



ANNUAL REPORT

2021

RIGHT PATIENT. RIGHT PLACE. RIGHT TIME.

NOTS
NORTHERN OHIO TRAUMA SYSTEM



Right **patient.**
Right **place.**
Right **time.**

NOTS, at its inception, was a collaboration among health care systems with the goal of getting the "right patient to the right place at the right time." As NOTS has matured, our mission has expanded beyond the walls of our own institutions to include health care providers throughout the region. In the past four years we have expanded even further as we launched online virtual training and continued support for the Stop the Bleed campaign.

TABLE OF CONTENTS

NOTS MISSION STATEMENT.....	03	MOTOR VEHICLE AND MOTORCYCLE CRASH.....	21
EXECUTIVE SUMMARY	04	GUNSHOT WOUND	27
NOTS STAFF.....	05	NON-ACCIDENTAL TRAUMA	34
WELCOMING OUR FIRST NON-TRAUMA CENTER	06	PEDIATRIC AND ADOLESCENT.....	35
CURRENT NOTS HOSPITALS	07	PENETRATING TRAUMA	37
FREQUENCY OF TRAUMA.....	09	OUTCOMES.....	42
ALL TRAUMA.....	11	NOTS VIOLENCE PREVENTION PROGRAM.....	46
YEARS OF POTENTIAL LIFE LOST	12	NOTS ADVISORY BOARD.....	47
MECHANISMS OF INJURY.....	13	GLOSSARY OF TERMS	49
FALLS.....	17		

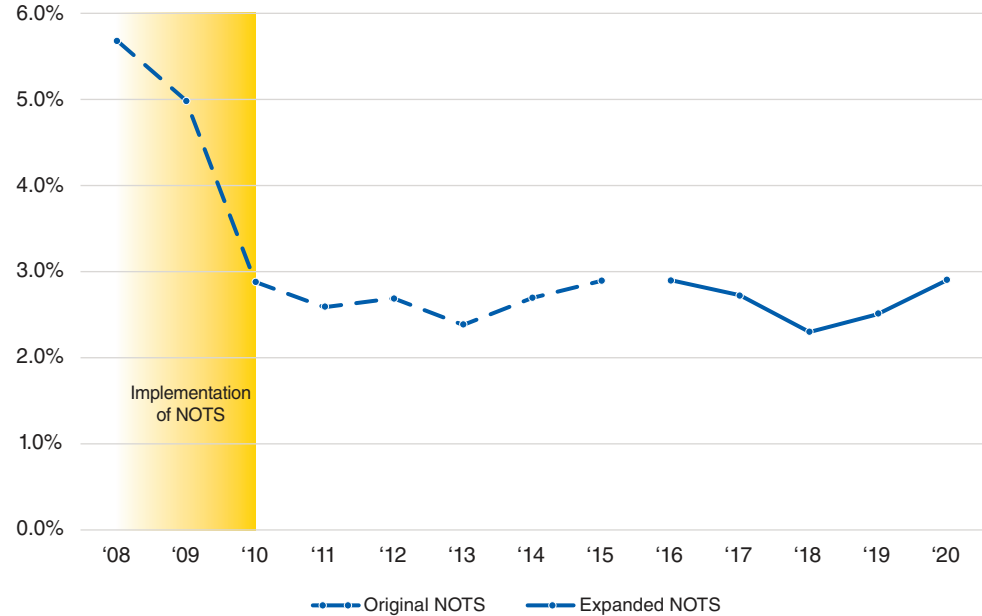


MISSION STATEMENT

To provide the highest **quality of care** to patients across the region by rigorously evaluating and improving outcomes, optimizing resources and providing education utilizing a collaborative approach with hospitals, emergency medical services and the public health services.

Right patient.
Right place.
Right time.

MORTALITY



EXECUTIVE SUMMARY

GREETING FROM OUR MEDICAL DIRECTOR

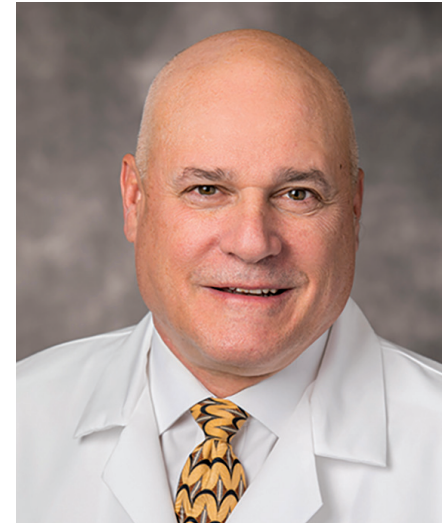
As my predecessors, Drs. Claridge and Walsh, have done before me, the medical director of the Northern Ohio Trauma System (NOTS) has the responsibility of introducing the publication of our annual report. In preparing to do so, I have taken the opportunity to review our prior nine reports. These reports tell many stories but in aggregate clearly detail NOTS' remarkable and enduring legacy of trauma system development throughout Northeast Ohio. They also demonstrate the impact of this unique collaborative effort in public health to effectively implement and achieve an inclusive regional trauma system. Finally, these reports document the impact the NOTS collaboration has had on reducing the burden of injury in Northeast Ohio over the last decade.

This legacy continues to be documented in our 2021 Annual Report. Our current report follows the format of our previous reports, featuring the collaborative efforts of NOTS. The most salient offering is the myriad of graphs and tables including 2020 data of trauma patient volumes and outcome managed by our region's trauma centers. This 2021 report also focuses on the continued endemic of gun violence in Northeast Ohio and the significant impact that the Covid-19 pandemic has had our trauma system in 2020.

Finally, I would like to acknowledge the NOTS staff, Danielle Rossler, Trauma Program Manager; Olivia Houck, Data Specialist; Tod Baker, EMS Coordinator; and Andrea Martemus-Peters, Violence/Injury Prevention Coordinator. Without their combined efforts, this report and the many accomplishments attributable to NOTS would not be possible. We hope you find the NOTS 2021 Annual Report valuable as we look forward to continuing our service to our member healthcare systems and their trauma centers as well as Northeast Ohio.

Sincerely,

Glen Tinkoff, MD, FACS, FCCM



Glen Tinkoff, MD, FACS, FCCM
Trauma Medical Director, NOTS

NOTS STAFF

Throughout this report, you will see graphs that look across many years of NOTS data. To demonstrate the expansion of NOTS in 2016, these graphs contain a dotted line (representing "original NOTS") and a solid line (representing "expanded NOTS"). The hospitals included in the dotted line are: Cleveland Clinic Fairview Hospital, Cleveland Clinic Hillcrest Hospital and MetroHealth Medical Center. The solid line includes, in addition to these three hospitals: Cleveland Clinic Akron General, Southwest General Health Center, University Hospitals Cleveland Medical Center, University Hospitals Rainbow Babies and Children's Hospital, University Hospitals Geauga Medical Center, University Hospitals Portage Medical Center, and University Hospitals St. John Medical Center.



**Glen Tinkoff,
MD, FACS, FCCM**
Trauma Medical Director,
NOTS



**Danielle Rossler,
MBA, BSN, RN**
Trauma Program Manager



**Andrea Martemus-
Peters, MSSA, LSW**
Violence/Injury
Prevention Coordinator



**Olivia C. Houck,
MPH, CPH**
Data Specialist



**Tod Baker,
EMS-P**
EMS Coordinator

WELCOMING OUR FIRST NON-TRAUMA CENTER



ST. VINCENT CHARITY
MEDICAL CENTER

A Ministry of the Sisters of Charity Health System



Janice G. Murphy, MSN, FACHE
President and CEO, St. Vincent Charity
Medical Center

ST. VINCENT CHARITY MEDICAL CENTER

We are proud to welcome our first non-trauma hospital center to NOTS, St. Vincent Charity Medical Center. St. Vincent is in the heart of downtown Cleveland, and though it isn't a trauma center, its staff still sees its fair share. St. Vincent joined at the end of 2020 and fully came on board at the beginning of 2021.

St. Vincent was established in 1851 by the Sisters of Charity of St. Augustine. They were brought to Cleveland at the request of Bishop Amadeus Rappe, the first bishop of Cleveland.

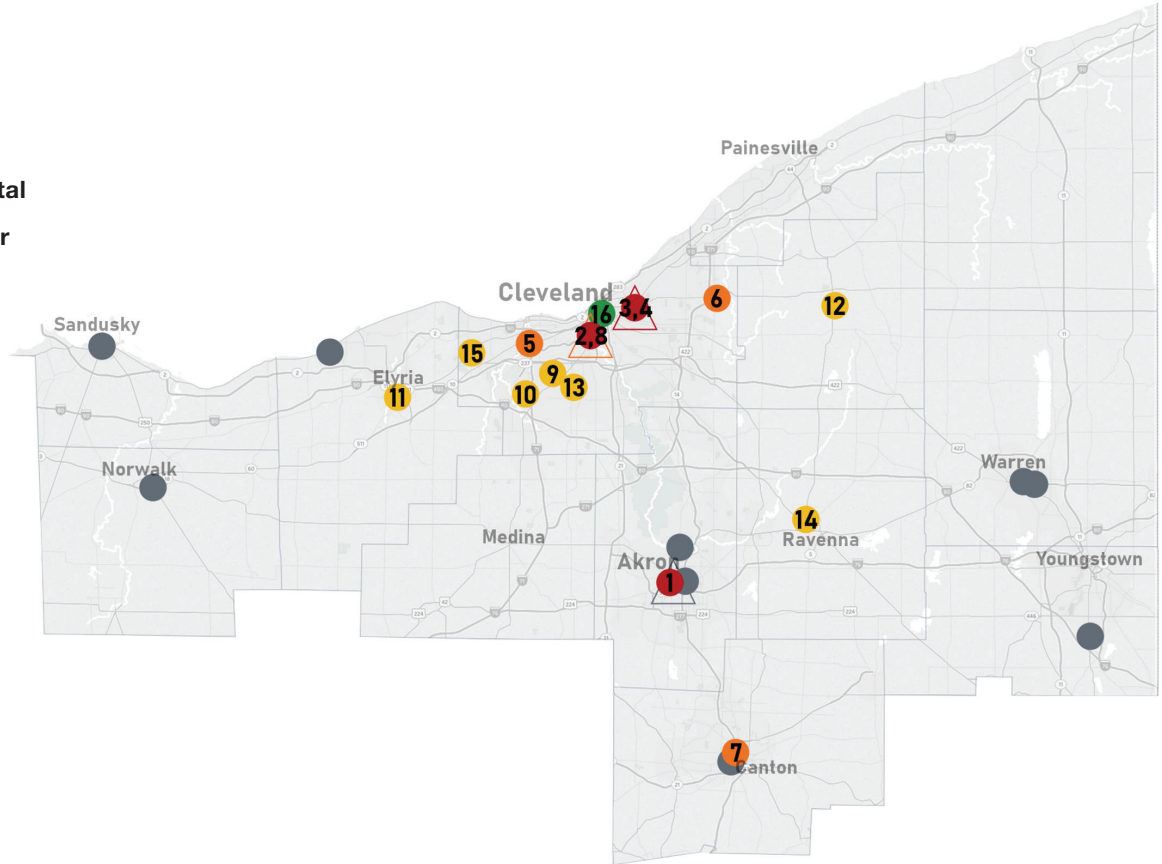
St. Vincent is now known for being a teaching hospital, as well as for its Spine and Orthopedic Institute, Center for Bariatric Surgery and its complete services in cardiovascular, emergency medicine, primary care, behavioral health, occupational health and addiction medicine.

"St. Vincent Charity Medical Center is committed to providing high quality, compassionate care to our patients. Joining the Northern Ohio Trauma System allows us to further our mission of continuing education for our caregivers and ensures our community continues to have access to trauma care in times of crisis."

- Janice G. Murphy, MSN, FACHE, President and CEO, St. Vincent Charity Medical Center

CURRENT NOTS HOSPITALS

- Adult Level I
- Adult Level II
- Adult Level III
- NOTS Non-Trauma Hospital
- Non-NOTS Trauma Center
- △ Pediatric Level I
- △ Pediatric Level II



Level I

1. Cleveland Clinic Akron General
2. MetroHealth Medical Center (Adult)
3. University Hospitals Cleveland Medical Center
4. University Hospitals Rainbow Babies & Children's Hospital

Level II

5. Cleveland Clinic Fairview Hospital
6. Cleveland Clinic Hillcrest Hospital
7. Cleveland Clinic Mercy Hospital - Canton*
8. MetroHealth Medical Center (Pediatric)

Level III

9. MetroHealth Parma Medical Center
10. Southwest General Health Center
11. UH Elyria Medical Center
12. UH Geauga Medical Center
13. UH Parma Medical Center
14. UH Portage Medical Center
15. UH St. John Medical Center

NOTS Non-Trauma

16. St. Vincent Charity Medical Center*

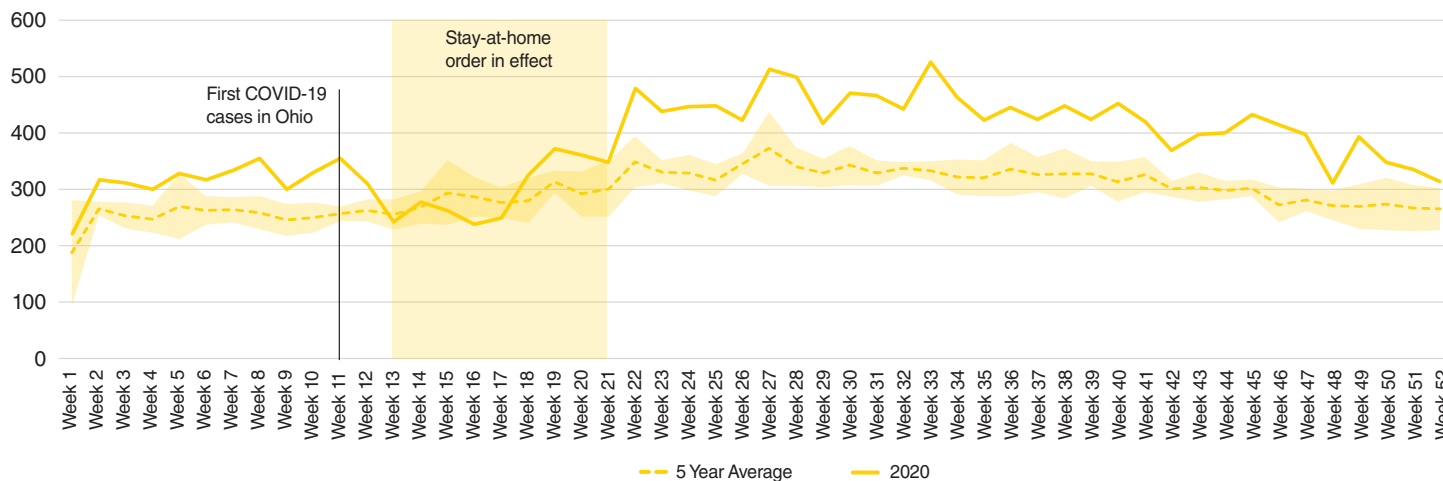
*These centers did not contribute data to this year's annual report. Cleveland Clinic Mercy Canton, will contribute data in future years. As a non-trauma hospital, St. Vincent will not contribute data to the regional registry.



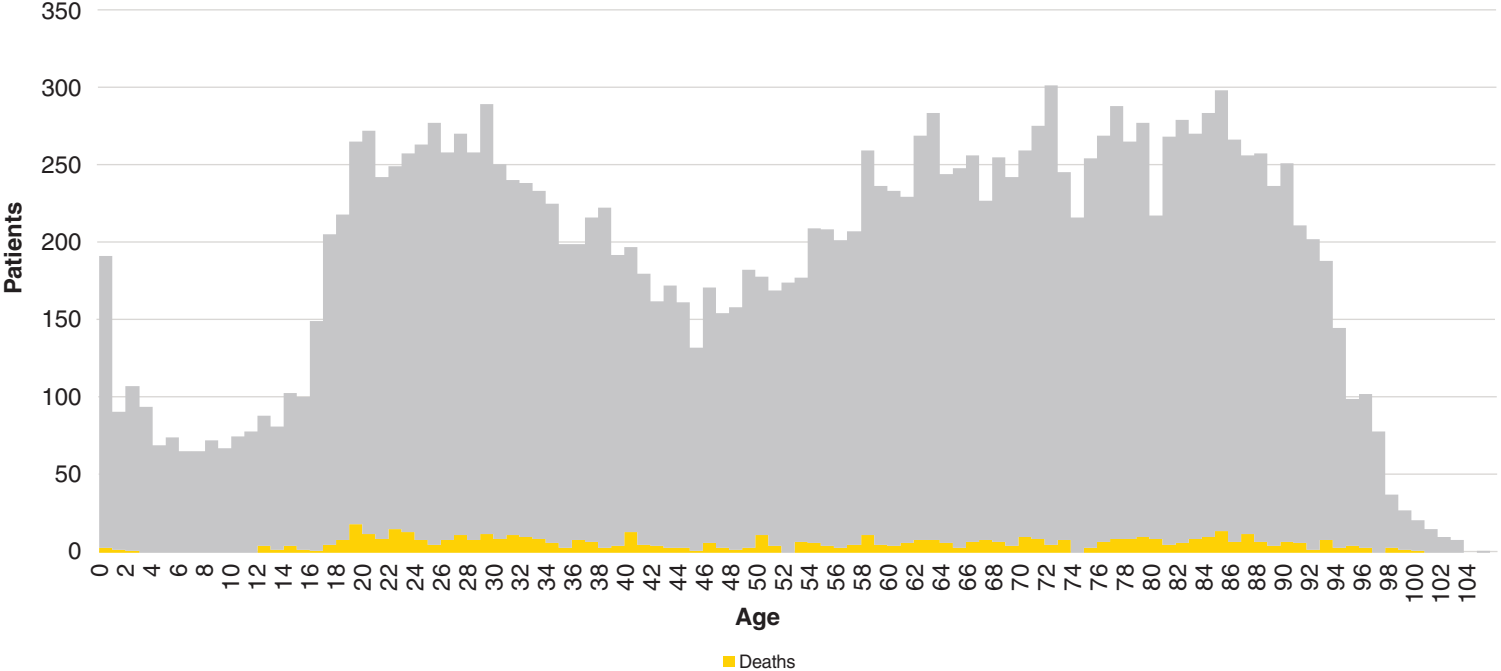
FREQUENCY OF TRAUMA

This graph compares frequency of trauma in 2020 to the historical average for NOTS. The solid line shows the number of trauma patients seen each week at a NOTS trauma center, while the dotted line shows the average of the previous five years. The shading around the dotted line reflects how much year-to-year variation around the average there was in a given week. Of note, 2020 data includes three new Level III trauma centers, which contributes to increased trauma volume recorded in the region. However, since this isn't an increase that is seen evenly throughout the year, it is unlikely that reporting from these new centers alone accounted for increase frequency of trauma in 2020.

FREQUENCY OF TRAUMA BY WEEK (COMPARED TO PREVIOUS YEARS' AVERAGE)

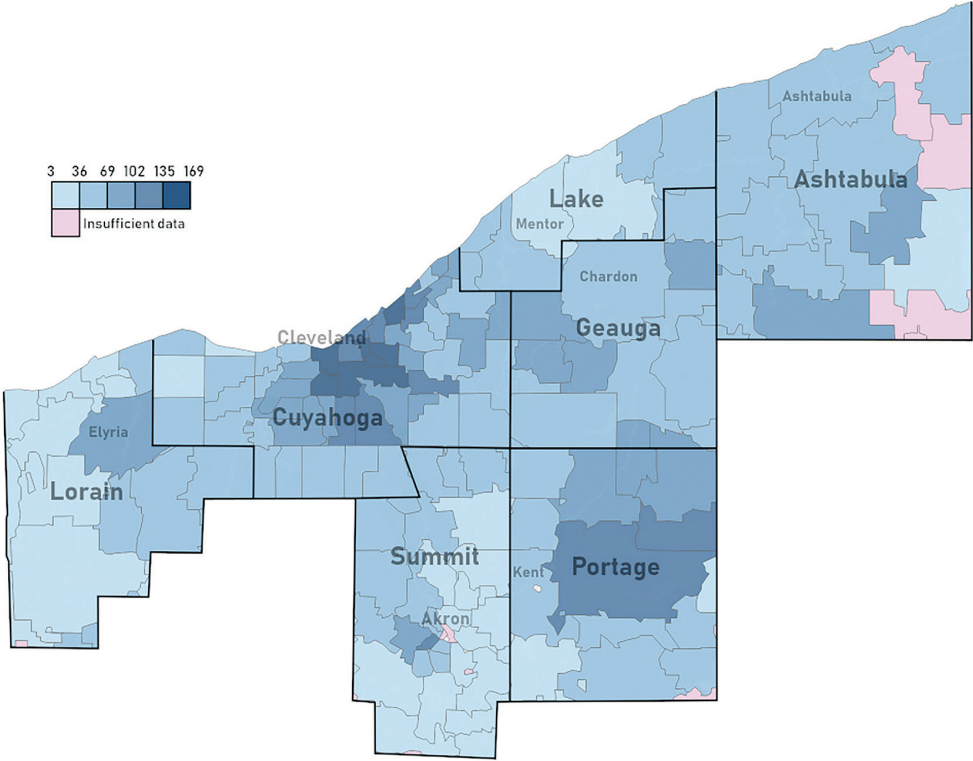


FREQUENCY OF TRAUMA BY AGE



ALL TRAUMA

ALL TRAUMATIC INJURY PATIENTS SEEN AT A NOTS TRAUMA CENTER BY HOME ZIP CODE (PER 10,000 POPULATION)



YEARS OF POTENTIAL LIFE LOST

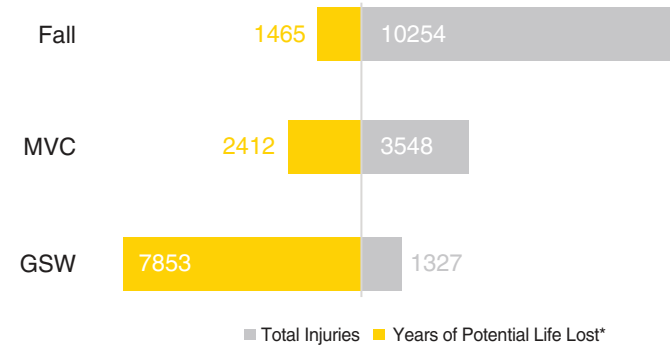
Years of potential life lost (YPLL) is measure of the years a person would have lived had they not died prematurely. This is used to give an idea of population burden of disease. For example, a high amount of YPLLs can point to lost contributions a person could have made to society. In these calculations, 75 years was used as the reference life expectancy.

We looked at YPLLs for the top three mechanisms of injury in 2020: falls, motor vehicle collisions (MVC), and gunshot wounds (GSW). YPLLs were inversely proportional to total injuries of that mechanism, with falls having the most injuries but fewest YPLLs and GSWs having to least injuries but highest YPLLs. This is because falls tend to be more fatal in older individuals and GSWs in general occur more often in younger individuals.

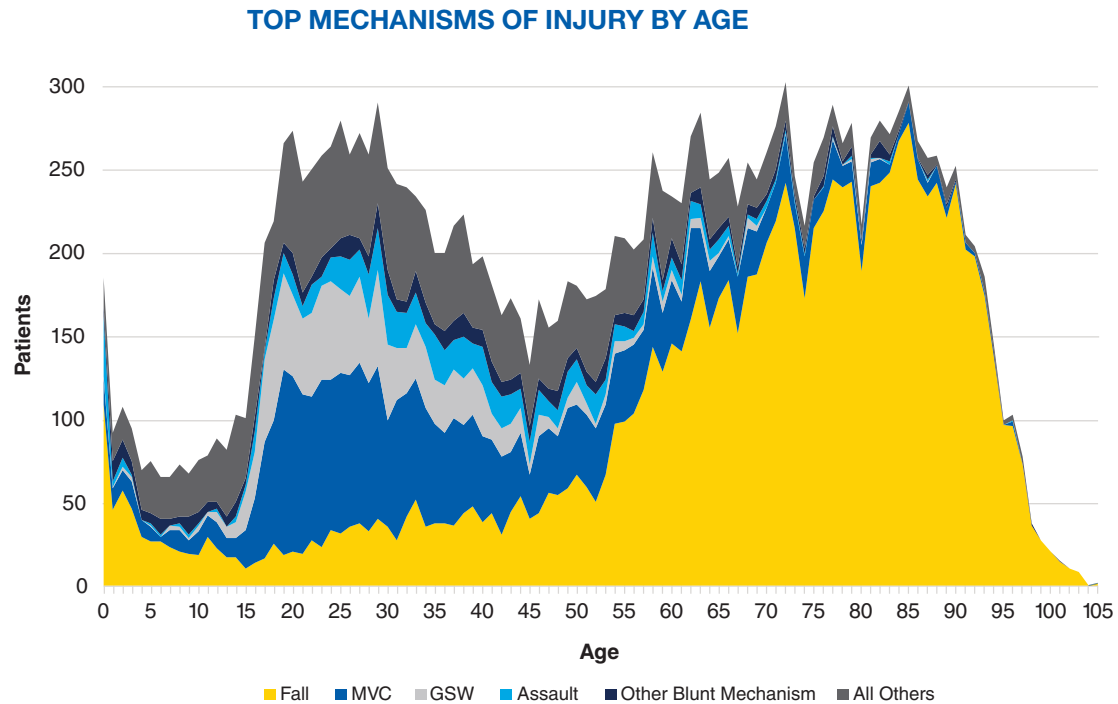
	Total Injuries	Deaths	Mortality	YPLL*	Mean YPLL per Death
Fall	10254	174	1.7%	1465	8.4
MVC	3548	56	1.6%	2412	43.1
GSW	1327	118	8.9%	7853	66.6

*This YPLL calculation assumes a 75-year life expectancy

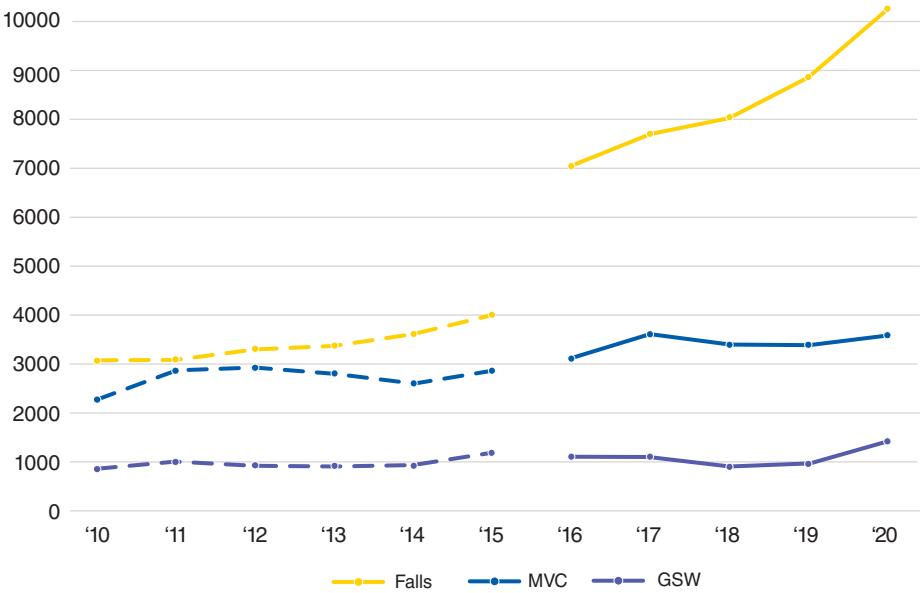
YEARS OF POTENTIAL LIFE LOST FOR TOP THREE MECHANISMS OF INJURY



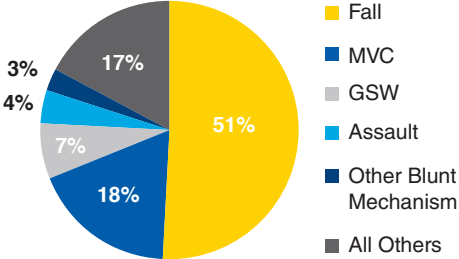
MECHANISMS OF INJURY



TOP MECHANISMS OF INJURY BY YEAR



ALL PATIENTS



Three new Level III trauma centers became operational in 2020. Though there has been an upward trend in falls over the last several years, the addition of new Level III centers likely contributed to the particularly steep increase between 2019 and 2020.

Note: All others includes: Asphyxiation, Bicycle, Biting, Burn, Drowning, Hanging, Horse and Rider, Motorcycle, Not Documented, Off Road/Other Vehicle, Other, Other Penetrating, Pedestrian Struck, Sport Injury, Stabbing, Unknown, and Watercraft

MECHANISMS OF INJURY

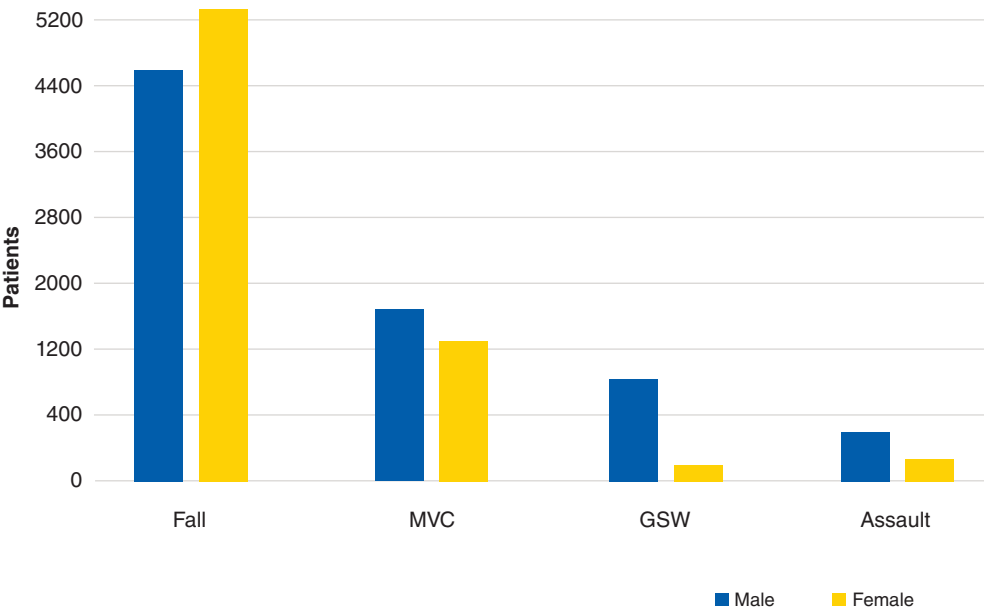
MECHANISM OF INJURY BY AGE GROUP

Mechanism	<15	15-20	21-40	41-65	66-80	>80	Total
MVC	175	422	1537	988	322	99	3543
Fall - 10ft or More	56	29	161	262	107	43	658
Fall - Under 10ft	329	27	145	419	548	535	2003
Fall - Same Level	99	33	242	1184	2050	2524	6132
Fall - Not Further Specified	18	13	156	434	399	432	1452
Assault	57	58	388	283	34		820
Asphyxiation/ Hanging/Drowning	14		18		10		42
Motorcycle	49		264	254	46		613
MVC vs. Pedestrian	40	44	174	140	46	16	460
Bicycle	89	38	56	123	52		358
Other/Off-Road Vehicle	38	44	142	94	15		333
Horse and Rider	23		12		34		69
Other Blunt	110	45	204	241	69	32	701
Other Penetrating	25	19	102	66	18		230
Stabbing	20		181		96		297
GSW	43	267	800	194	20		1324
Biting	54		23	26	10		113
Sport Injury	89	47	27		13		176
Burn	51		44	53	20		168
Watercraft	14				10		24
Unknown	15			23	18		56
Totals	1296	1183	4691	4926	3755	3721	19572

MECHANISM OF INJURY BY INJURY SEVERITY SCORE GROUP

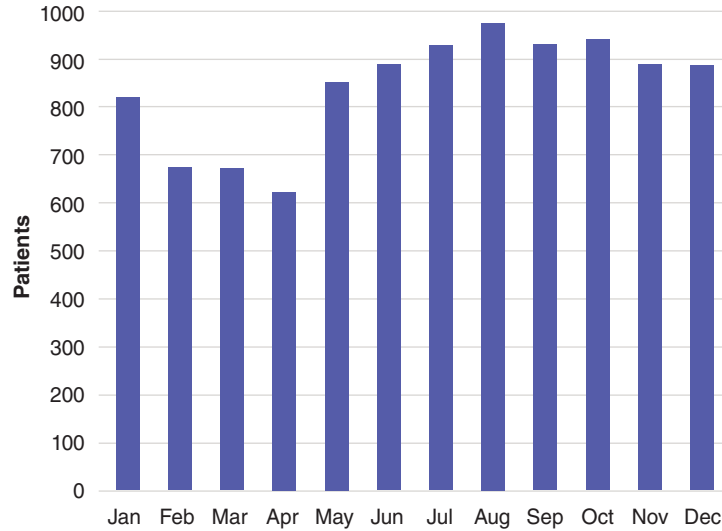
Mechanism	<9	9-14	15-24	25+
MVC	1494	505	223	174
Fall - 10ft or More	294	131	51	42
Fall - Under 10ft	920	563	76	48
Fall - Same Level	2551	2219	266	136
Fall - Not Further Specified	676	417	112	76
Assault	342	110	47	19
Asphyxiation/ Hanging/Drowning	7	11	2	9
Motorcycle	224	176	65	49
MVC vs. Pedestrian	178	77	43	33
Bicycle	183	96	16	8
Other/Off-Road Vehicle	176	80	31	17
Horse and Rider	35	22	5	2
Other Blunt	410	105	36	16
Other Penetrating	158	20	2	2
Stabbing	129	33	12	5
GSW	405	280	127	204
Watercraft	6	5	6	1
Biting	97	2		
Sport Injury	131	26	6	3
Burn	69	2	1	1
Unknown	21	10	3	7
Totals	8506	4890	1130	851

TOP MECHANISMS OF INJURY BY GENDER

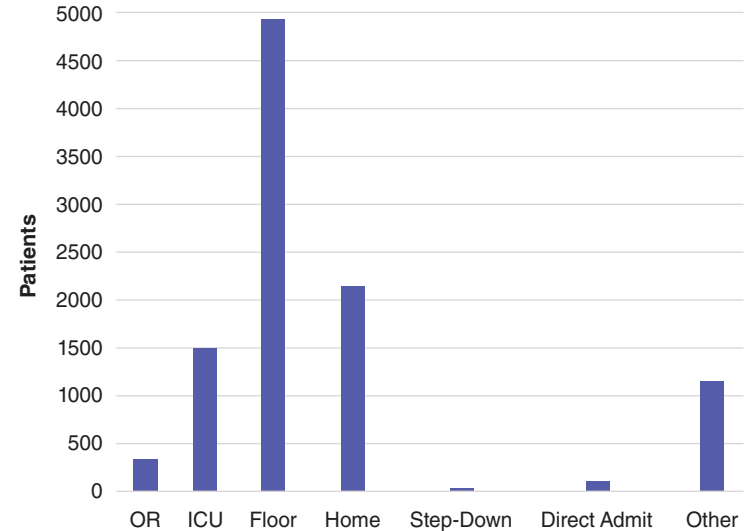


FALLS

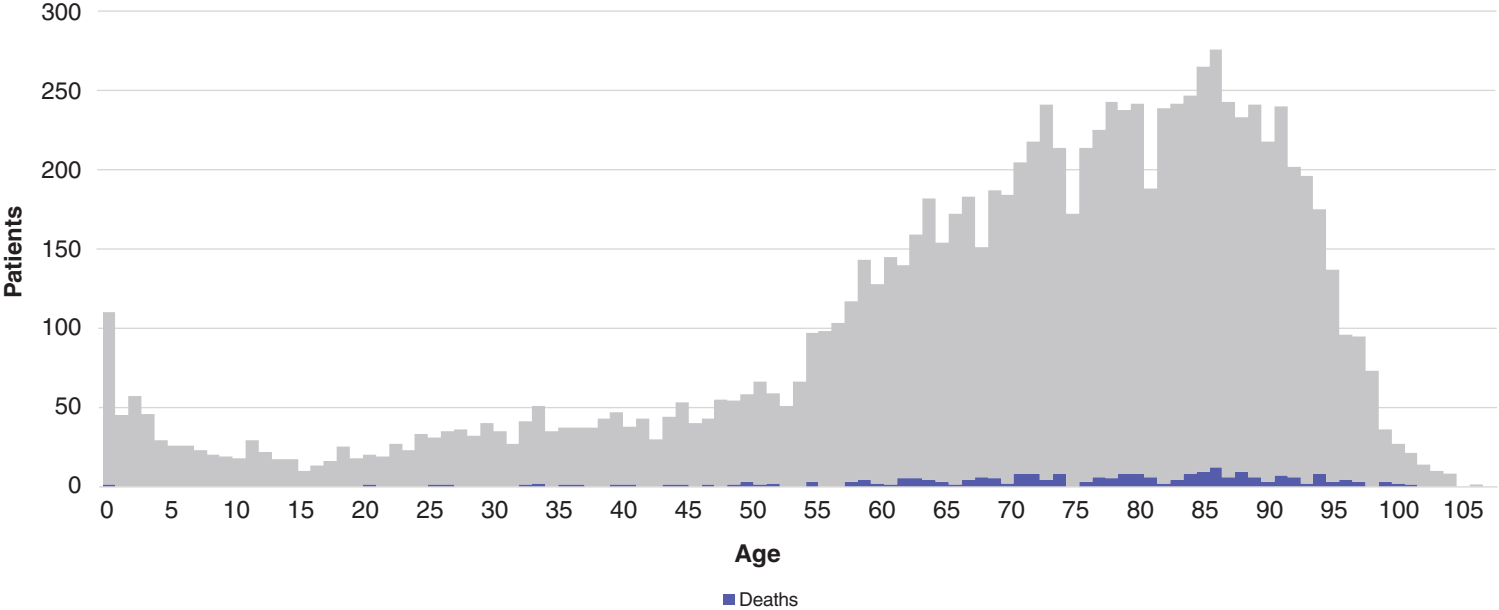
FALLS BY MONTH



FALLS BY ED DISPOSITION



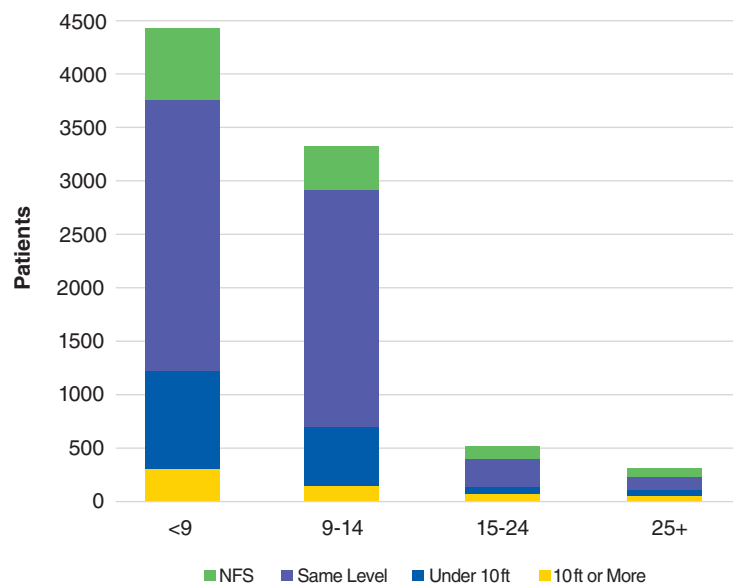
FALLS BY AGE



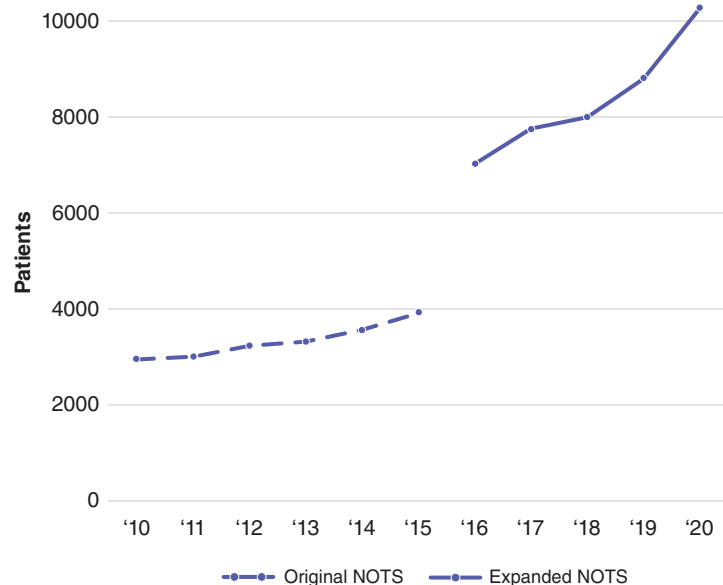
FALLS

Three new Level III trauma centers became operational in 2020. Though there has been an upward trend in falls over the last several years, the addition of new Level III centers likely contributed to the particularly steep increase between 2019 and 2020.

FALLS BY INJURY SEVERITY SCORE (ISS)



FALLS BY YEAR



PREVENTION FOR FALLS FOR THE REGION

WHO DOES WHAT? HOW DID COVID AFFECT INJURY PREVENTION?

As is evidenced by NOTS data, the category of falls has increased every year. Some of this increase is due to the addition of Level III trauma hospitals to the NOTS group. With the addition of these Level III centers, we have better data on how serious the falls are for our region and are now capturing more falls than we have before. When we started to see the uptick in falls, NOTS members realized that something had to be done. In light of Covid we knew that in-person education was not an option, but we wanted a way to reach those who were falling.

NOTS developed a video explaining how falls are a major factor of injury. The video also notes the 6-week course called Matter Of Balance and how taking the course has helped many regain their balance and decrease their likelihood to fall.

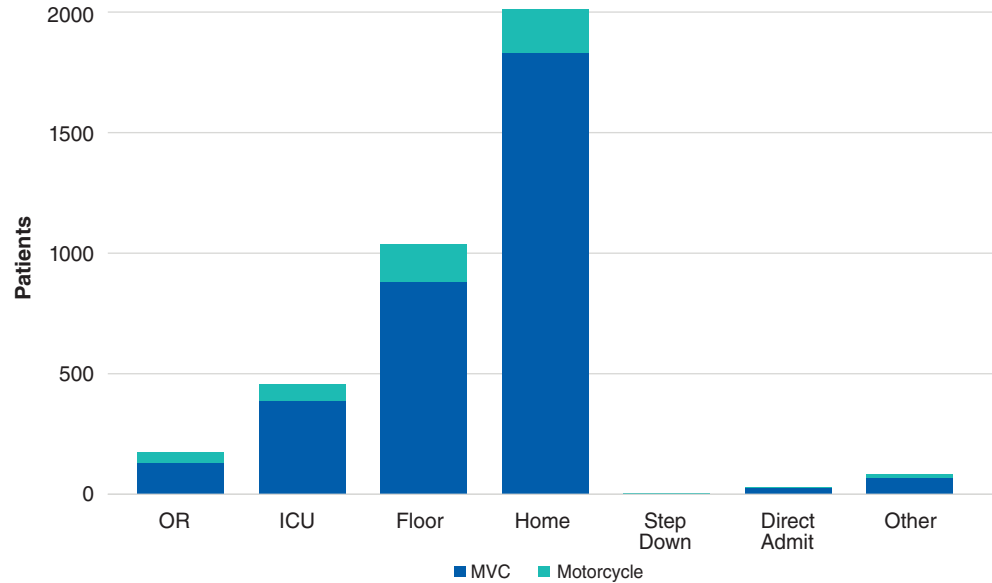
This video can be seen on the NOTS website and around the regional hospitals. The hope of this video is to raise awareness and give those who need help an informative and useful resource.



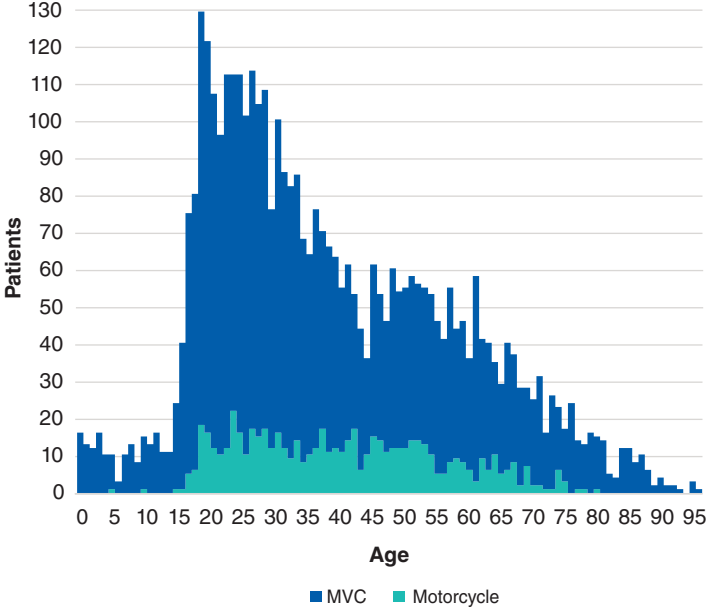
MOTOR VEHICLE AND MOTORCYCLE CRASH



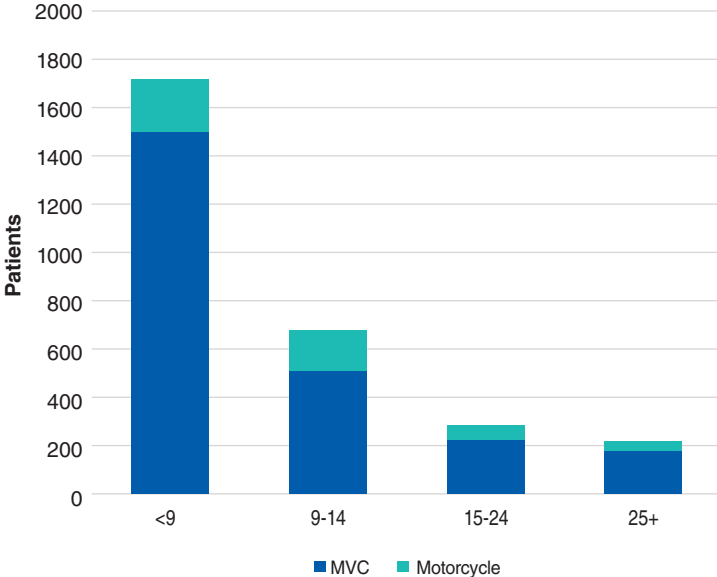
MVC AND MCC BY ED DISPOSITION



MVC AND MCC BY AGE

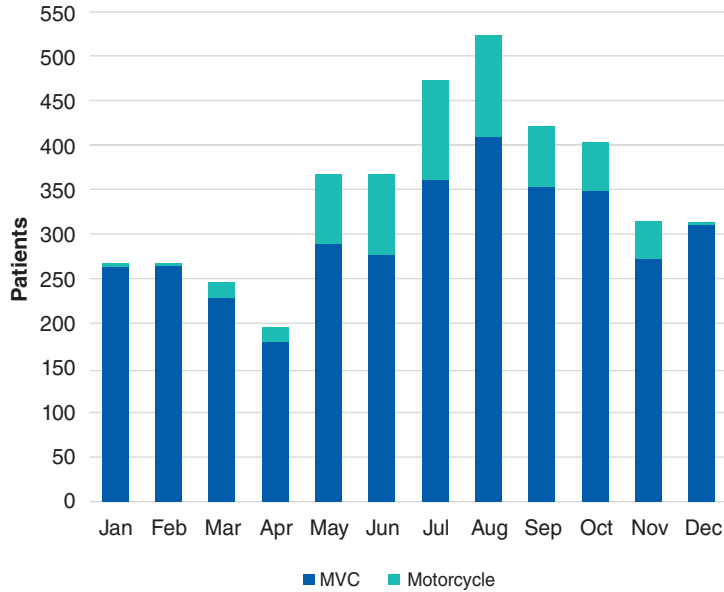


MVC AND MCC BY INJURY SEVERITY SCORE (ISS)

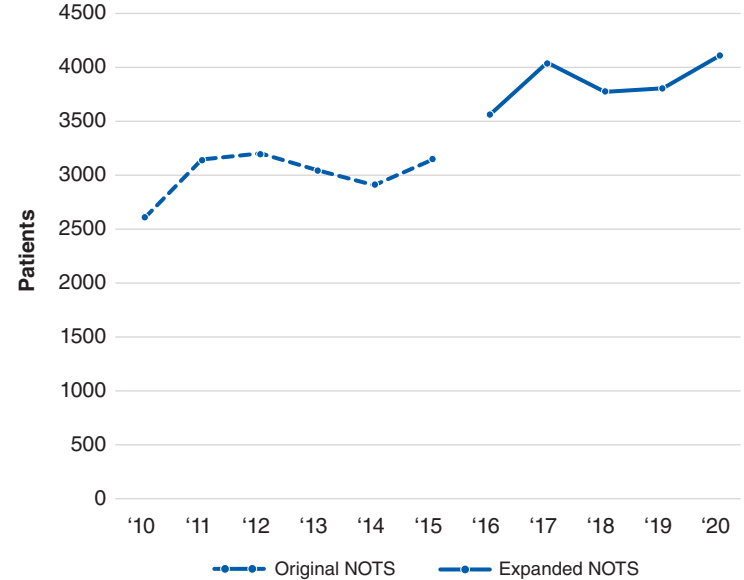


MOTOR VEHICLE AND MOTORCYCLE CRASH

MVC AND MCC BY MONTH



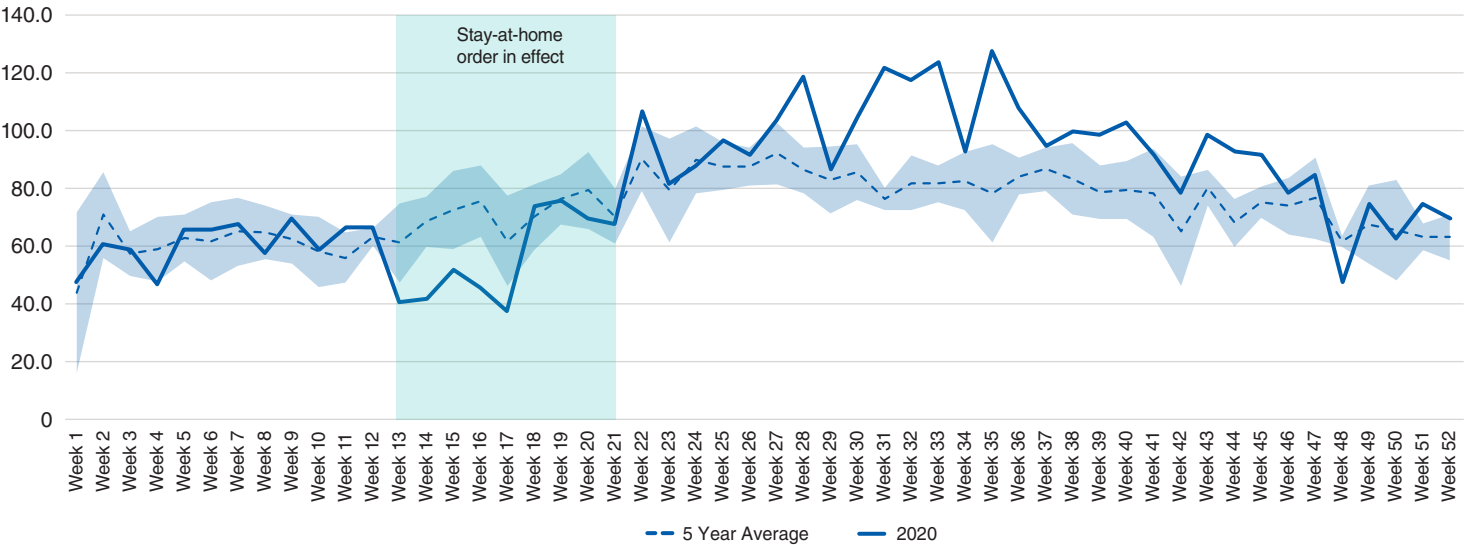
MVC AND MCC BY YEAR



MOTOR VEHICLE/MOTORCYCLE CRASHES AND COVID-19

With a stay-at-home order in effect and continued working from home throughout the year, many suspected that motor vehicle crashes would decrease in 2020. While this was true at the beginning of Ohio's stay-at-home order, motor vehicle and motorcycle crashes then returned to normal levels before increasing well above average for several months following lifting of the order. Overall, MVC and MCC injuries in 2020 were the highest recorded since the inception of NOTS.

MOTOR VEHICLE AND MOTORCYCLE CRASHES BY WEEK (COMPARED TO PREVIOUS YEARS' AVERAGE)



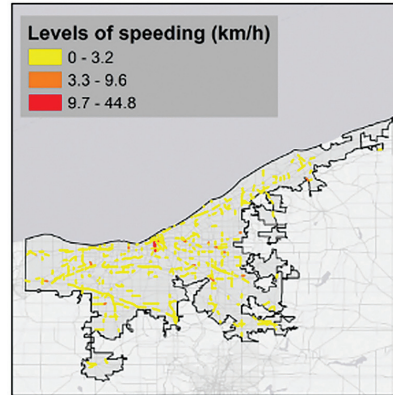
MOTOR VEHICLE AND MOTORCYCLE CRASH

MOTOR VEHICLE/ MOTORCYCLE CRASHES AND COVID-19

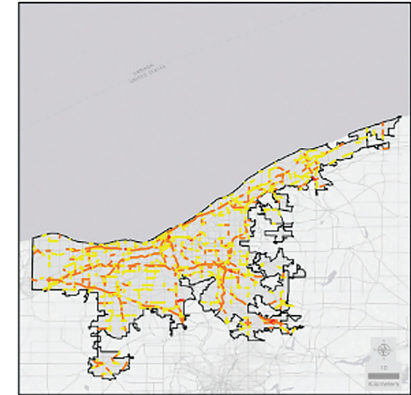
A study from The Ohio State University found a significant increase in traffic speed from 2019 to 2020. Various studies nationally have found that injury severity of MVC patients has increased, a trend that could potentially be explained by increased speed. (Lee et al., 2020)

Within NOTS, 12.8% of MVC patients seen from 2015 to 2019 were severely injured (ISS of 15 or higher). In 2020, that same group made up 16.6% of MVCs. While this increase may seem relatively small, it translates to an additional 92 severely injured individuals.

Cleveland



Before (2019)

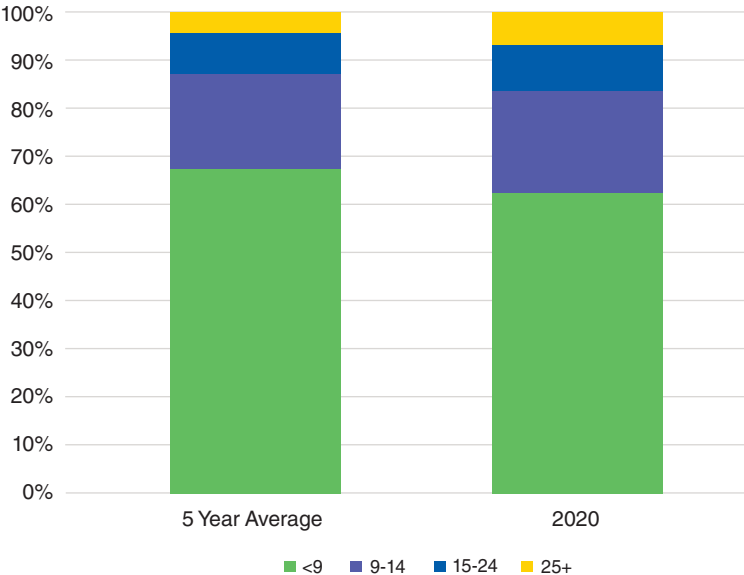


After (2020)

Lee, Jinhyung, Adam Porr, and Harvey Miller. 2020. "Evidence of Increased Vehicle Speeding in Ohio's Major Cities during the Covid-19 Pandemic." Transport Findings, June. <https://doi.org/10.32866/001c.12988>.



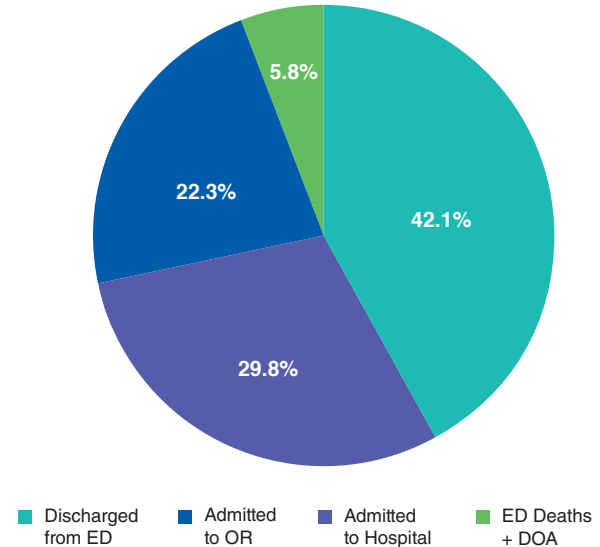
PROPORTION OF INJURY SEVERITY SCORE (ISS)



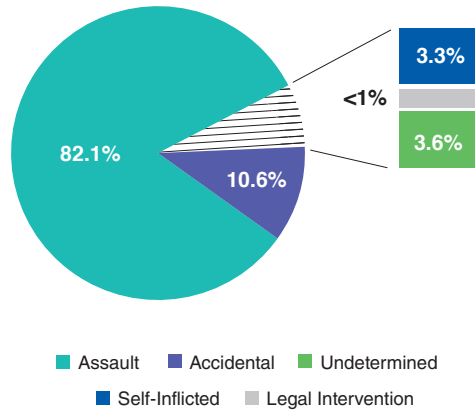
GUNSHOT WOUND

- There were 1,327 GSWs seen in 2020 (compared to 893 in 2019)
- 86% of GSW patients were male
- 42.1% were discharged from the ED
- 29.8% were taken directly to the OR from the ED
- Of those who were admitted, 43% went directly to the OR
- Of those who were admitted, 43% had a stay in the ICU, with an average ICU stay of 4.9 days
- The mortality rate of those who were admitted was 5.9%

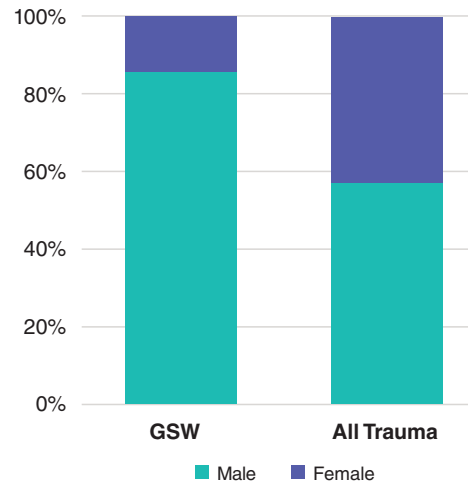
GSW BY ED DISPOSITION



GSW BY INTENT

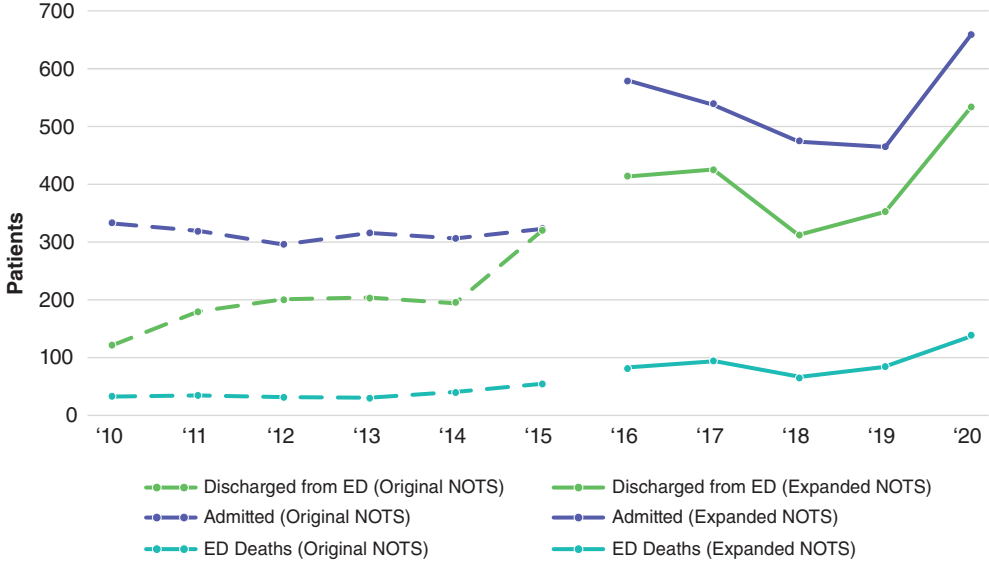


GSW VS. ALL TRAUMA BY GENDER

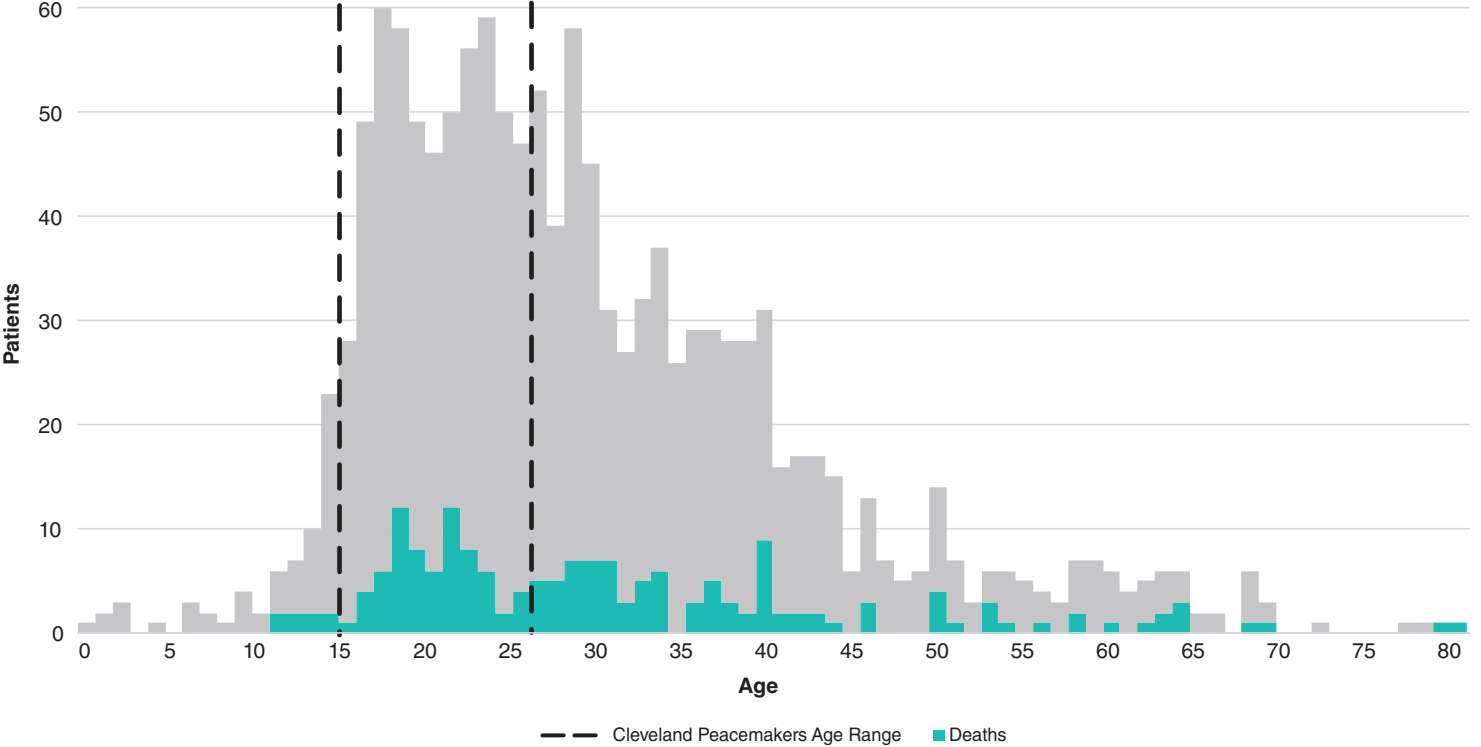


GUNSHOT WOUND

GSW BY YEAR AND ED DISPOSITION



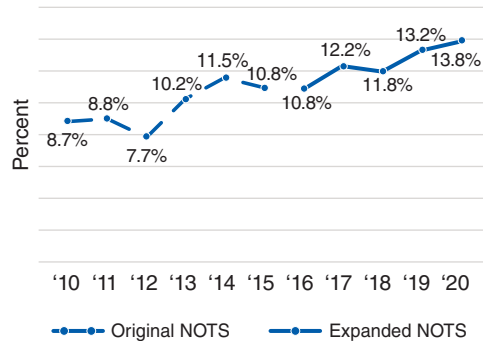
GSW BY AGE



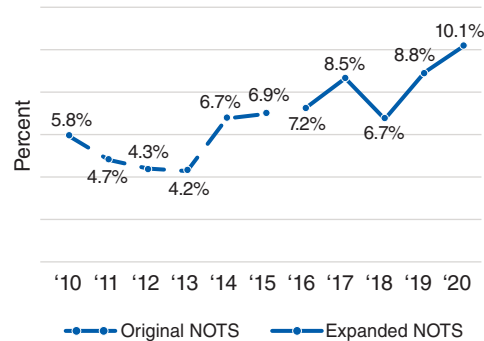
GUNSHOT WOUND

Overall, mortality from GSW increased slightly from 13.2% to 13.8%, from 2019 to 2020. While admitted mortality decreased from 8.4% to 7.5%, ED mortality increased from 8.8% to 10.1%. Since there were far more ED deaths (134) than admitted deaths (49), this resulted in the overall increase.

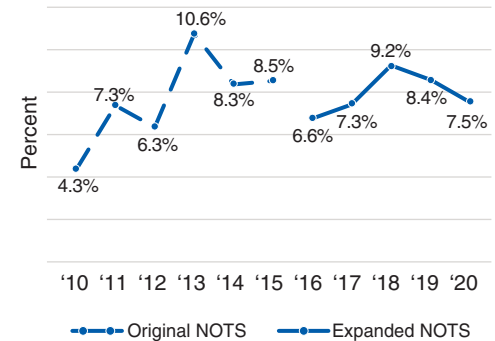
GSW MORTALITY BY YEAR



GSW ED MORTALITY BY YEAR



GSW ADMITTED MORTALITY BY YEAR



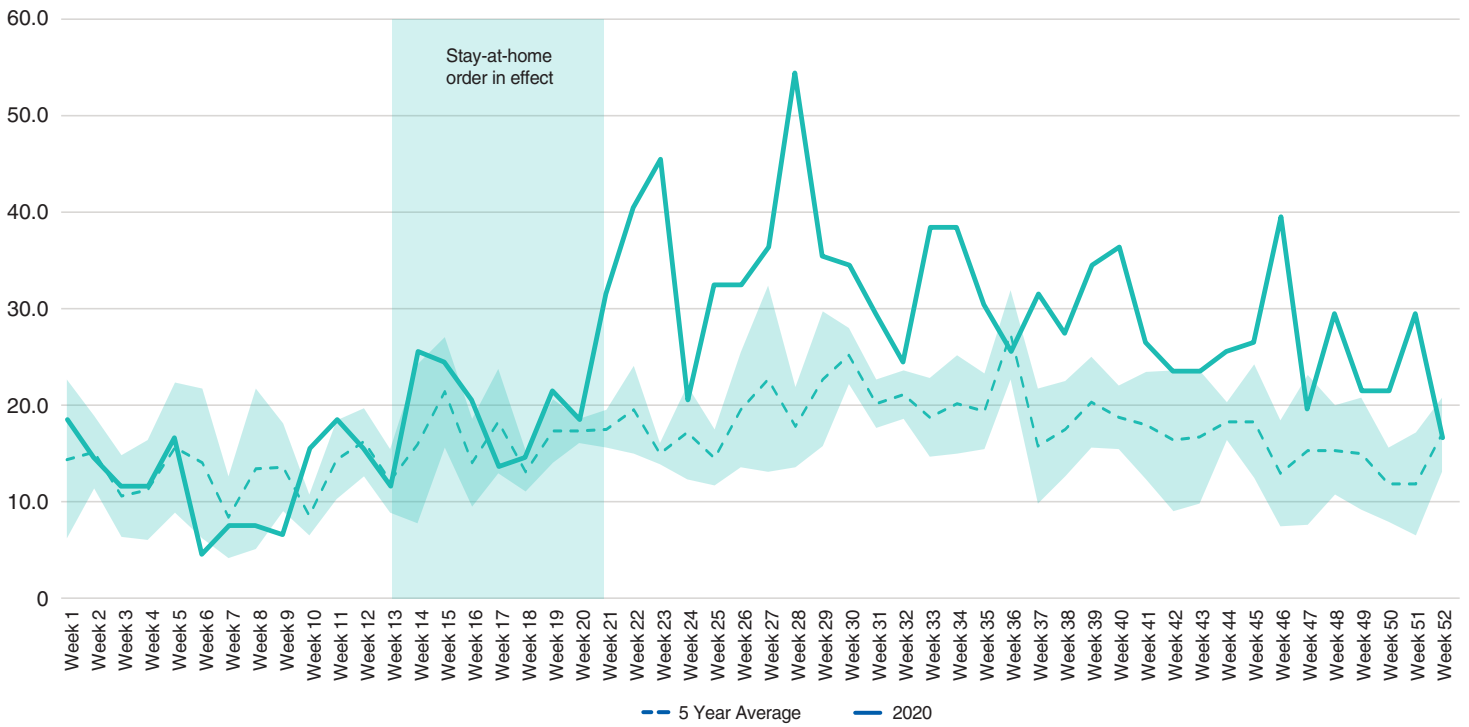
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
ED Deaths	28	26	23	23	35	47	76	89	56	79	134
Admitted Deaths	14	23	18	33	25	27	38	39	43	39	49
Total	42	49	41	56	60	74	114	128	99	118	183
All GSW	483	557	533	550	524	683	1060	1049	838	893	1327



■ (Left to right) Maryum Patterson, Violence Interrupter/Cleveland Peacemakers Alliance; Andrea Martemus-Peters, NOTS Violence Injury Prevention Coordinator; Antonio McMullen, Violence Interrupter/Cleveland Peacemakers Alliance

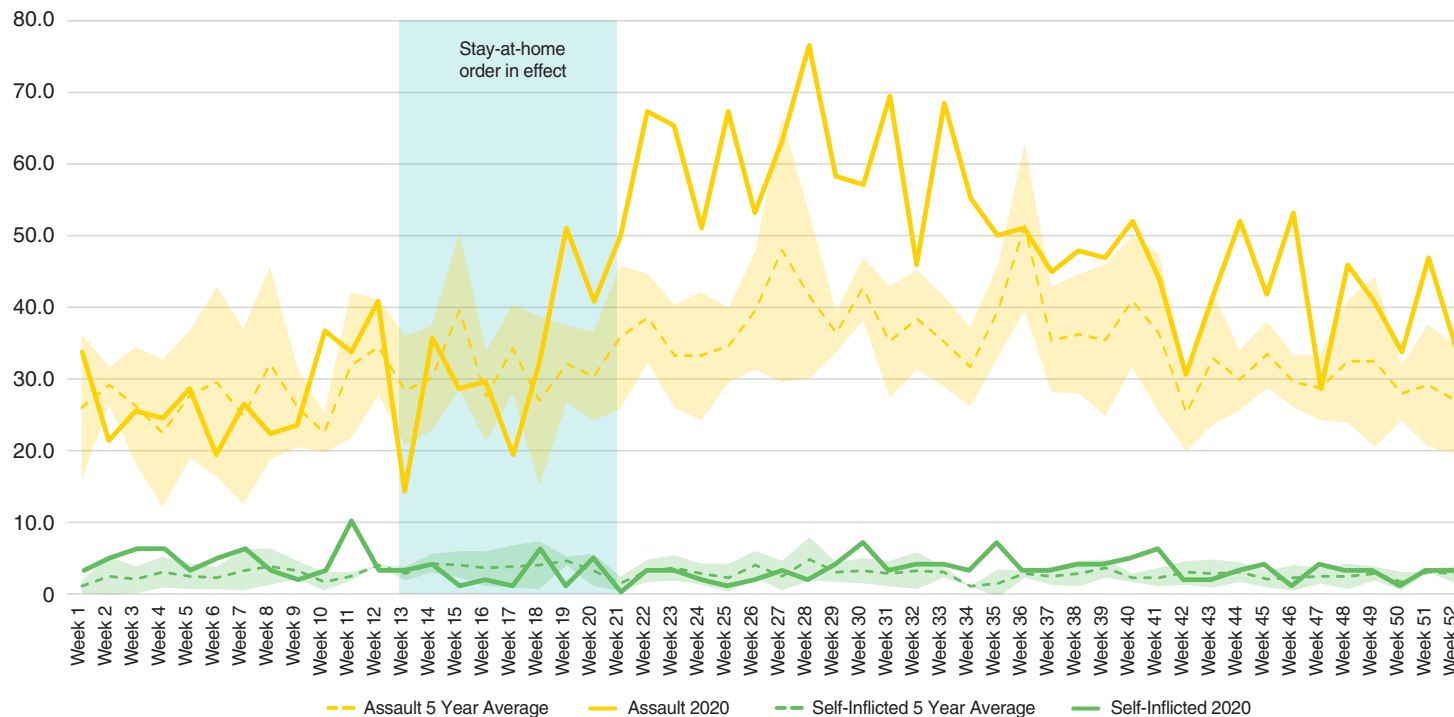
GUNSHOT WOUND AND COVID-19

GSW BY WEEK (COMPARED TO PREVIOUS YEARS' AVERAGE)



NON-ACCIDENTAL TRAUMA

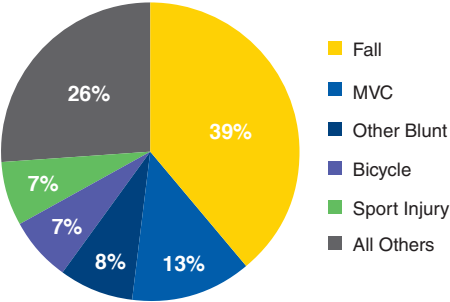
NON-ACCIDENTAL TRAUMA BY WEEK AND INTENT (COMPARED TO PREVIOUS YEARS' AVERAGE)



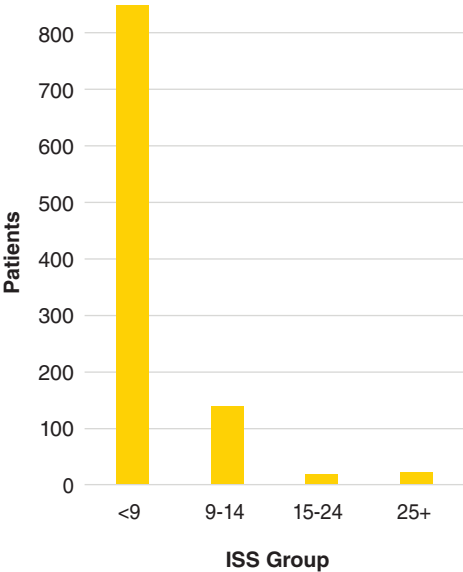
PEDIATRIC AND ADOLESCENT

14 YEARS AND YOUNGER

PEDIATRIC MECHANISM OF INJURY



PEDIATRIC TRAUMA: BY INJURY SEVERITY SCORE (ISS)



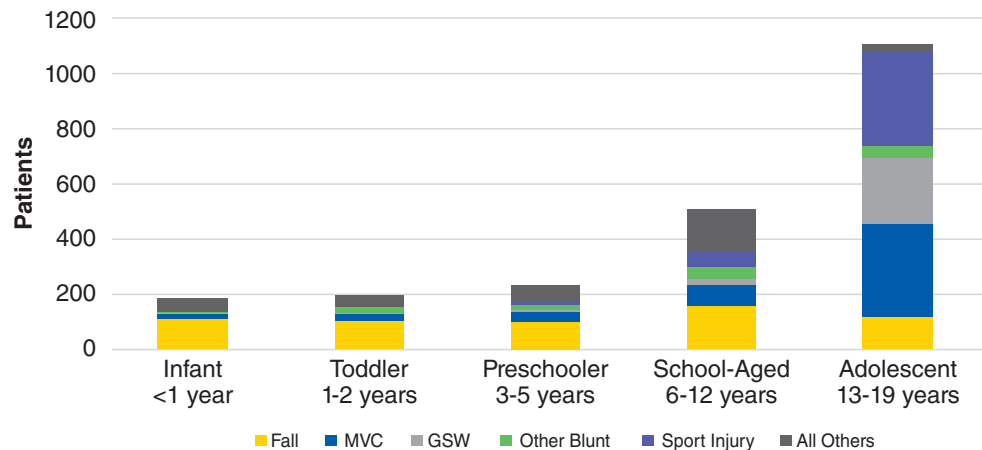
Mechanism Of Injury	Patients
Fall	502
MVC	175
Other Blunt	110
Sport Injury	89
Bicycle	89
Assault	57
Biting	48
Burn	45
GSW	43
MVC vs. Pedestrian	40
Off Road/Other Vehicle	38
Other Penetrating	25
Horse and Rider	17
All Others*	13
Grand Total	1291

**All Others" includes mechanisms with too few cases to be presented on their own: Asphyxiation, Hanging, Motorcycle, Stabbing, Drowning, and Horse and Rider.

PEDIATRIC AND ADOLESCENT

19 YEARS AND YOUNGER

PEDIATRIC MECHANISM OF INJURY BY AGE GROUP



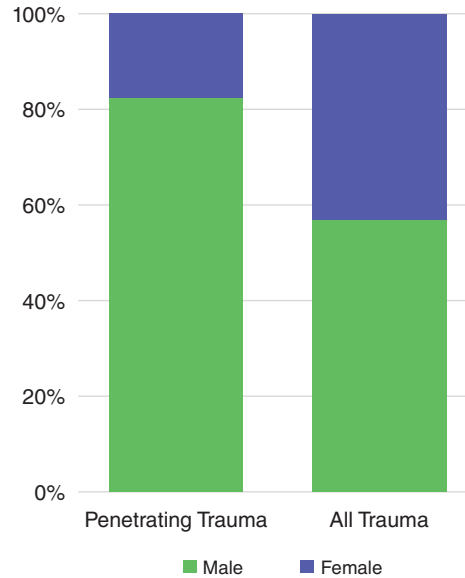
Pediatric Mechanism	Infant <1 Year	Toddler 1-2 Years	Preschooler 3-5 Years	School-Aged 6-12 Years	Adolescent 12-19 Years
Fall	110	102	101	157	116
MVC	18	25	35	77	339
GSW		8		18	235
Other Blunt		23	20	46	47
Sport Injury		11		53	339
All Others	53	42	63	156	27



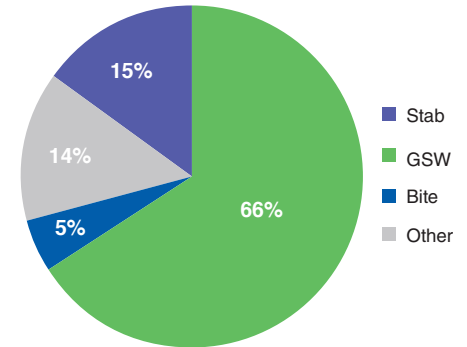
PENETRATING TRAUMA



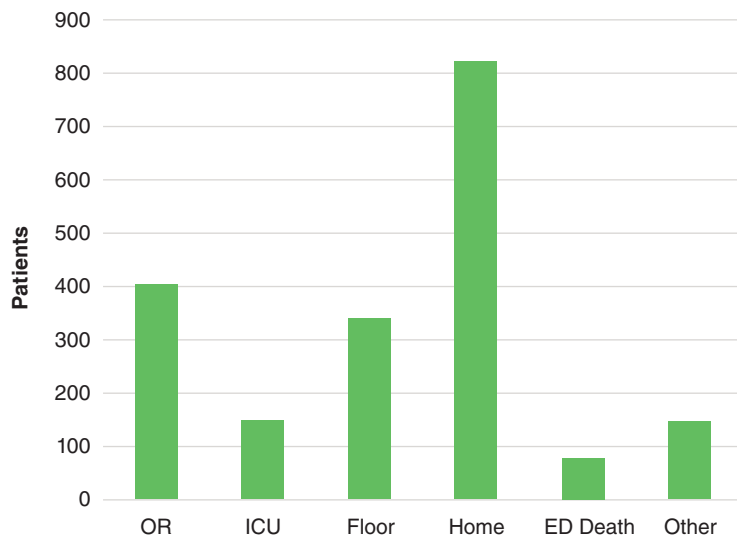
**PENETRATING TRAUMA VS.
ALL TRAUMA BY GENDER**



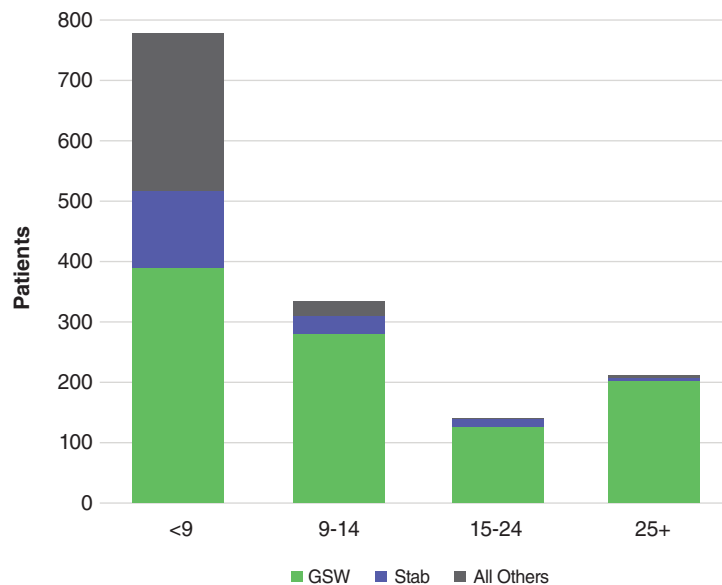
PENETRATING TRAUMA BY TYPE



PENETRATING TRAUMA BY ED DISPOSITION

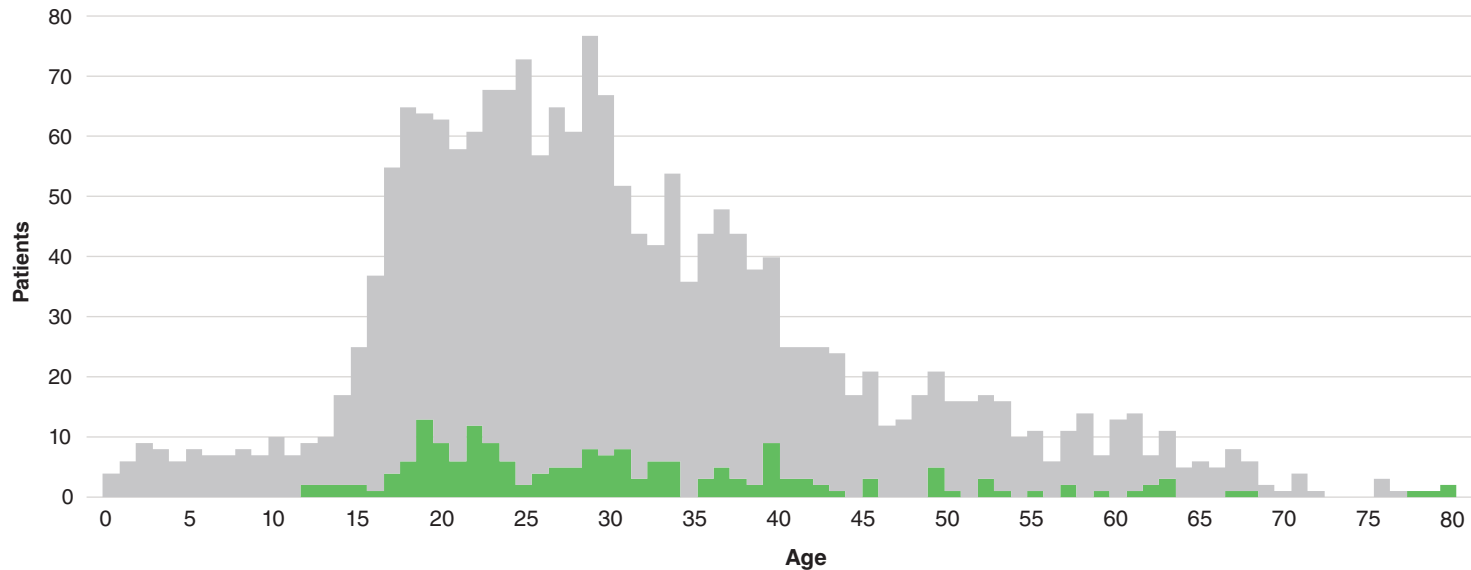


PENETRATING TRAUMA BY INJURY SEVERITY SCORE (ISS) AND MECHANISM

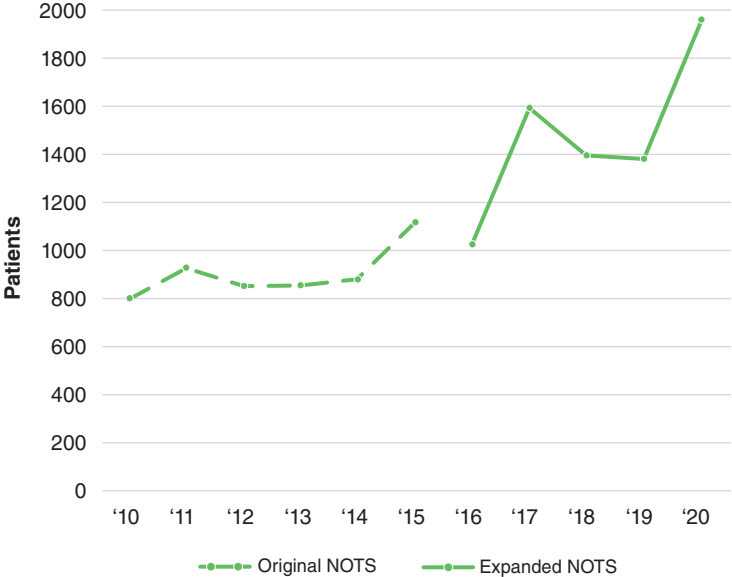


PENETRATING TRAUMA

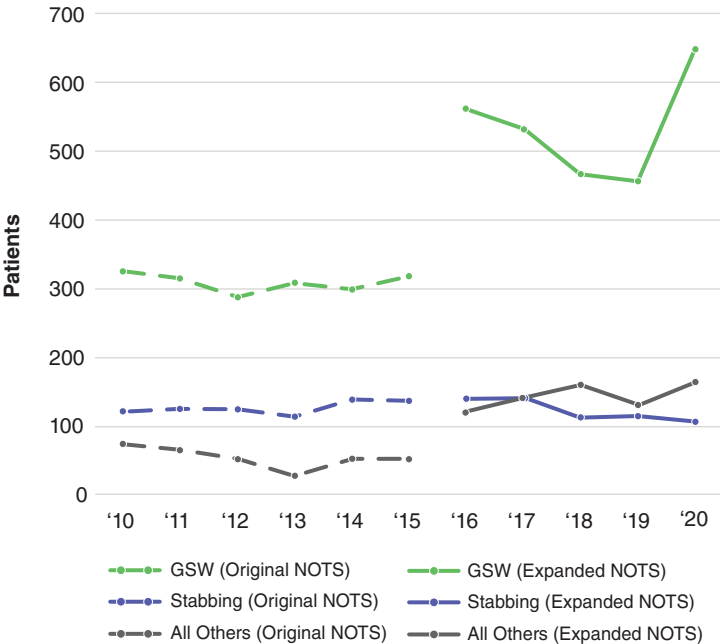
PENETRATING TRAUMA BY AGE



PENETRATING TRAUMA TOTAL BY YEAR

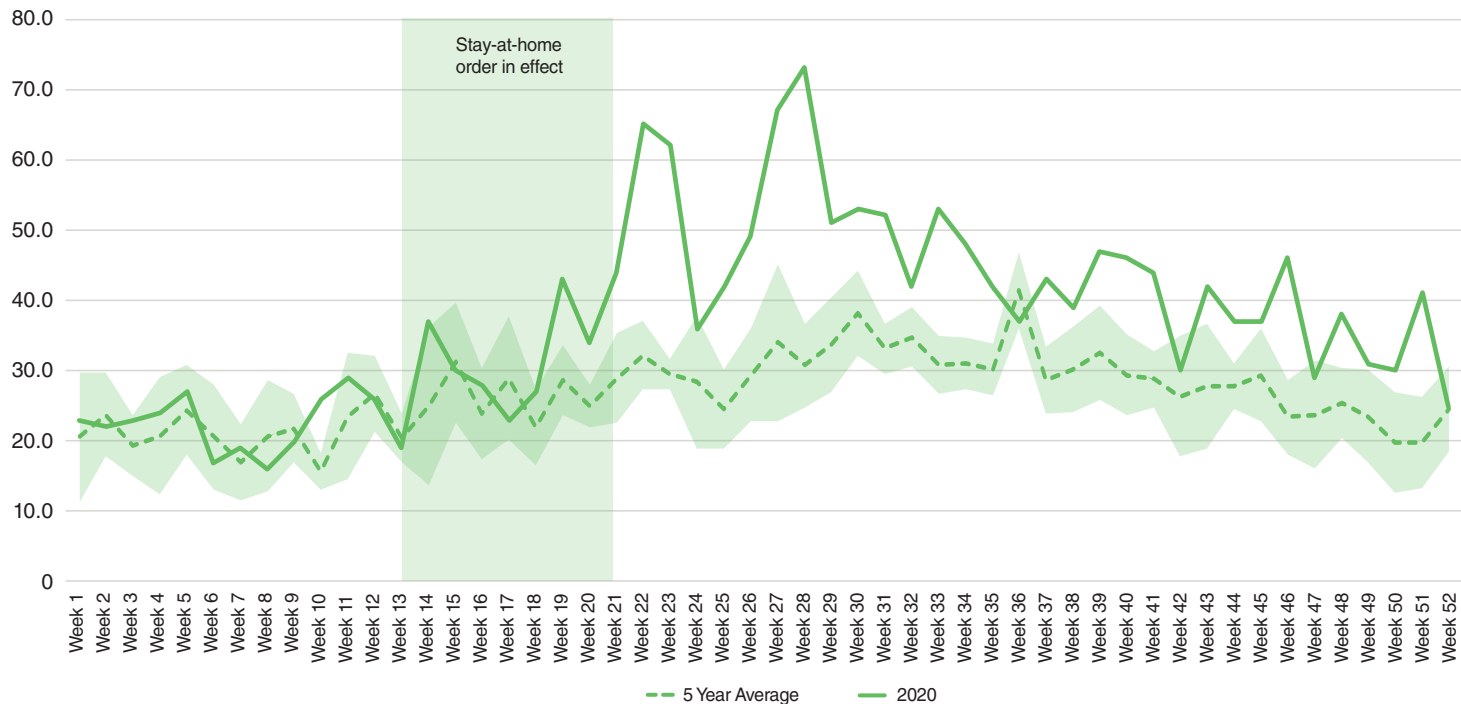


ADMITTED PENETRATING TRAUMA BY TYPE AND YEAR



PENETRATING TRAUMA

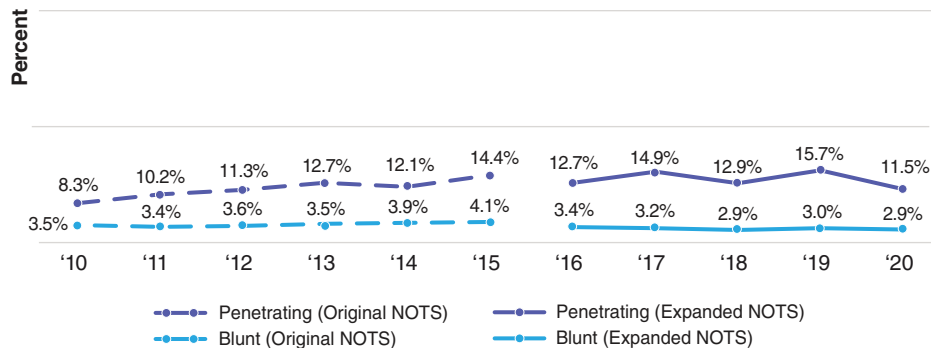
PENETRATING INJURIES BY WEEK (COMPARED TO PREVIOUS YEARS' AVERAGE)



OUTCOMES

This figure shows mortality over time for patients of all Injury Severity Scores (ISS). In 2020, the region saw 10,653 patients with blunt injuries and 979 patients with penetrating injuries. The mortality percentages are not adjusted for injury severity or any other factors. Overall counts of injuries continued to increase since 2018, with the mortality rate for penetrating injuries decreasing and the blunt mortality rate decreasing very slightly between 2019 and 2020.

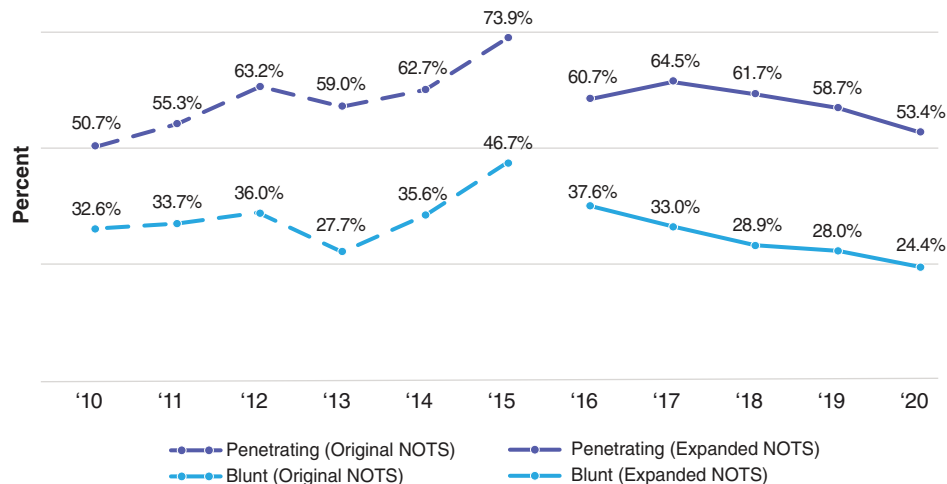
MORTALITY: ALL ADMITTED PATIENTS AND ED DEATHS



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Blunt	4951	4443	4440	4266	4647	4821	8739	9114	8743	9830	10653
Penetrating	637	581	495	479	530	561	896	912	799	788	979

OUTCOMES

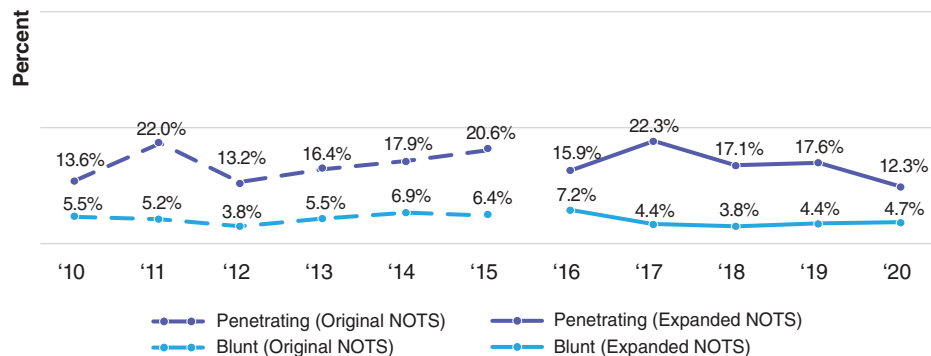
MORTALITY: ADMITTED PATIENTS AND ED DEATHS WITH INJURY SEVERITY SCORE OF 25+



This figure represents the patients with the highest severity of injury: an Injury Severity Score (ISS) of 25 or higher. A large percentage of these patients have life-threatening injuries and a markedly reduced likelihood of survival. A general rule of thumb is that roughly 50% of patients with an ISS \geq 25 do not survive their injuries. In 2020, both blunt and penetrating mortality continued to decrease in this group of patients. Of note, part of the trauma surgeon's job is to respect family and patient wishes and recognize that it is our responsibility to allow people to die comfortably. At this time, we do not monitor how often we honor patient and family wishes to provide comfort care only and withhold life-sustaining therapy.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Blunt	288	249	239	238	236	244	370	479	460	522	577
Penetrating	73	76	76	83	83	88	141	155	120	155	161

MORTALITY: ADMITTED PATIENTS AND ED DEATHS WITH INJURY SEVERITY SCORE OF 15-24

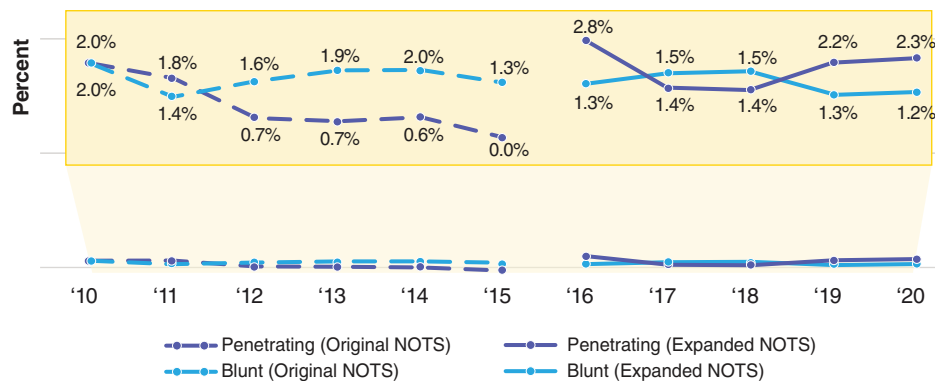


This group represents patients with a moderate severity of injury. At the inception of NOTS, our specific goal was to improve the outcomes of this patient group. Though we may never reduce the number to zero, striving to do that is still our goal. Mortality for blunt injuries increased between 2019 and 2020, while mortality for penetrating injuries decreased markedly.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Blunt	434	501	476	457	467	486	745	857	815	860	935
Penetrating	44	50	53	67	56	68	90	103	111	91	130

OUTCOMES

MORTALITY: ADMITTED PATIENTS AND ED DEATHS WITH INJURY SEVERITY SCORE OF 9-14



Patients with a minor ISS of 9-14 are numerous, while deaths are relatively rare. Deaths in this patient group often have contributing comorbid health conditions. Penetrating mortality increased very slightly between 2019 and 2020, while blunt mortality decreased very slightly.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Blunt	1373	1173	1282	1164	1316	1454	3021	3268	3347	3748	4271
Penetrating	153	165	153	137	171	163	263	294	296	224	308

NOTS VIOLENCE PREVENTION PROGRAM

NOTS AND THE CLEVELAND PEACEMAKERS ALLIANCE

NOTS partnership with the Cleveland Peacemakers Alliance continued without interruption during the Covid-19 pandemic. There were some adjustments made in the way the violence interrupters communicated with patients in the first 90 days of Covid. The Violence Injury Prevention Coordinator communicated regularly with the trauma program managers, social workers, and nurse managers at the hospitals. In addition, the coordinator provided the violence interrupters with PPE, updated hospital precautions, and community resources for testing. The violence interrupters expressed concern and fear for their health and the health of family members.



(Left to right) Myesa Crowe, Executive Director, Cleveland Peacemakers Alliance, Antonio McMullen and Andrea Martemus-Peters

As hospitals limited visitation, the violence interrupters were not allowed inside the hospitals. Communication with patients was conducted via telephone calls to patient rooms, cell phones and FaceTime calls facilitated by the coordinator. Violence interrupters assisted family members and provided crowd control in the hospital parking lot outside the emergency departments.

Cleveland and most cities across the country experienced a high volume of violence relating to Covid-19. Support from individuals who understood the needs of victims of crimes was essential. The uncertainty of Covid-19 escalated loved ones' fears of medical outcomes.

Follow up calls to patients revealed many patients needed assistance with employment opportunities and counseling for PTSD. We also learned that these calls helped patients understand their discharge instructions.

The violence interrupters have assisted patients with access to food distribution resources, rental assistance, and safe housing options. Employment opportunities with locally owned private businesses have helped patients establish economic independence. Art and videography classes have been alternatives offered to individuals to express their artistic skills.



Andrea Martemus-Peters, MSSA, LSW
Violence Injury Prevention Coordinator

NOTS ADVISORY BOARD



Jeffrey A. Claridge, MD, MS, FACS

Division Director of Trauma, Critical Care, Burns
and Acute Care Surgery
The MetroHealth System

Professor of Surgery
*Case Western Reserve University,
School of Medicine*



**Matthew L. Moorman, MD, MBA, FACS,
FAWM, FCCM**

Chief, Division of Trauma, Critical Care,
and Acute Surgery
University Hospitals, Cleveland Medical Center



Robert Wyllie, MD

Chief Medical Operating Officer,
Systemwide Medical Operations,
Associate Chief of Staff, Professor
Lerner College of Medicine, Cleveland Clinic



Christopher Miller, MD, MS

Chair
*University Hospitals Cleveland Medical Center
Department of Emergency Medicine*

Clinical Professor of Emergency Medicine
*Case Western Reserve University,
School of Medicine*



Bernard Boulanger, MD, MBA

Executive Vice President, Chief Clinical,
Officer of The MetroHealth System,
Professor of Surgery,
Senior Associate Dean,
*Case Western Reserve University,
School of Medicine*



Nicole A. Carlton

Cleveland Commissioner
Division of Emergency Medical Services



Bradford L. Borden, MD, FACEP

Chairman
Emergency Services Institute
Associate Chief of Staff
Staff Affairs, Cleveland Clinic



John H. Wilber, MD

Chairman
Department of Orthopaedic Surgery, MetroHealth Medical Center
Professor of Orthopaedics
Case Western Reserve University, School of Medicine



Brendan M. Patterson, MD, MBA

Chair
Department of Orthopaedics, Cleveland Clinic
Professor
Orthopaedics, Case Western Reserve University, School of Medicine



Dan Ellenberger

Director
EMS Institute, University Hospitals, Cleveland



Sharyna C. Cloud M.P.A.

Senior Program Officer
Enterprise Community Partners, Inc.



Brandy Carney

Chief
Cuyahoga County Public Safety & Justice Services

GLOSSARY OF TERMS

Adolescents: Patients ages 13-19 years.

Cause of Death: For the purpose of national mortality statistics, every death is attributed to one underlying condition, based on information reported on the death certificate, and uses the international rules for selecting the underlying cause of death from the condition stated on the death certificate. For injury deaths, the underlying cause is defined as the circumstance of the accident or violence that produced the fatal injury.

Coroner: A person whose standard role is to confirm and certify the death of an individual within a jurisdiction. A Coroner may also conduct or order an inquest into the manner or cause of death, and investigate or confirm the identity of an unknown person who has been found dead within the Coroner's jurisdiction.

Drowning: This category includes injuries from drowning/near drowning and submersion with and without involvement of watercraft.

Emergency Department (ED): A medical treatment facility specializing in emergency medicine and the acute care of patients who present without prior appointment, either by their own means or by that of an ambulance. The emergency department is usually found in a hospital or other primary care center.

ICD-10 Code: The International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) is a system used by physicians and other health care providers to classify and code all diagnoses, symptoms and procedures recorded in conjunction with hospital care in the United States.

Frequency: The number of times an event occurs.

Geriatric: Patient ages 65 and older.

Gunshot Wounds (GSW): This category includes injuries from firearms, including unintentional, suicide, homicide, legal intervention and undetermined intent.

Homicide: The killing or intent to kill of one person by another.

Incidence: The number of instances of illness or injury during a given period of time in a specified population.

Injury: Any unintentional or intentional damage to the body resulting from acute exposure to thermal, mechanical, electrical or chemical energy or from the absence of such essentials as heat or oxygen. According to the Injury Surveillance Guidelines, an injury is the physical damage that results when a human body is suddenly or briefly subjected to intolerable levels of energy. Injury can be a bodily lesion resulting from acute exposure to energy in an amount that exceeds the threshold of physiological tolerance, or it can be an impairment of function resulting from a lack of one or more vital elements (air, water, or warmth), as in strangulation, drowning, or freezing. The time between exposure to the energy and the appearance of an injury is short. The energy causing an injury may be one of the following:

- Mechanical
- Radiant
- Thermal
- Electrical
- Chemical

International Classification for Diseases (ICD): The ICD provides the ground rules for coding and classifying cause of death data.

Injury Severity Score (ISS): The Injury Severity Score (ISS) is an established medical score to assess trauma severity. It correlates with mortality, morbidity and hospitalization time after trauma. It is used to define the term major trauma. A major trauma (or polytrauma) is defined as the Injury Severity Score being greater than 15.

Major Trauma: A patient with injuries that result in death, intensive care admission, major operations of the head, chest or abdomen, a hospital stay of three or more days, or an ISS of greater than 15.

Minor Trauma: A patient who is entered into the trauma system, has an ISS of less than or equal to 15, and survives until hospital discharge.

Mechanism of Injury (MOI): The manner in which a physical injury occurred (e.g., fall from a height, ground-level fall, high- or low-speed motor vehicle accident, ejection from a vehicle, vehicle rollover). The MOI is used to estimate the forces involved in trauma and, thus, the potential severity for wounding, fractures, and internal organ damage that a patient may suffer as a result of the injury.

Mortality: Deaths caused by injury and disease. Usually expressed as a rate, meaning the number of deaths in a certain population in a given time period divided by the size of the population.

Morbidity: Number of persons, nonfatally injured or disabled. Usually expressed as a rate, meaning the number of nonfatal injuries in a certain population in a given time period divided by the size of the population.

Pedestrian: This category includes injuries among pedestrians hit by a train, a motor vehicle while not in a traffic, or another means of transportation.

Pediatric: Patients ages 0-15 years.

Penetrating: This category includes injuries caused by cutting and piercing instruments: knives, swords, daggers, power lawn mowers, power hand tools, household appliances.

Risk Factors: Characteristics of people, behavior or environment that increase the chance of disease or injury occurring. Examples: alcohol use, poverty, gender.

Struck By/Against: This category includes injuries resulting from being struck by or striking against objects or persons. This category includes being struck (unintentionally) by a falling object, being struck or striking objects or persons (sports), and injuries sustained in an unarmed fight or brawl.

Years of Potential Life Lost (YPLL): The concept of years of potential life lost involves estimating the average time a person would have lived had he or she not died prematurely.



NOTS 2021 Annual Report

Written By: Danielle Rossler, MBA, BSN, RN
Trauma Program Manager
Glen Tinkoff MD, FACS, FCCM
Medical Director

Data By: Olivia Houck, MPH
Data Specialist

Edited By: A.M. Design Group

Ancillary Support By: Tod Baker, EMS-P
EMS Coordinator
Andrea Martemus-Peters, MSSA, LSW
Violence/Injury Prevention Coordinator

■ www.northernohiotraumasystem.com



■ (Left to right) Dr. Tinkoff, Andrea Martemus-Peters, Olivia Houck, Danielle Rossler, Tod Baker.