation's Capital.

[1] https://www.facs.org/quality-programs/trauma/ntdb

Executive Summary

In 2016, there were 6,039 reported trauma cases that were treated by physicians at the four level one trauma facilities in the District of Columbia. The cases included in this registry represent individuals who experienced a variety of injuries as a result of a traumatic event such as a motor vehicle crash, stabbing, shooting, burn, or a fall. The overall case-fatality ratio per 100 persons, which is the number of deaths of trauma patients divided by the total number of trauma patients and then multiplied by 100, in the District of Columbia was 2.7 versus the national ratio of 4.4.[2]

Over half (57%) of the trauma cases treated within the District of Columbia were patients who sustained their injuries within the District. The remaining 43% of cases treated within the District were injured in surrounding states or the location of where the injury occurred was not reported as part of the trauma record. The majority of all trauma cases presented to the emergency department via ambulance (80.3%), and the remaining cases were primarily transported via personal vehicle or air ambulance (helicopter).

Two of the largest payers billed for provided trauma care were Medicaid and private insurance. Over 15% of the patients treated during 2016 reported that they were self-pay and/or did not have their insurance provider billed for the care that they received.

Demographic data regarding age and gender were similar to data seen across the United States with the majority of patients being male for most age brackets; however, after 75 years of age, female trauma patients were more common. This is consistent with 2012-2016 American Community Survey Five-Year Estimates which show there are more females 70-89 years of age in the District of Columbia.[3]

The most injuries resulted from blunt force trauma, which were most frequently the result of falls or being struck by an object. Approximately 35% of all trauma cases in the District of Columbia were a result of a fall. In contrast, those individuals who suffered a penetrating trauma were most likely to have been injured by a firearm. Firearm injuries represented 8.7% of all trauma cases in 2016, but constituted almost 32% percent of the deaths resulting from trauma.

Generally, the District of Columbia experienced lower percentages of specific complications as compared to national averages; however, further analysis is warranted to determine what trauma facilities are documenting as “other” regarding complications.

The data suggest that trauma patients are spending a significant amount of time in the emergency department before being moved to other parts of a hospital, with a median time of 209 minutes. Patients waiting to go to the operating room had a median wait time of 95 minutes.

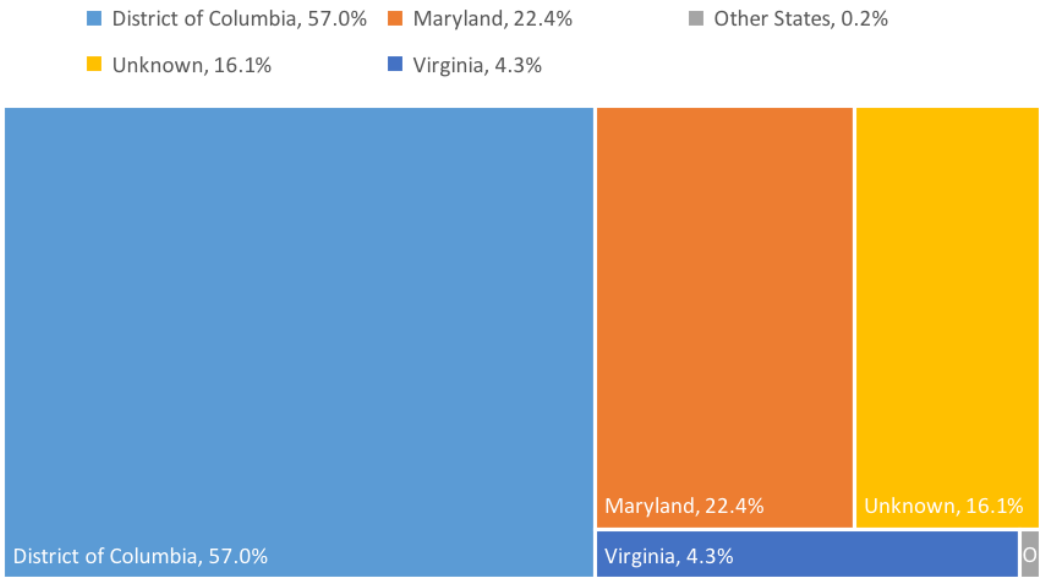
[2] National Trauma Data Bank Annual Report 2016, American College of Surgeons
[3] U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Trauma Case Demographics

In 2016, there were 6,039 trauma cases that presented to the four trauma facilities throughout the District of Columbia. The graphs and tables outlined in this section are intended to provide greater insight into the demographics of those individuals evaluated and treated within the District's trauma system.

Not all of the patients treated in the District were injured in the District; in fact, 57% of trauma patients were reported to have been injured within the District. Approximately 27% of patients were reportedly injured in Maryland or Virginia. Unfortunately, there were some individuals for which it was not possible to ascertain the geographic location of injury – their injury location was reported as "Unknown" in the figure below.

Figure 2 Trauma cases treated in the District of Columbia in 2016 by State of Where the Injury Occurred, N=6,039



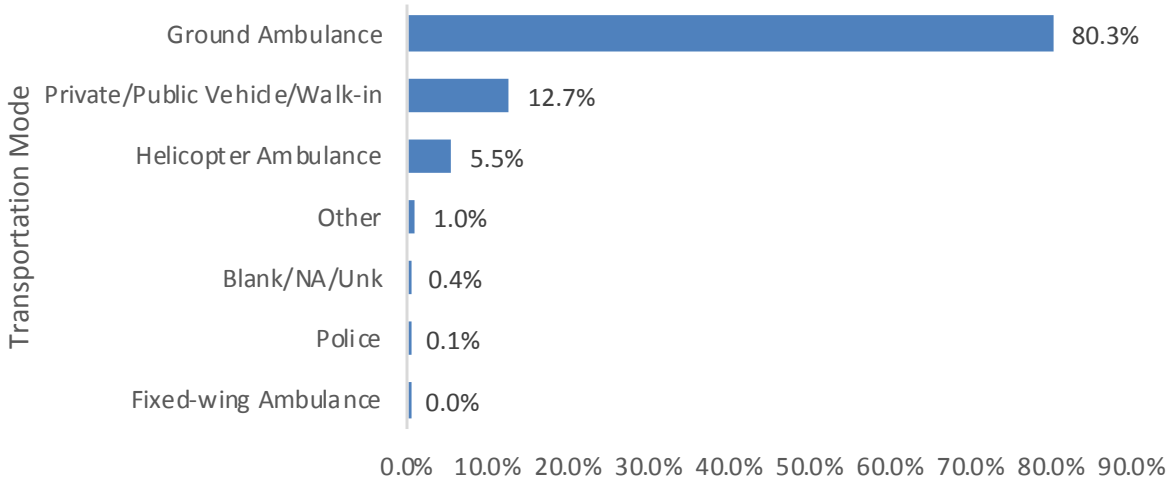
Source: DC Trauma Registry, HEPRA, DC Health

A select few patients originated from "other states" including West Virginia, Delaware, and Texas. Some of these patients may have been transferred from a tertiary hospital in the region that did not have the same capabilities as facilities within the District. The figure above highlights how District of Columbia trauma facilities support the region in delivery of care for traumatic injuries.

The trauma record also includes the mode of transportation in which trauma patients enter their facility. In 2016, over 80% of the trauma cases presented to the emergency department via ground ambulance. Almost 13% of the cases presented to the emergency departments by private vehicle or public transit. This category includes personal vehicles, taxis, and ride sharing vehicles from companies such as Lyft and Uber. Due to the small geographical footprint of the District of Columbia, it is rare for a helicopter (5.5%) to transfer a patient from the scene of an incident within the District to a trauma facility. The majority of

the cases transported by aircraft originated from other states and/or outlying hospitals that did not have the capacity to treat the patient.

Figure 3 Transportation Mode to the Trauma Facilities for the District of Columbia in 2016, N=6,039

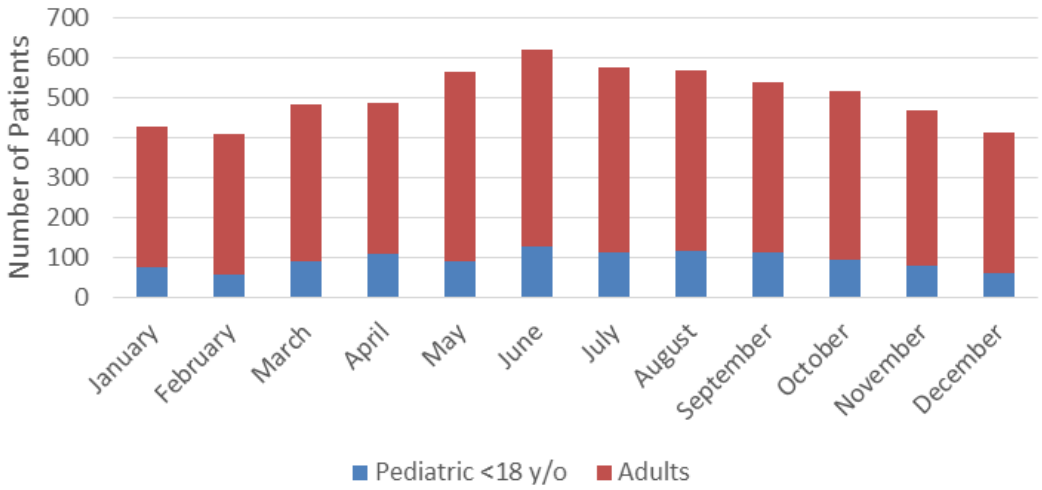


Source: DC Trauma Registry, HEPRA, DC Health

Fixed-wing ambulances transport patients that were being transferred into the District of Columbia for highly specialized care that could not be found elsewhere or due to extenuating circumstances that required the patient to be transferred to the District.

Figure 4 summarizes the distribution of cases by month. Based on the graph, there appears to be a higher patient load in late spring and summer compared to the rest of the year.

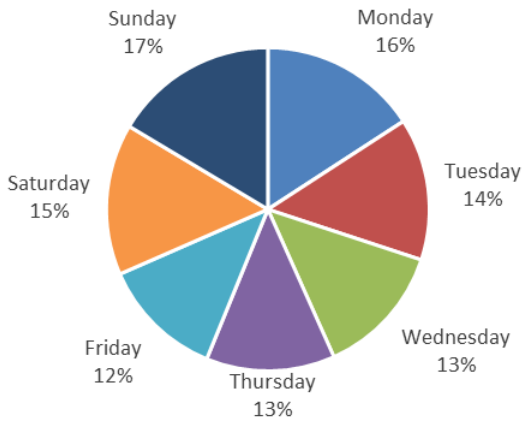
Figure 4 Distribution of Trauma Patients by Month in the District of Columbia (2016)



Source: DC Trauma Registry, HEPRA, DC Health

Figure 5 displays the distribution of cases by the day of the week that they present to the emergency department. The number of cases seen by trauma facilities did not differ by the day of the week (0.05 significance level).

Figure 5 Trauma Cases in the District of Columbia by Day of Week (2016)

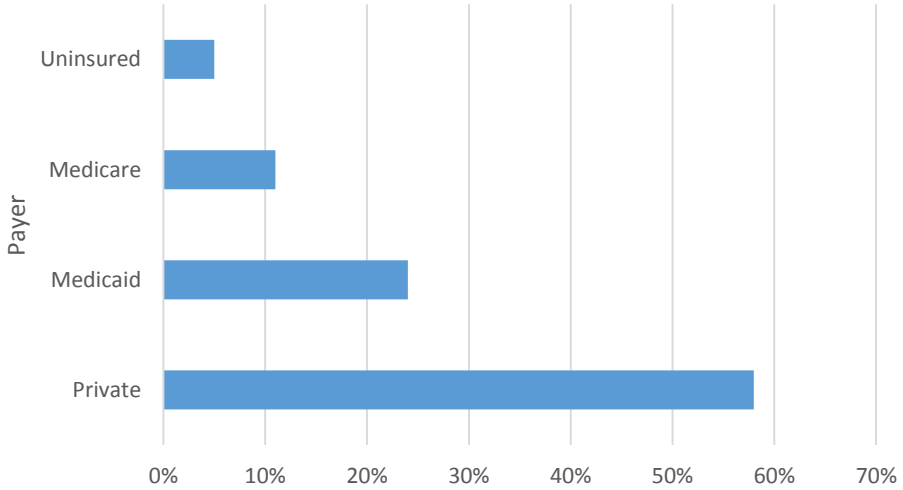


Source: DC Trauma Registry, HEPRA, DC Health

Payer Mix

In 2016, the Kaiser Family Foundation estimated that 5% of the population living in the District of Columbia was uninsured. The majority of residents subscribed to private insurance on an individual basis or through their employer. Medicare and Medicaid programs accounted for 35% of the payer mix in DC in 2016.[4] Figure 6 represents the estimated payer mix for the District of Columbia in 2016 based on the Kaiser Family Foundation's State Health Facts.

Figure 6 DC Insurance Payer Mix Estimations for 2016



Source: The Kaiser Family Foundation's State Health Facts, Census Bureau's March Current Population Survey (CPS: Annual Social and Economic Supplements), 2014-2017.

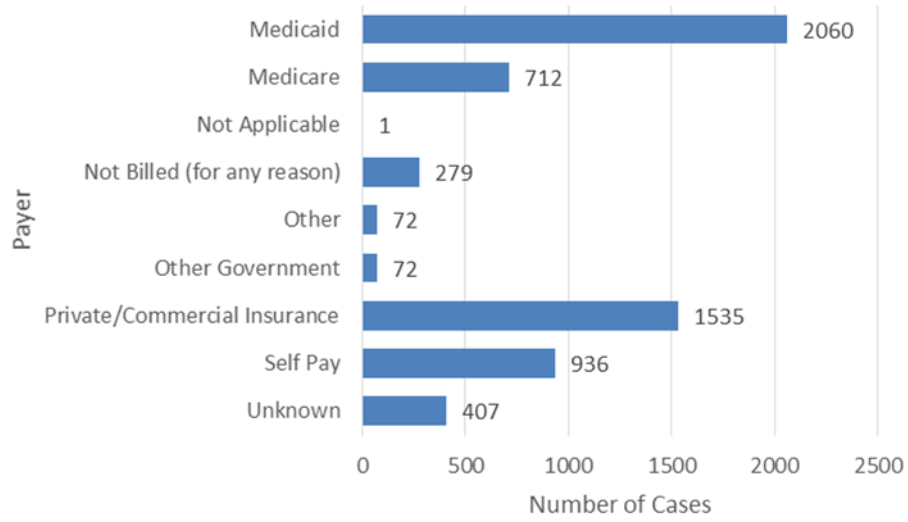
The trauma registry collects payer data on each trauma case; payer mix provides insight into the socioeconomic status of trauma patients. It should be noted that the payer mix from the 2016 trauma cases represents all of the patients who were seen in the District of Columbia

[4] The Kaiser Family Foundation's State Health Facts, Census Bureau's March Current Population Survey (CPS: Annual Social and Economic Supplements, 2014-2017.

including those who were transported from other states, which may have different insurance payer mixes (see Figure 7). The insurance data from the registry can be seen graphically in the figure below.

Approximately 15% of the cases seen in the District of Columbia were reported as self-pay. These patients were billed for the entirety of their trauma services and did not file their visit against any form of insurance prior to the submission of the trauma record.

Figure 7 Payer Mix for Trauma Cases in the District of Columbia (2016)

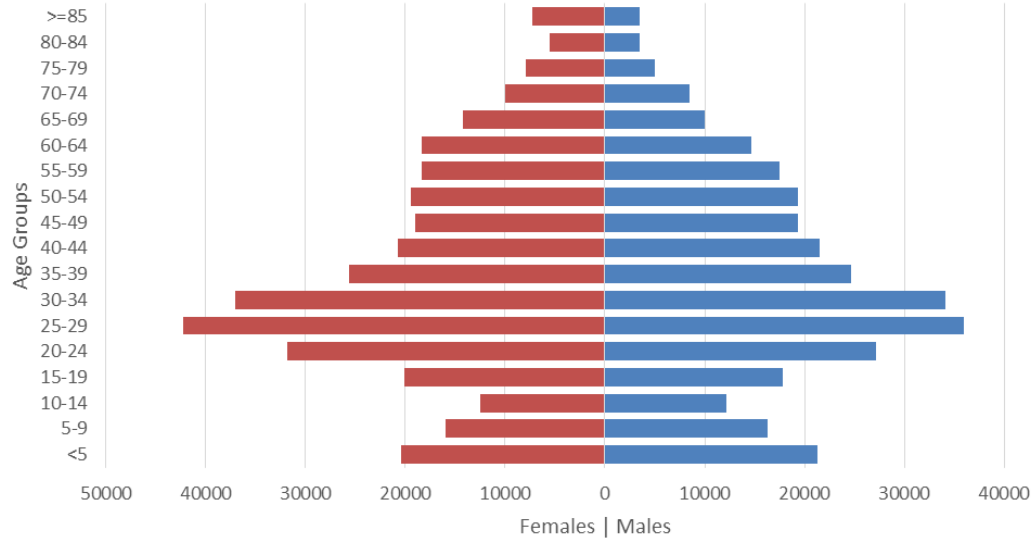


Source: DC Trauma Registry, HEPRA, DC Health

Age, Sex, and Race

The following figure shows the distribution of ages by sex in the District of Columbia based on the 2012-2016 American Community Survey 5-Year Estimates administered by the United States Census Bureau. The age groups are broken into 5-year age bands except for ages greater than or equal to 85 years of age.

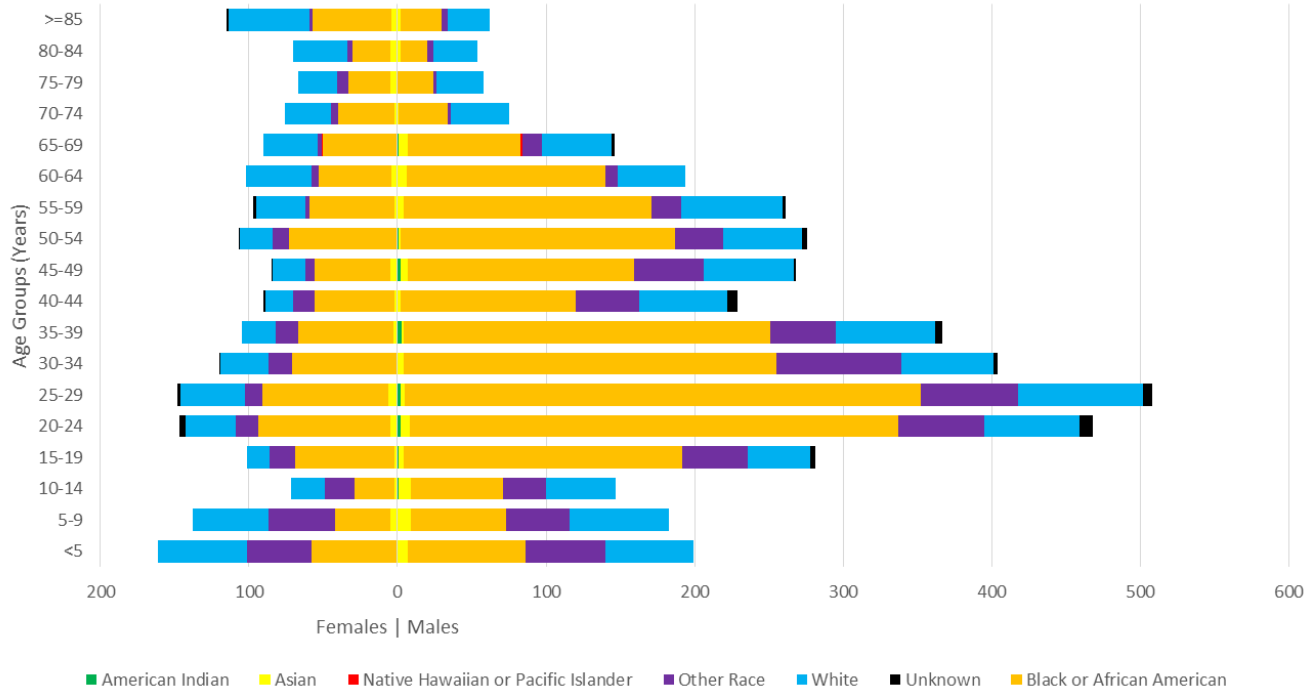
Figure 8 Distribution of Ages in the District of Columbia from the 2012-2016 American Community Survey



Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Figure 9 highlights the differences between the incidence of trauma in males and females within the District of Columbia and includes data on race. See Appendix 1 for this graph's data. It should also be noted that the distributions represented in this graph depict all of the data found in the trauma registry including the cases that were injured outside the District of Columbia.

Figure 9 Age Distribution by Sex and Race of Patient Cases Reported in the District of Columbia Trauma Registry (2016)

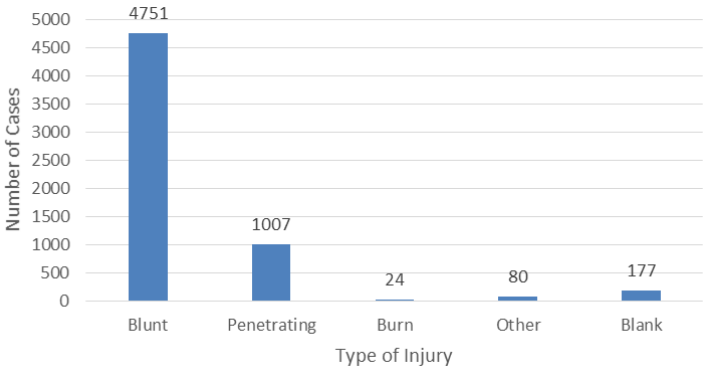


Source: DC Trauma Registry, HEPRA, DC Health

Types of Trauma and Severity

Mechanism of injury and type of injury are reported for each case within the registry. The following graph breaks down the number of cases in each of the five injury types: blunt, penetrating, burn, other, and blank. Blunt injuries constitute over 78% of all of the trauma cases seen in the District of Columbia during 2016. This category represents cases where the primary mechanism of injury for example was a fall, motor vehicle crash, blunt force trauma, pedestrian struck, or bicyclist injury. Penetrating injuries are exclusively comprised of cuts/ piercings, firearms, and environmental causes (bites). These injuries account for over 16% of the trauma cases presented to the four trauma facilities in the District of Columbia in 2016.

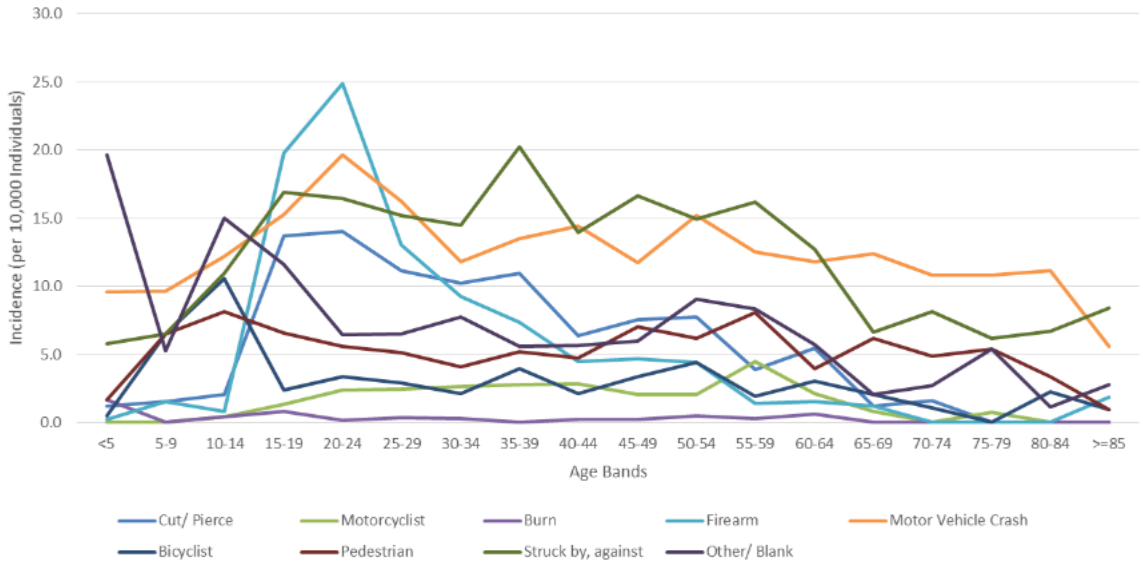
Figure 10 Number of Cases by Injury Type (2016)



Source: DC Trauma Registry, HEPRA, DC Health

Figure 11a provides the incidence of all reported mechanisms of injury except falls by age group for 2016. Figure 11b shows the incidence of falls by age group in 2016. The incidence of each mechanism of injury is defined as the total number of mechanism-specific injuries divided by the estimated population in the same age bracket from aforementioned census data, then multiplied by 10,000. Similar trends can be seen in the National Trauma Data Bank (NTDB) Annual Report 2016 from the American College of Surgeons (Pg. 43).[5]

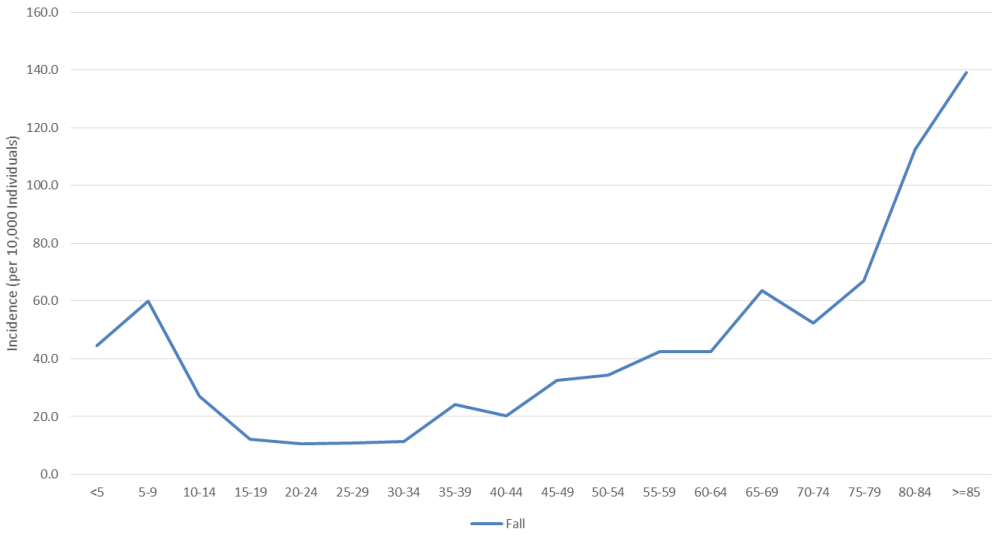
Figure 11a Incidence of Specific Mechanisms of Injury per 10,000 Individuals by Age Bands (2016)



Source: DC Trauma Registry, HEPRA, DC Health

[5] Incidents by Selected Mechanism of Injury and Age, Committee on Trauma, American College of Surgeons. NTDB Annual Report 2016. Chicago, IL

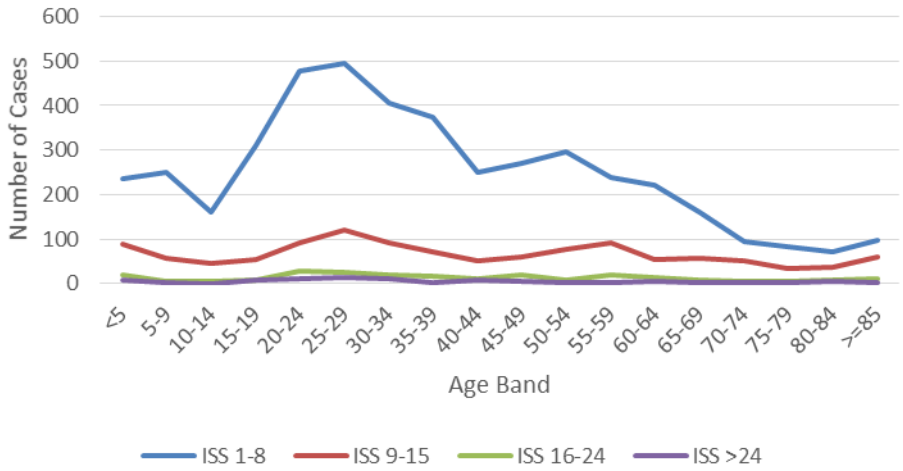
Figure 12b Incidence of Falls per 10,000 Individuals by Age Bands (2016)



Source: DC Trauma Registry, HEPRA, DC Health

The severity of trauma cases is numerically stratified using the Injury Severity Score (ISS) system. The score is calculated by totaling the assigned point values associated with specific levels of injury to the defined regions of the body. The system has a range of one (1) to seventy-five (75) where higher values serve as a reliable predictor of trauma mortality.[6] The NTDB breaks the ISS scores into four categories: ISS 1-8, 9-15, 16-24, and anything greater than 24. The line graph in Figure 12 shows the number of cases in the 2016 data set for each age band and ISS category.

Figure 13 Injury Severity Score (ISS) by Age (2016)



Source: DC Trauma Registry, HEPRA, DC Health

Higher ISS scores correspond to higher case-fatality ratios, almost half of the ninety-three (93) people who were given an ISS score greater than twenty-four (24) died as a result of their injuries. The crude,

[6] Bolorunduro, O. B., Villegas, C., Oyetunji, T. A., Haut, E. R., Stevens, K. A., Chang, D. C., & Haider, A. H. (2011). Validating the Injury Severity Score (ISS) in different populations: ISS predicts mortality better among Hispanics and females. *Journal of surgical research*, *166*(1), 40-44

non-risk adjusted, case-fatality ratios for each ISS range by sex can be found in the table below. Blank values are those cases where the ISS score was not reported in the record.

Table 1 Case-Fatality Ratios by ISS Ranges

ISS Range	Cases			Deaths			Case-Fatality Ratio (per 100 persons)		
	Males	Females	Total	Males	Females	Total	Males	Females	Overall
1-8	3089	1407	4496	27	8	35	0.9	0.6	0.8
9-15	828	366	1194	38	11	49	4.6	3.0	4.1
16-24	165	71	236	25	9	34	15.2	12.7	14.4
>24	73	20	93	38	6	44	52.1	30.0	47.3
Blank†	8	12	20	1	0	1	12.5	0	5.0
Overall	4163	1876	6039	129	34	163	3.1	1.8	2.7

† Blank values were cases where the ISS score was missing
Source: DC Trauma Registry, HEPRA, DC Health

$$\text{Crude Case-Fatality Ratio Calculation} = \frac{Deaths}{Cases} x\ 100$$

Tables 2 through 5 provide the number of trauma cases that presented in the District of Columbia based on their type of injury and ISS score. Injury types coded as blank and unspecified were classified as "Other." The crude, non-risk adjusted, case-fatality ratio has been calculated for each ISS range by the specific injury type.

Table 2 Blunt Injuries

ISS Range	Cases	Deaths	Case-Fatality Ratio (per 100 persons)
1-8	3505	21	0.6
9-15	990	28	2.8
16-24	187	20	10.7
>24	54	20	37.0
Blank	15	1	6.7
Overall	4751	90	1.9

Table 3 Penetrating Injuries

ISS Range	Cases	Deaths	Case-Fatality Ratio (per 100 persons)
1-8	757	13	1.7
9-15	171	20	11.7
16-24	45	12	26.7
>24	34	21	61.8
Blank	0	0	N/A
Overall	1007	66	6.6

Table 4 Burn Injuries

ISS Range	Cases	Deaths	Case-Fatality Ratio (per 100 persons)
1-8	18	0	0
9-15	4	0	0
16-24	0	0	N/A
>24	2	2	100
Blank	0	0	N/A
Overall	24	2	8.3

Table 5 Other Injuries

ISS Range	Cases	Deaths	Case-Fatality Ratio (per 100 persons)
1-8	216	1	0.5
9-15	29	1	3.5
16-24	4	2	50.0
>24	3	1	33.3
Blank	5	0	0
Overall	257	5	2.0

Source: DC Trauma Registry, HEPRA, DC Health
Note: Case-fatality ratios based on fewer than twenty (20) deaths may not be statistically reliable

Outcomes and Contributing Factors

This section of the report presents the data regarding hospital and emergency department disposition, or to what location a patient is discharged after their trauma care. The table below looks at the overall hospital disposition for patients who were seen by one of the four trauma services in 2016. More than one-half of cases (52.4%) are discharged home.

Table 6 Hospital disposition for trauma cases (2016)

Hospital Discharge Disposition	Count	Percent
Home	3166	52.4%
Home Health Service	177	2.9%
Hospice	3	0.0%
Inpatient Rehab	290	4.8%
Intermediate Care Facility (ICF)	2	0.0%
Jail	91	1.5%
Left Against Medical Advice	61	1.0%
Long Term Care Hospital	22	0.4%
Morgue	84	1.4%
Other	1	0.0%
Psychiatric Facility	17	0.3%
Skilled Nursing Facility	182	3.0%
Specialty Referral Hospital	31	0.5%
Unknown[7]	1912	31.7%

Source: DC Trauma Registry, HEPRA, DC Health

The next two tables detail the disposition of patients from the emergency department at the four trauma facilities by penetrating and blunt trauma. The cases are divided by those that were admitted directly into the hospital to floor beds, the intensive care unit (ICU), observation unit, or step-down unit; taken directly to the operating room (OR); and those who died within the emergency department.

The data reveal that there is higher mortality associated with penetrating injuries (4.7%) versus blunt injuries (0.6%), specifically those injuries associated with firearms as the primary mechanism of injury. When comparing blunt versus penetrating injuries, a higher percentage of penetrating trauma victims required a visit to the surgical suite. A higher percentage of the patients suffering from blunt trauma were admitted to floor beds, the intensive care unit (ICU), observation unit, or step-down unit from the emergency department as compared to those who suffered penetrating trauma. Ultimately, the highest mortality was seen in victims of penetrating trauma resulting from firearms.

[7] Other data elements in the trauma registry suggest that the cases with “unknown” dispositions from the hospital may actually have not been updated at the time of the data submission therefore skewing the data presented in this table

Table 7 Emergency department disposition for trauma cases found in the DC Trauma Registry with a blunt injury type in 2016

Primary Mechanism	Total Cases		Admitted to Floor Bed, ICU, Observation Unit, or Step-Down Unit from the ED		Transferred from the ED to the OR		Expired in the ED*	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Fall	2091	43.8%	1509	72.2%	128	6.1%	8	0.4%
Struck by, against	892	18.7%	479	53.7%	39	4.4%	1	0.1%
MVT Occupant†	698	14.6%	339	48.6%	36	5.2%	4	0.6%
MVT Pedestrian†	279	5.8%	163	58.4%	22	7.9%	6	2.2%
MVT Other†	187	3.9%	86	46.0%	11	5.9%	1	0.5%
Pedal cyclist, other	166	3.5%	103	62.0%	7	4.2%	0	0.0%
MVT Motorcyclist†	126	2.6%	77	61.1%	9	7.1%	4	3.2%
Other specified and classifiable	90	1.9%	59	65.6%	10	11.1%	0	0.0%
Transport, other	72	1.5%	52	72.2%	3	4.2%	3	4.2%
Pedestrian, other	70	1.5%	31	44.3%	4	5.7%	0	0.0%
Blank	41	0.9%	15	36.6%	2	4.9%	0	0.0%
MVT Pedal cyclist	36	0.8%	26	72.2%	3	8.3%	0	0.0%
Other	31	0.6%	17	54.8%	4	12.9%	1	3.2%
TOTAL	4779	100.0%	2956	61.9%	278	5.8%	28	0.6%

** This number does not reflect patients that may have subsequently expired in the hospital*
† Motor Vehicle Traffic (MVT)
Source: DC Trauma Registry, HEPRA, DC Health
Notes: This table excludes the following ED dispositions: home with services, home without services, left against medical advice, other (jail, institutional care facility, and mental health facilities), transfers to other hospitals, and dispositions that were blank

Table 8 Emergency department disposition for trauma cases found in the DC Trauma Registry with a penetrating injury time in 2016

Primary Mechanism	Total Cases		Admitted to Floor Bed, ICU, Observation Unit, or Step-Down Unit from the ED		Discharged from the ED to the OR		Expired in the ED	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Cut/pierce	491	48.5%	170	34.6%	118	24.0%	13	2.6%
Firearm	507	50.1%	212	41.8%	115	22.7%	35	6.9%
Natural/ environmental, Bites and stings	14	1.4%	7	50.0%	4	28.6%	0	0.0%
TOTAL	1012	100%	389	38.4%	237	23.4%	48	4.7%

** This number does not reflect patients that may have subsequently expired in the hospital*
Source: DC Trauma Registry, HEPRA, DC Health

Understanding Complications and Comorbidities

A key component to understanding outcomes from trauma care is to better understand the complications and comorbidities associated with each case. The following table lists the complications and the total number that were reported for each type and the percentage of overall cases affected by the specific type of complication. It is important to note that there were 4,576 (75.8%) cases which did not have any complications; however, the reporting relationship is one-to-many, so one patient could have multiple complications.

Table 9 Number of complications and incidence amongst all trauma cases reported in 2016

Complication	Count	Percent
Unplanned Admission to the ICU	59	1.0%
Unplanned intubation	29	0.5%
Cardiac arrest with CPR	25	0.4%
Deep Vein Thrombosis (DVT)	24	0.4%
Pulmonary embolism	20	0.3%
Ventilator-Associated Pneumonia (VAP)	19	0.3%
Acute kidney injury	17	0.3%
Unplanned return to the OR	15	0.2%
Superficial surgical site infection	13	0.2%
Decubitus ulcer	12	0.2%
Acute Respiratory Distress Syndrome (ARDS)	8	0.1%
Drug or alcohol withdrawal syndrome	8	0.1%
Severe sepsis	7	0.1%
Stroke / CVA	6	0.1%
Organ/space surgical site infection	5	0.1%
Catheter-Associated Urinary Tract Infection (CAUTI)	5	0.1%
Deep surgical site infection	4	0.1%
Extremity compartment syndrome	1	0.0%
Myocardial infarction	1	0.0%
Other	1330	22.0%

Source: DC Trauma Registry, HEPRA, DC Health

Only 29.2% of the trauma cases seen in 2016 did not have any comorbidities. Of the remaining 70.8%, the top ten comorbidities are detailed in Table 10. As with complications, individuals could have multiple comorbidities.

Table 10 Number of comorbidities and the percentage of overall trauma cases affected, 2016

Comorbidity	Count	Percent
Other	2205	25.9%
Hypertension	979	11.5%
Current smoker	548	6.4%
Diabetes mellitus	400	4.7%
Alcohol Use Disorder	373	4.4%

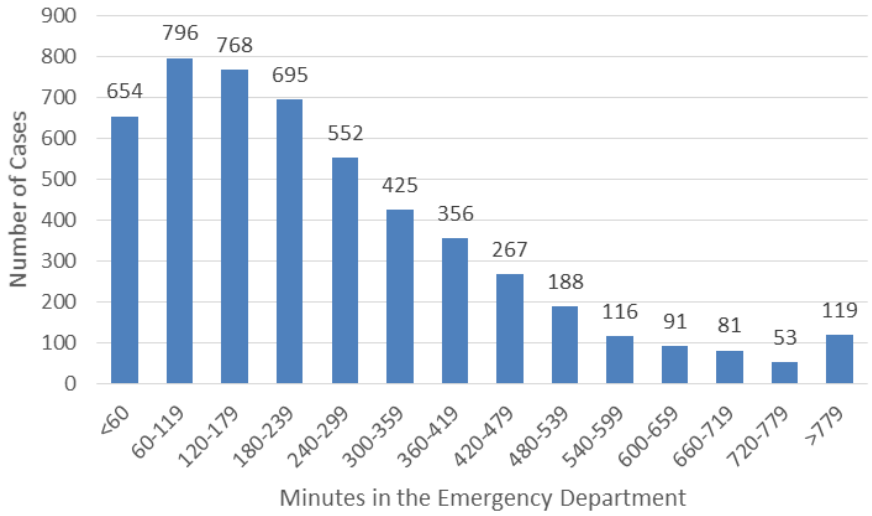
Major psychiatric illness	361	4.2%
Drug use disorder	353	4.2%
Chronic Obstructive Pulmonary Disease (COPD)	144	1.7%
Bleeding disorder	128	1.5%
Functionally dependent health status	113	1.3%

Source: DC Trauma Registry, HEPRA, DC Health

Length of Stay

In the District of Columbia, the average time in the emergency department to disposition for trauma patient is 293.6 minutes or 4.9 hours and the median length of stay is 209 minutes or 3.5 hours in the emergency department. Figure 13 depicts the length of stay in 60 minute intervals up through the first thirteen (13) hours. All cases that remained in the ED longer than thirteen (13) hours were grouped in the final category, greater than 779 minutes. Further inquiry into the length of stay exceeding thirteen (13) hours in the emergency department revealed that some of the longest stays were for patients who were sent home with services and those who were admitted to a telemetry or step-down unit. Cases that were going to an operating room experienced the shortest median time in the emergency department with an average of 154.3 minutes (SD=167.3 min) and a median of 95 minutes (SE=7.4 min).

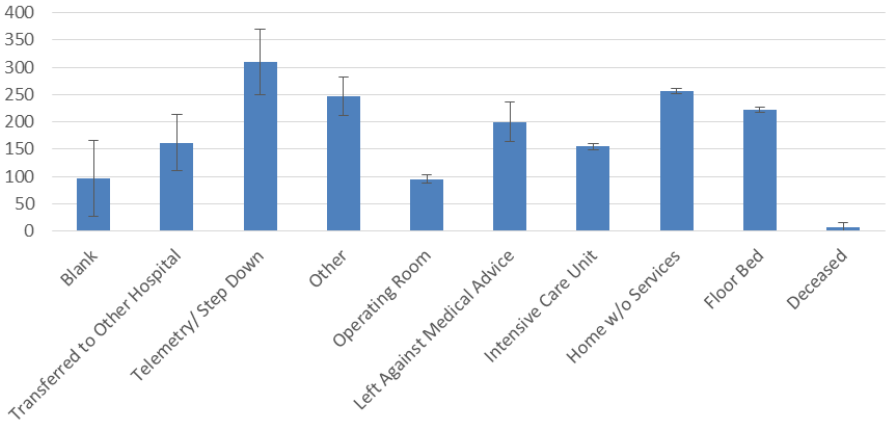
Figure 14 Length of Stay in the Emergency Department by Minutes (2016)



Source: DC Trauma Registry, HEPRA, DC Health

Figure 14 represents the median length of stay in the emergency department by disposition destination. The median value was chosen to represent the data because the averages were significantly impacted by some of the more extreme values for length of stay in the emergency department.

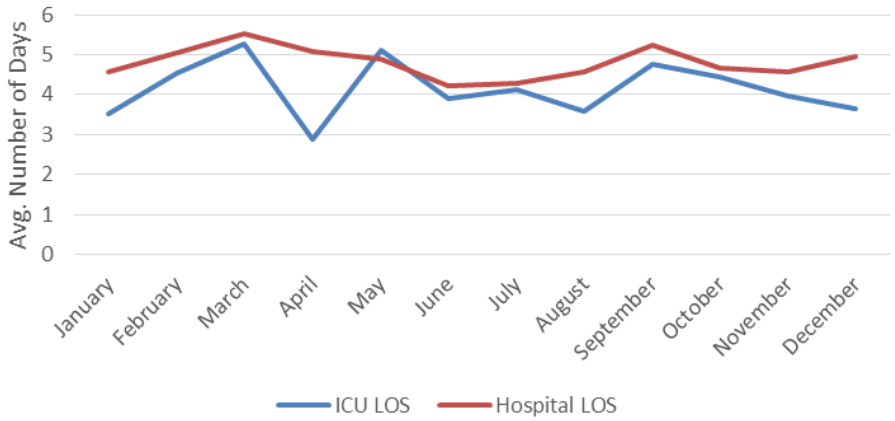
Figure 15 Median Length of Stay in the Emergency Department by Disposition Destination (2016), N=5,161



Source: DC Trauma Registry, HEPRA, DC Health

Those admitted to the ICU and/or the hospital generally experienced similar lengths of stay (LOS) in the hospital throughout the year. On average, the length of stay in both the ICU and hospital was 4-5 days. The graph in Figure 15 shows the average number of days in the ICU and hospital by month in 2016.

Figure 16 Average Length of Stay in ICU and Hospital by Month (2016)

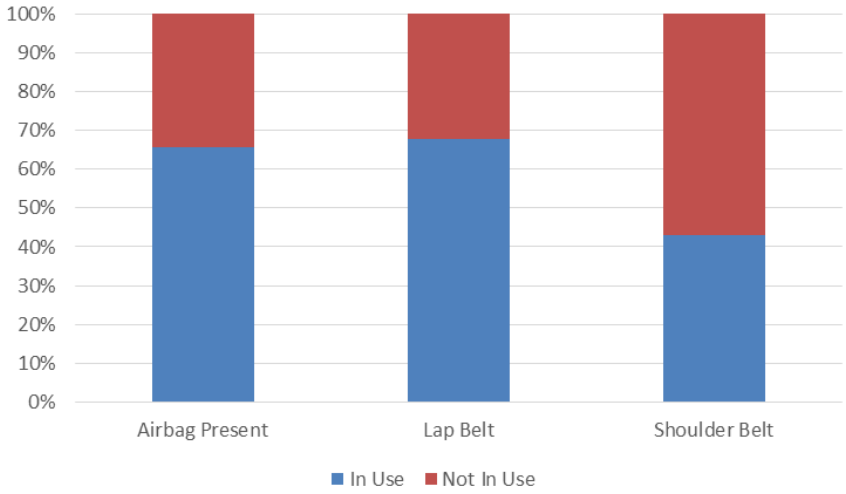


Source: DC Trauma Registry, HEPRA, DC Health

The Use of Protective Equipment

When analyzing the morbidity and mortality of trauma associated with blunt injuries, particularly those as a result of motor vehicle and motorcycle accidents, it is important to also take into account the use of

Figure 17 Usage of Protective Equipment for Motor Vehicle Occupants over the Age of 12 (2016, N=627)

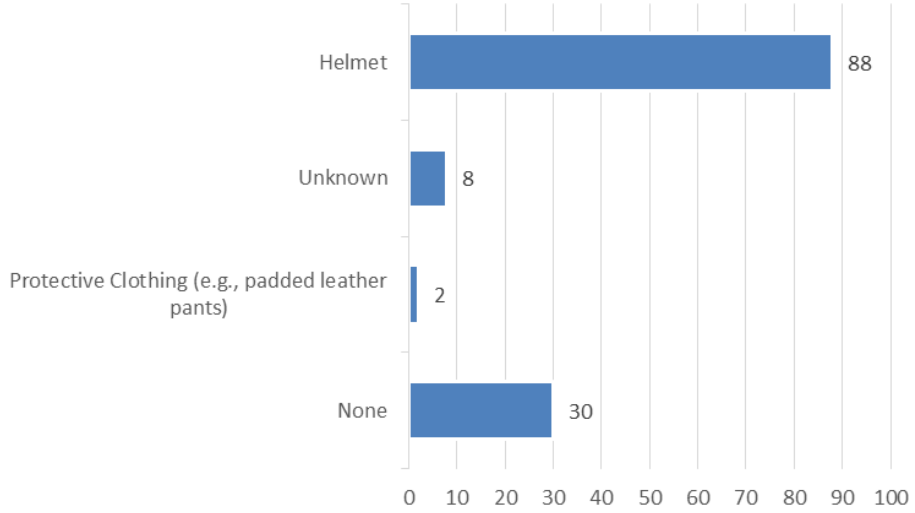


Source: DC Trauma Registry, HEPRA, DC Health

protective equipment. The data regarding protective equipment are aggregated from a variety of sources including the patient themselves, trauma team narratives, emergency department reports, and pre-hospital patient care reports from the transporting emergency medical service (EMS). Figure 16 represents the protective devices used by individuals over the age of twelve (12) who presented to the trauma facility as a vehicle occupant. This graph specifically excludes those who were injured on a motorcycle or bicycle.

Figure 17 reflects the types of protective equipment used by those operating or riding a motorcycle who were seen in the emergency department by trauma staff. There were 126 individuals who were evaluated by trauma teams as a result of a motor vehicle crash involving a motorcycle. Almost a quarter of the individuals were noted as not using any protective equipment based on the data available within the trauma registry. The District of Columbia, Maryland, Virginia, and West Virginia all have universal helmet laws which require that all motorcyclists and passengers wear helmets when the motorcycle is in use.[8]

Figure 18 Protective Equipment Used by Motorcyclists Seen by the Trauma Service in the District of Columbia (2016)



Source: DC Trauma Registry, HEPRA, DC Health

[8] Highway Loss Data Institute, Insurance Institute for Highway Safety. (2018, May). Motorcycles.

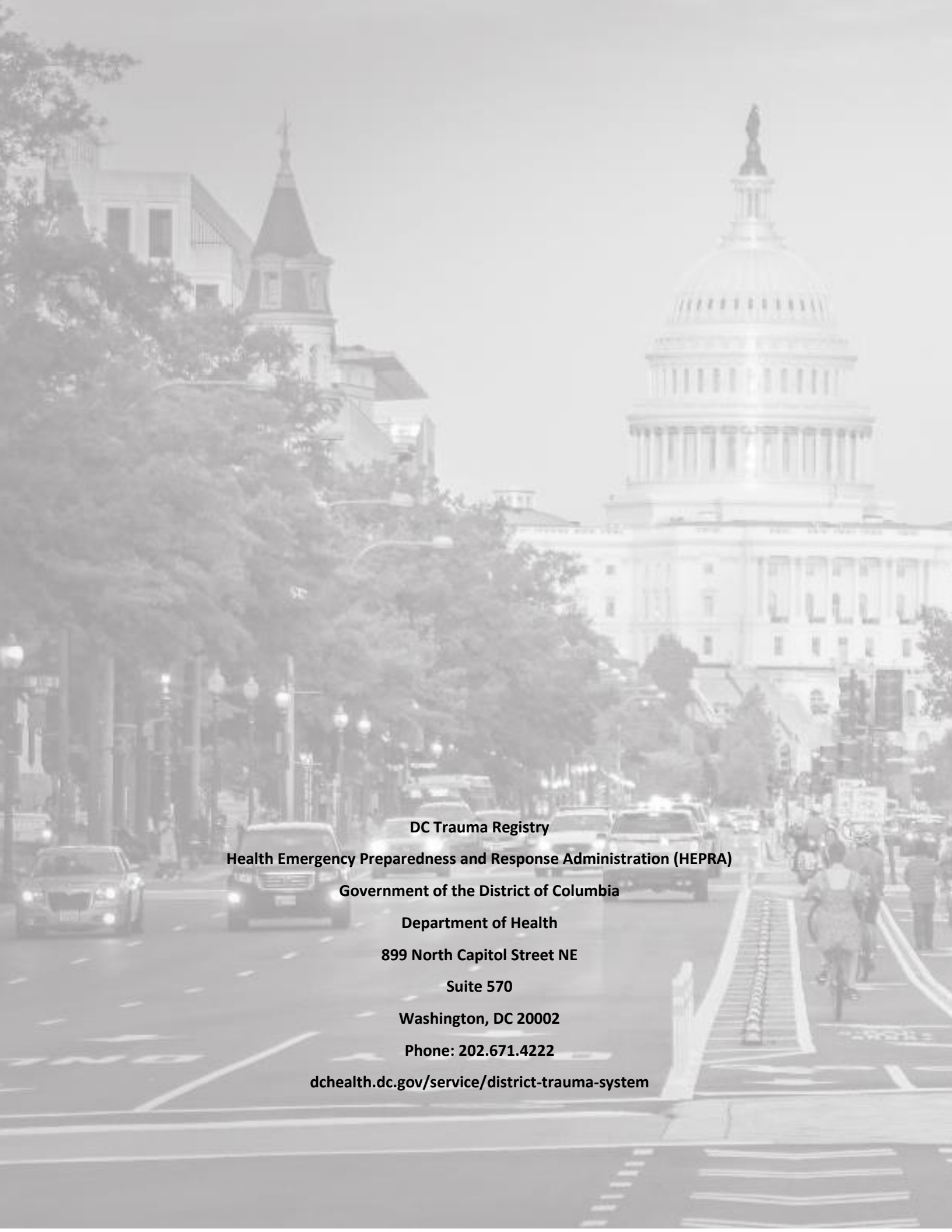
Appendix 1: Age, Sex, Race, and Mechanism of Injury Counts

Age	Male							Female						
	American Indian	Asian	Black or African American	Native Hawaiian or Pacific Islander	Other Race	White	Unknown	American Indian	Asian	Black or African American	Native Hawaiian or Pacific Islander	Other Race	White	Unknown
<5	**0**	**7**	**79**	**0**	**54**	**59**	**0**	**0**	**1**	**57**	**0**	**43**	**60**	**0**
Blunt Injury	*0*	*5*	*68*	*0*	*51*	*57*	*0*	*0*	*1*	*47*	*0*	*39*	*56*	*0*
Penetrating Injury	*0*	*1*	*4*	*0*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*0*	*3*	*0*
Other	*0*	*1*	*7*	*0*	*3*	*1*	*0*	*0*	*0*	*9*	*0*	*4*	*1*	*0*
5-9	**0**	**9**	**64**	**0**	**43**	**67**	**0**	**1**	**4**	**37**	**0**	**45**	**51**	**0**
Blunt Injury	*0*	*8*	*56*	*0*	*40*	*66*	*0*	*1*	*4*	*33*	*0*	*45*	*51*	*0*
Penetrating Injury	*0*	*1*	*6*	*0*	*2*	*1*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*
Other	*0*	*0*	*2*	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*
10-14	**1**	**8**	**62**	**0**	**29**	**47**	**0**	**0**	**2**	**27**	**0**	**20**	**23**	**0**
Blunt Injury	*1*	*7*	*55*	*0*	*26*	*44*	*0*	*0*	*2*	*25*	*0*	*20*	*22*	*0*
Penetrating Injury	*0*	*0*	*5*	*0*	*2*	*2*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Other	*0*	*1*	*2*	*0*	*1*	*1*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	*0*
15-19	**1**	**3**	**188**	**0**	**44**	**42**	**3**	**1**	**1**	**67**	**0**	**17**	**15**	**0**
Blunt Injury	*1*	*3*	*90*	*0*	*25*	*33*	*2*	*1*	*1*	*38*	*0*	*15*	*13*	*0*
Penetrating Injury	*0*	*0*	*80*	*0*	*16*	*4*	*1*	*0*	*0*	*23*	*0*	*1*	*2*	*0*
Other	*0*	*0*	*18*	*0*	*3*	*5*	*0*	*0*	*0*	*6*	*0*	*1*	*0*	*0*
20-24	**2**	**6**	**329**	**0**	**58**	**64**	**9**	**0**	**5**	**89**	**0**	**15**	**34**	**4**
Blunt Injury	*1*	*5*	*131*	*0*	*42*	*55*	*7*	*0*	*5*	*65*	*0*	*12*	*32*	*4*
Penetrating Injury	*1*	*1*	*183*	*0*	*15*	*8*	*1*	*0*	*0*	*19*	*0*	*3*	*1*	*0*
Other	*0*	*0*	*15*	*0*	*1*	*1*	*1*	*0*	*0*	*5*	*0*	*0*	*1*	*0*
25-29	**2**	**3**	**347**	**0**	**66**	**84**	**6**	**1**	**5**	**85**	**0**	**12**	**43**	**2**
Blunt Injury	*2*	*3*	*182*	*0*	*51*	*70*	*6*	*1*	*5*	*61*	*0*	*11*	*40*	*2*
Penetrating Injury	*0*	*0*	*145*	*0*	*13*	*11*	*0*	*0*	*0*	*19*	*0*	*0*	*2*	*0*
Other	*0*	*0*	*20*	*0*	*2*	*3*	*0*	*0*	*0*	*5*	*0*	*1*	*1*	*0*
30-34	**0**	**4**	**251**	**0**	**87**	**62**	**3**	**0**	**1**	**70**	**0**	**16**	**32**	**1**
Blunt Injury	*0*	*3*	*136*	*0*	*66*	*50*	*2*	*0*	*1*	*49*	*0*	*14*	*28*	*1*
Penetrating Injury	*0*	*0*	*102*	*0*	*16*	*8*	*0*	*0*	*0*	*14*	*0*	*0*	*0*	*0*
Other	*0*	*1*	*13*	*0*	*5*	*4*	*1*	*0*	*0*	*7*	*0*	*2*	*4*	*0*
35-39	**3**	**1**	**247**	**0**	**44**	**67**	**5**	**0**	**3**	**64**	**0**	**15**	**23**	**0**
Blunt Injury	*2*	*1*	*162*	*0*	*35*	*57*	*4*	*0*	*3*	*59*	*0*	*13*	*22*	*0*
Penetrating Injury	*1*	*0*	*74*	*0*	*8*	*6*	*1*	*0*	*0*	*2*	*0*	*1*	*0*	*0*
Other	*0*	*0*	*11*	*0*	*1*	*4*	*0*	*0*	*0*	*3*	*0*	*1*	*1*	*0*

Age	Male							Female						
	American Indian	Asian	Black or African American	Native Hawaiian or Pacific Islander	Other Race	White	Unknown	American Indian	Asian	Black or African American	Native Hawaiian or Pacific Islander	Other Race	White	Unknown
40-44	**0**	**2**	**118**	**0**	**43**	**59**	**7**	**0**	**2**	**54**	**0**	**14**	**19**	**1**
Blunt Injury	*0*	*2*	*76*	*0*	*41*	*54*	*5*	*0*	*2*	*41*	*0*	*14*	*16*	*1*
Penetrating Injury	*0*	*0*	*30*	*0*	*2*	*4*	*2*	*0*	*0*	*9*	*0*	*0*	*1*	*0*
Other	*0*	*0*	*12*	*0*	*0*	*1*	*0*	*0*	*0*	*4*	*0*	*0*	*2*	*0*
45-49	**2**	**5**	**152**	**0**	**47**	**61**	**1**	**0**	**5**	**51**	**0**	**6**	**22**	**1**
Blunt Injury	*2*	*3*	*109*	*0*	*44*	*57*	*1*	*0*	*5*	*39*	*0*	*6*	*22*	*1*
Penetrating Injury	*0*	*2*	*32*	*0*	*3*	*3*	*0*	*0*	*0*	*7*	*0*	*0*	*0*	*0*
Other	*0*	*0*	*11*	*0*	*0*	*1*	*0*	*0*	*0*	*5*	*0*	*0*	*0*	*0*
50-54	**1**	**1**	**185**	**0**	**32**	**53**	**4**	**0**	**1**	**72**	**0**	**11**	**22**	**1**
Blunt Injury	*1*	*1*	*134*	*0*	*26*	*50*	*3*	*0*	*1*	*68*	*0*	*9*	*20*	*1*
Penetrating Injury	*0*	*0*	*38*	*0*	*4*	*2*	*1*	*0*	*0*	*1*	*0*	*0*	*1*	*0*
Other	*0*	*0*	*13*	*0*	*2*	*1*	*0*	*0*	*0*	*3*	*0*	*2*	*1*	*0*
55-59	**0**	**4**	**167**	**0**	**20**	**68**	**2**	**1**	**1**	**57**	**0**	**3**	**33**	**2**
Blunt Injury	*0*	*4*	*142*	*0*	*17*	*67*	*2*	*1*	*0*	*52*	*0*	*2*	*32*	*2*
Penetrating Injury	*0*	*0*	*15*	*0*	*1*	*1*	*0*	*0*	*1*	*2*	*0*	*0*	*0*	*0*
Other	*0*	*0*	*10*	*0*	*2*	*0*	*0*	*0*	*0*	*3*	*0*	*1*	*1*	*0*
60-64	**0**	**6**	**134**	**0**	**8**	**46**	**0**	**1**	**3**	**49**	**0**	**5**	**44**	**0**
Blunt Injury	*0*	*5*	*109*	*0*	*7*	*43*	*0*	*1*	*3*	*45*	*0*	*5*	*43*	*0*
Penetrating Injury	*0*	*1*	*17*	*0*	*1*	*2*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	*0*
Other	*0*	*0*	*8*	*0*	*0*	*1*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*
65-69	**1**	**6**	**76**	**1**	**13**	**47**	**2**	**0**	**0**	**50**	**1**	**3**	**36**	**0**
Blunt Injury	*1*	*6*	*71*	*1*	*12*	*45*	*2*	*0*	*0*	*47*	*1*	*3*	*36*	*0*
Penetrating Injury	*0*	*0*	*4*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*
70-74	**0**	**1**	**33**	**0**	**2**	**39**	**0**	**0**	**2**	**38**	**0**	**5**	**31**	**0**
Blunt Injury	*0*	*1*	*32*	*0*	*2*	*38*	*0*	*0*	*2*	*36*	*0*	*5*	*31*	*0*
Penetrating Injury	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*
Other	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
75-79	**0**	**0**	**24**	**0**	**2**	**32**	**0**	**0**	**5**	**28**	**0**	**8**	**26**	**0**
Blunt Injury	*0*	*0*	*23*	*0*	*2*	*31*	*0*	*0*	*5*	*27*	*0*	*8*	*26*	*0*
Penetrating Injury	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
80-84	**0**	**2**	**18**	**0**	**4**	**30**	**0**	**0**	**5**	**25**	**0**	**4**	**36**	**0**
Blunt Injury	*0*	*2*	*18*	*0*	*4*	*30*	*0*	*0*	*5*	*24*	*0*	*4*	*36*	*0*
Penetrating Injury	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*

Age	Male							Female						
	American Indian	Asian	Black or African American	Native Hawaiian or Pacific Islander	Other Race	White	Unknown	American Indian	Asian	Black or African American	Native Hawaiian or Pacific Islander	Other Race	White	Unknown
>=85	**0**	**2**	**28**	**0**	**4**	**28**	**0**	**0**	**4**	**53**	**0**	**2**	**55**	**1**
Blunt Injury	*0*	*2*	*24*	*0*	*4*	*28*	*0*	*0*	*4*	*52*	*0*	*2*	*55*	*1*
Penetrating Injury	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Other	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

** The total count of this table is 6,074 versus 6,039 because there are some cases that have multiple races selected as opposed to just one.



DC Trauma Registry

Health Emergency Preparedness and Response Administration (HEPRA)

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