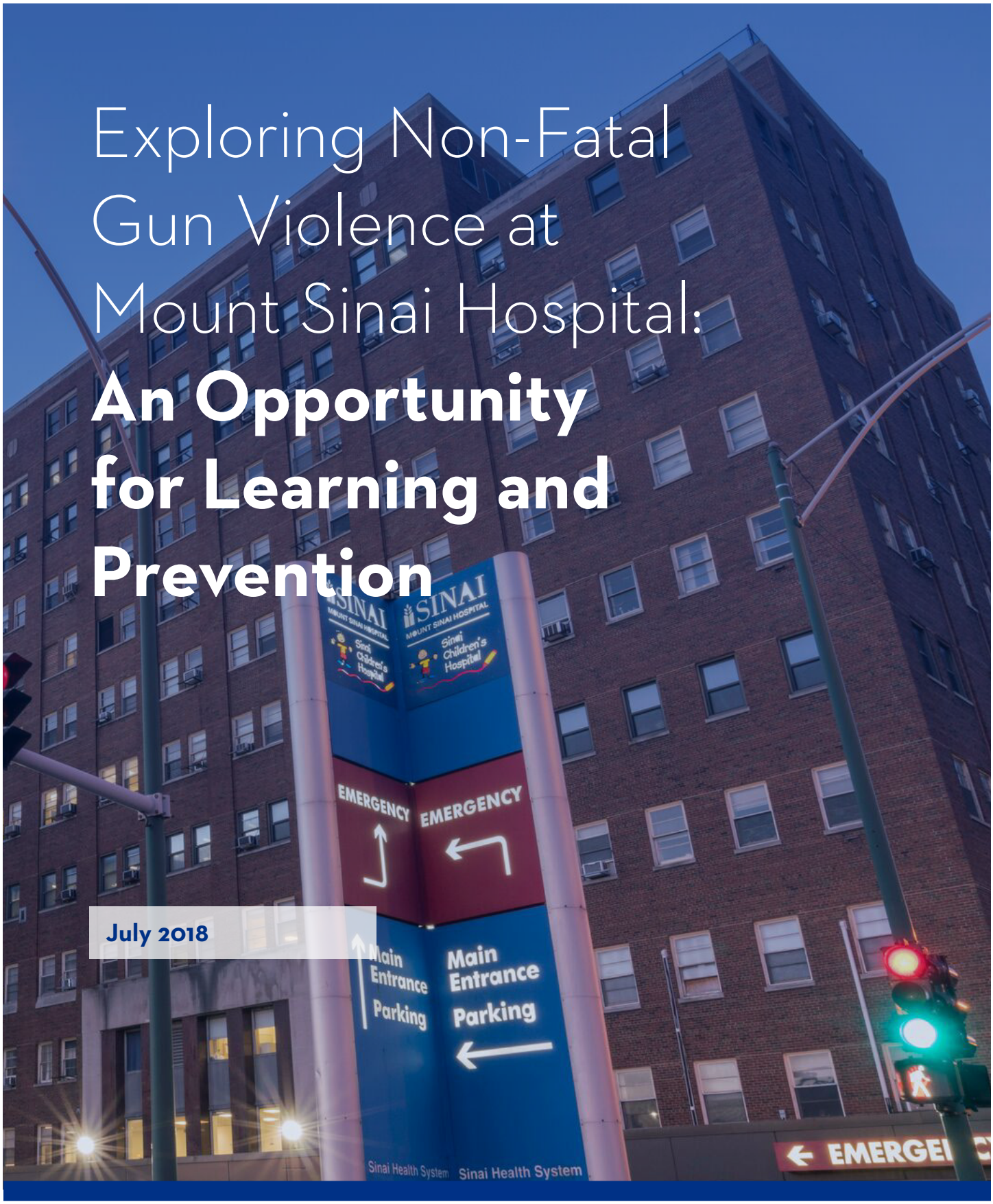

Exploring Non-Fatal Gun Violence at Mount Sinai Hospital: **An Opportunity for Learning and Prevention**

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Contents

Foreword

The Jewish United Fund of Metropolitan Chicago (JUF) is an organization that impacts every aspect of local and global Jewish life by providing human services for Jews and others in need, creating Jewish experiences and strengthening Jewish community connections. Although JUF's mission is to strengthen the Jewish community, their programming and grant making affects Chicagoans in every demographic and community.

For 118 years, JUF has been an anchor of support, addressing a wide range of needs. Annually, JUF serves over 500,000 Chicagoans of all faiths at every stage of life, giving people in crisis tools to turn their lives around, coming together as a community to strengthen and lift up people in need.

In 2014, JUF founded their Breakthrough Fund initiative, a grant program to encourage smart, strategic growth and creative program development in Chicago's Jewish community. The JUF Breakthrough Fund provides approximately $1 million in grants each year to support leading-edge programs, capacity-building efforts, planning, research and development initiatives, and new approaches that address the wide array of needs, interests, individuals, and identities that compose Chicago's vibrant and diverse Jewish community as well as Jewish communities in Israel and other areas overseas.

Sinai Urban Health Institute (SUHI) was one recipient of the Breakthrough fund grant in FY18. SUHI's intention was to strengthen JUF's mission by: 1) Describing the depth of the gun violence problem at Mount Sinai Hospital and Schwab Rehabilitation, 2) Informing Sinai violence prevention strategy, and 3) creating professional communications materials to deepen public and healthcare professional knowledge about the experiences of non-fatal gun violence injury victims.

SUHI is a unique, nationally-recognized community research center. Located within the Sinai Health System, SUHI strives to achieve their mission by employing a community-driven process to identify and address inequities in some of the most underserved communities in Chicago. Since their founding in 2000, they have grown to a diverse staff of approximately 35 epidemiologists, project managers, research assistants, and community health workers. While the majority of our funding comes from private foundations, like JUF, and government grants, they are increasingly being called upon to provide practical, evidence-based consulting services to community-based organizations, health care systems, and foundations. The work is focused on empowering our partners, including community leaders, residents, and the public health workforce, with the knowledge and tools necessary to meaningfully improve health.

Executive Summary

The overall goal of this project was to expand our understanding of the breadth and depth of non-fatal gun violence in the Mount Sinai Hospital service area. The importance of this work cannot be understated. Mount Sinai Hospital (MSH) sees a large portion of gun violence in its emergency department (ED), and being only one of five Level 1 Trauma Centers in Chicago, the gun violence seen at MSH is a large portion of what Chicago experiences overall.

Just describing the depth of gun violence however is not enough. This project went a step further by asking the people who experience gun violence – both staff and patients – what their experiences are, what MSH and Schwab Rehabilitation (referred to as "Sinai") do well for gun violence patients and where they can improve. Sinai is thoroughly committed to the community they serve and it is our belief that by understanding gun violence a little better we can begin to make significant strides to impact it in a positive way.

To impact gun violence, specifically non-fatal gun violence, in our primary service area, Sinai is working tirelessly to achieve the following goals:

1

To understand healthcare experiences and outcomes of Sinai patients treated for non-fatal violent injuries, and challenges transitioning to home and community

2

To identify opportunities to support victims in their transition, reduce further violence, and assess barriers and needs to inform a Sinai violence prevention strategy

3

To build the capacity of SUHI by strategically positioning it as a thought leader in violence prevention research

Introduction

Sinai is located at the epicenter of Chicago's gun violence epidemic.

Homicide rates in some of our neighborhoods are ten times higher than the national average. Last year, there were 787 homicides, which is a 58% increase from 2015.[2] Additionally, in 2017, Sinai cared for over 2,700 trauma victims, approximately 800 of which were victims of non-fatal gun violence injury.

Sinai's community is disproportionately affected by violence, affecting mostly Non-Hispanic Black men, who reside on the Westside or Southside of Chicago. More often than not, these men have had some prior encounter with the criminal justice system.[3]

Most gun violence researchers have relied on public databases of information provided by the FBI, local police departments, the American Community Survey, and other useful repositories of information. However, this information is not specific enough to fill in the large gaps in violence and trauma research we need at the community level. Furthermore, most research and data repositories focus on fatal violent trauma. As a result, there are large gaps in non-fatal gun violence and trauma data.

While there is a great deal of information related to fatal gun violence incidences, such as the victim's relationship to the perpetrator, victim's race/ethnicity, victim's age, and location of injury, similar information for victims of non-fatal gun violence crime is more sporadic. To better understand rampant community violence, we need to dig into the experiences of the victims of non-fatal gun violence who return to the community.

Sinai sees non-fatal gun violence research as a call to action since Sinai responds to some of the most violent traumas in Chicago. Sinai has collected over 250 data points on each patient that has come through our Trauma Center for the last 12 years. This call to action, first needs to be grounded in a deep understanding of what the non-fatal gun violence landscape looks like, which is at the crux of this report.

Specifically, this report will cover the following:

1. **Background** will provide an overview of gun violence in the United States, Chicago, and Sinai's primary service area.
2. **Non-Fatal Gun Violence** is a big issue throughout the Westside of Chicago. This section will give an overview of the impact the gun violence epidemic has had on the Sinai Health System.
3. **Trends in non-fatal gun violence at Mount Sinai Hospital** will showcase what non-fatal gun violence looks like at Mount Sinai Hospital. This section will explore the methodology and results of our data analysis.
4. **MSH Response to Gun Violence** will explore the process by which Mount Sinai Hospital responds to non-fatal gun violence.
5. **Schwab Response to Gun Violence** will explore the process by which Schwab Rehabilitation responds to non-fatal gun violence.
6. **Discussion** will look at what non-fatal gun violence victims face after they've been injured, and where gaps exist in the hospital's response to this vulnerable population's needs.
7. **Recommendations** will be presented as tangible changes we can make as a healthcare system in response to gun violence.

Background

The frequency and impact of gun violence injury makes it an important public health problem. While many initiatives and programs have been funded to combat the effects of gun violence, there have been very few places in the United States where gun violence has decreased or diminished. While much of the public narrative centers on fun violence fatalities, the number of non-fatal gun violence injuries far exceeds fatal injuries. We believe this is important research, as non-fatal gun violence injuries are often overlooked, but can have a greater effect on the economics, mental health, and social issues of communities.

United States

Non-fatal gun violence injury rates in the United States increased between 2001 and 2013 with approximately 921,613 non-fatal gun violence injuries, as compared with 406,946 fatal gun violence injuries.[4] Data on gun violence injury from the National Electronic Injury Surveillance System (NEISS) shows that between 2010 and 2012, emergency departments (ED) in the US treated 201,591 persons with non-fatal gun violence injuries, of those, 72% were under the age of 35, 89% were male, and nearly 37% were Non-Hispanic or Hispanic Black.[5]

Gun violence affects lives not just physically, but mentally, socially, and financially, as well. Researchers believe that gun violence costs Americans $8.6 billion each year.[6] This is for direct costs which includes emergency care and any long-term medical care, and indirect costs which is comprised of losses to employers, lost income, and quality of life impact.[7] Non-fatal gun violence often ends up being much more expensive than fatal gun violence due to years of ongoing medical and rehabilitation treatments.[8] On average, each American pays more than $700 per year for the cost of gun violence, which is more than the annual cost of the entire Medicaid program.[9]

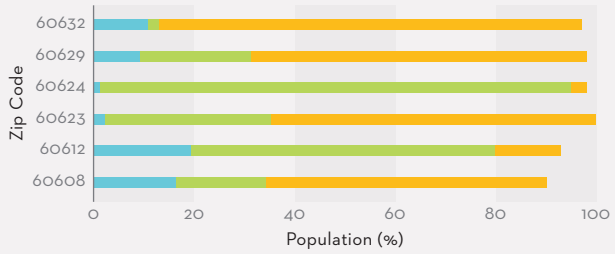
There are also costs that will never be successfully calculated, such as the cost of fear and stunted economic growth. When a neighborhood is plagued by gun violence, people are reluctant to spend time or money in that neighborhood, there are lost business opportunities, and residents will ultimately move, driving property values down.[10] According to Philip Cook, a professor of economics and sociology at Duke University and the author of "Gun Violence: The Real Costs," those who live in neighborhoods with high rates of violence have a diminished quality of life compared to those who live in safer neighborhoods, and often have to work harder in order to keep themselves and their families safe. Residents of high-violence neighborhoods are also known to have higher rates blood pressure and anxiety.

Chicago and Mount Sinai Hospital

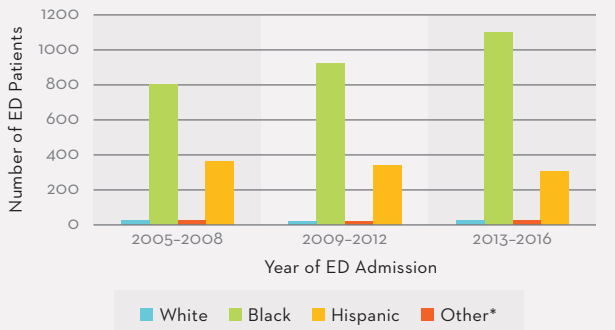
Chicago is made up of 77 community areas that vary significantly in socioeconomics, race, and opportunity. One neighborhood in particular, North Lawndale (zip code 60608), is considered one of the most dangerous neighborhoods in the entire city, seeing 7% of gun violence overall. The residents of North Lawndale are primarily Non-Hispanic Black (89%) with a median age of 29; 55% of the population makes less than $25,000 per year. North Lawndale is home to MSH, a safety net hospital which serves a diverse area of about 1.5 million people. The MSH ED is a Level 1 Adult Trauma Center, providing care to approximately 50,000 patients each year and is one of just five trauma centers in Chicago.

Considering the size of Chicago's population, and the limited number of level 1 trauma centers serving its most vulnerable communities, it is accurate to say that MSH sees a large percentage of the total gun violence that occurs in Chicago.

Mount Sinai Hospital Primary Service Area (Zip Code)
Racial and Ethnic Distribution



Number of Non-Fatal Gun Violence ED Patients by Year



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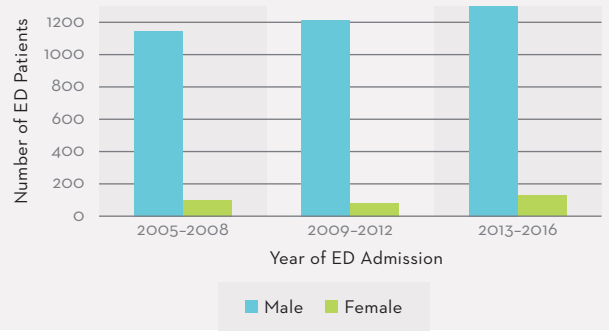


Gun Violence and Hospitals

Non-fatal gun violence injuries cause significant burden on individuals. Those who have been hospitalized for a gun violence injury may have to spend additional time in a rehabilitation facility as well as endure substantial morbidity and poor quality of life long after discharge. Although research tends to focus on the consequences of fatal gun violence injuries, there is extensive opportunity to better understand the demographic and clinical outcomes from non-fatal gun violence injury. With a deeper grasp of who experiences non-fatal gun violence injuries, public health programming will be able to most effectively improve the health and well-being of urban areas plagued by firearm violence. Hospital EDs are an integral place to assess the incidence of non-fatal gun violence injury since the majority of those injured will have to go through an ED to be treated in some capacity. Obtaining data on non-fatal gun violence victims is a challenge, as some states do not track non-fatal gun violence injuries as well as they do gun violence fatalities. As stated previously, the majority of gun violence victims are not fatally injured, and about 80% of those injured are hospitalized.[12] Hospitals are imperative to the gun violence narrative, as their EDs and inpatient units see the majority of gun violence victims. Between 2003 and 2013, the annual rate of hospital admissions due to gun injuries was 30,617 people. More than 80% of these hospitalizations were among those aged 15-44. Rates were nine times higher for males than females and nearly ten times higher for Non-Hispanic Black than White individuals. Of the injuries in which the type of gun was known, 70% were from handguns.[13]

Non-Fatal Gun Violence

The following section will provide an overview of the impact that the gun violence epidemic has had on Sinai. To do this, we will look at:

- Trends in non-fatal gun violence at Mount Sinai Hospital
- Mount Sinai Hospital process for responding to gun violence
- Schwab's process for responding to gun violence patients appropriate for rehabilitation medicine

Trends in Non-Fatal Gun Violence at Mount Sinai Hospital

Overview

To develop a descriptive analysis of non-fatal gun violence in Chicago, we conducted a secondary analysis of hospital patient data that was extracted from the Illinois Department of Public Health Trauma Registry (IDPHTR). The IDPHTR is a mandatory trauma reporting system for all Illinois trauma centers. We collected IDPHTR data for any MSH patients who were admitted through the ED or treated in the ED for at least twelve hours from January 2005 to December 2016.

Patients were identified by an ICD-9 primary eCode injury category of accident, assault, undetermined intent, suicide or self-inflicted injury, and legal intervention by firearm. Patients were excluded if the record had a discharge status of "morgue", "funeral home", "medical examiner", or "coroner." Patient data were divided into three time periods: 2005-2008, 2009-2012, 2013-2016.

ICD-9 firearm injury eCode categories and respective eCodes

Firearm ICD-9 primary eCodes

Category	eCodes
Accidents	E922.0; E922.1; E922.2; E922.3; E922.8; E922.9;
Assault	E965.0; E965.1; E965.2; E965.3; E965.4;
Undetermined intent	E985.0; E985.1; E985.2; E985.3; E985.4;
Suicide or self-inflicted injury	E955.0; E955.1; E955.2; E955.3; E955.4; E955.9;
Legal intervention	E970

Variables

We examined temporal trends in the following variables over the three identified time periods:

1. Patient age
2. Gender
3. Race and ethnicity
4. Chicago metropolitan area region of injury
5. Cause of firearm related injury
6. Place of injury

Chicago metropolitan area region of injury was determined by scene of injury zip code. Scene of injury zip codes were grouped into Chicago community areas, and the Chicago community areas were further grouped into Chicago metropolitan area regions: Westside, South/Southwest side, and other. We did our best to estimate Chicago metropolitan area regions for regions that crossed over multiple zip codes. The Chicago metropolitan area region that contained the larger area of the zip code retained the zip code's total population. The "Other" category includes zip codes located in the city of Chicago and in its adjacent suburbs.

Chicago metropolitan area zip codes

Chicago Area	Zip Codes
Westside	60607; 60608; 60610; 60612; 60622; 60623; 60624; 60639; 60644; 60647; 60651
South/Southwest Side	60609; 60615; 60616; 60617; 60619; 60620; 60621; 60629; 60632; 60636; 60637; 60638; 60649; 60652; 60653
Other	60005; 60062; 60104; 60130; 60153; 60155; 60301; 60402; 60409; 60419; 60426; 60429; 60453; 60455; 60461; 60473; 60534; 60563; 60601; 60605; 60611; 60618; 60625; 60626; 60627; 60628; 60630; 60633; 60634; 60640; 60641; 60643; 60648; 60658; 60659; 60664; 60704; 60804; 60805; 60827; 63101;

Results

There were a total of 3,962 non-fatal hospitalizations due to gun related injuries at MSH between 2005 and 2016. The average patient age overall was 25.2 years with little difference in mean age or distribution of age across time periods. Overall, non-fatal hospitalizations were most frequent among those aged 16-24 (CI=50.9, 54.1)1 and 25-34 (CI=26.1, 28.9). The number of non-fatal hospitalizations decreased with increasing age.

Overall, there were more non-fatal hospitalizations among males than females. There were significant racial/ethnic differences in non-fatal hospitalizations between the three time periods (p=<.001). Overall, the Non-Hispanic Black population was most affected by non-fatal gun violence injuries. Blacks being hospitalized increased from 65% of all visits in 2005-2008 to 75% of all visits in 2013-2016, despite the fact that only 50% of MSH patients overall are Black.

Between the three time periods, significant differences in cause of injury (p=<.001) and location (p=<.001) were noted. Non-fatal gun violence injuries due to assault were most common, and increased by 15.9% from 2009-2012 to 2013-2016. Injuries due to gun related accidents decreased by 32.3% during the same time period, and accounted for 7.3% (95% CI=6.5, 8.1) of total gun related injuries.

The majority of the injuries took place on the Westside of Chicago and on the South/Southwest sides. Additionally, there was an increase of hospitalizations on the Westside and South/Southwest sides of Chicago by 68.1% and 117.5%, respectively, from the time period 2005-2008 to 2013-2016. Overall, gun related injuries occurred mostly in the streets and on highways (CI=67.8, 70.6), and least in public buildings (CI=1.2, 2.0).

[1]All confidence intervals set to 95%

Mount Sinai Hospital Response to Gun Violence

Overview

As stated above, MSH is located in North Lawndale, and provides services to individuals throughout an even larger service area. To garner a better understanding of the process that takes place for victims recovering from gun violence, interviews took place throughout 2018 with an Emergency Medicine physician, social worker, Emergency Department director, and Emergency Department trauma coordinator.

Trauma Response

There are two pathways a patient who has experienced a gun violence injury may enter the ED. A patient may come in on their own volition (either walk into the ED or be dropped off via a private car), or a patient may be picked up by EMS and transported to MSH via ambulance. A Code Yellow, MSH's trauma code, is initiated by an emergency communications registered nurse (ECRN) once they receive a call from the EMS on the way to the hospital, or once the patient enters the ED via a private car. An ECRN is a nurse that has a specific certification in emergency cases and can actually provide guidance to paramedics while they're on their way to the hospital. A Code Yellow is announced throughout the hospital and the trauma team assembles: trauma interns, trauma/surgical senior resident, trauma attending, social worker, and nurses.

The patient is either in the trauma bay or in an ED bed, depending on the current census of the ED.

While the patient is being stabilized by the clinical team, the social worker attempts to identify the patient and their family member(s) either by speaking with the patient, a cell phone, or any identification found on the patient. At the same time, a secretary calls Cure Violence to initiate any necessary response in the community.

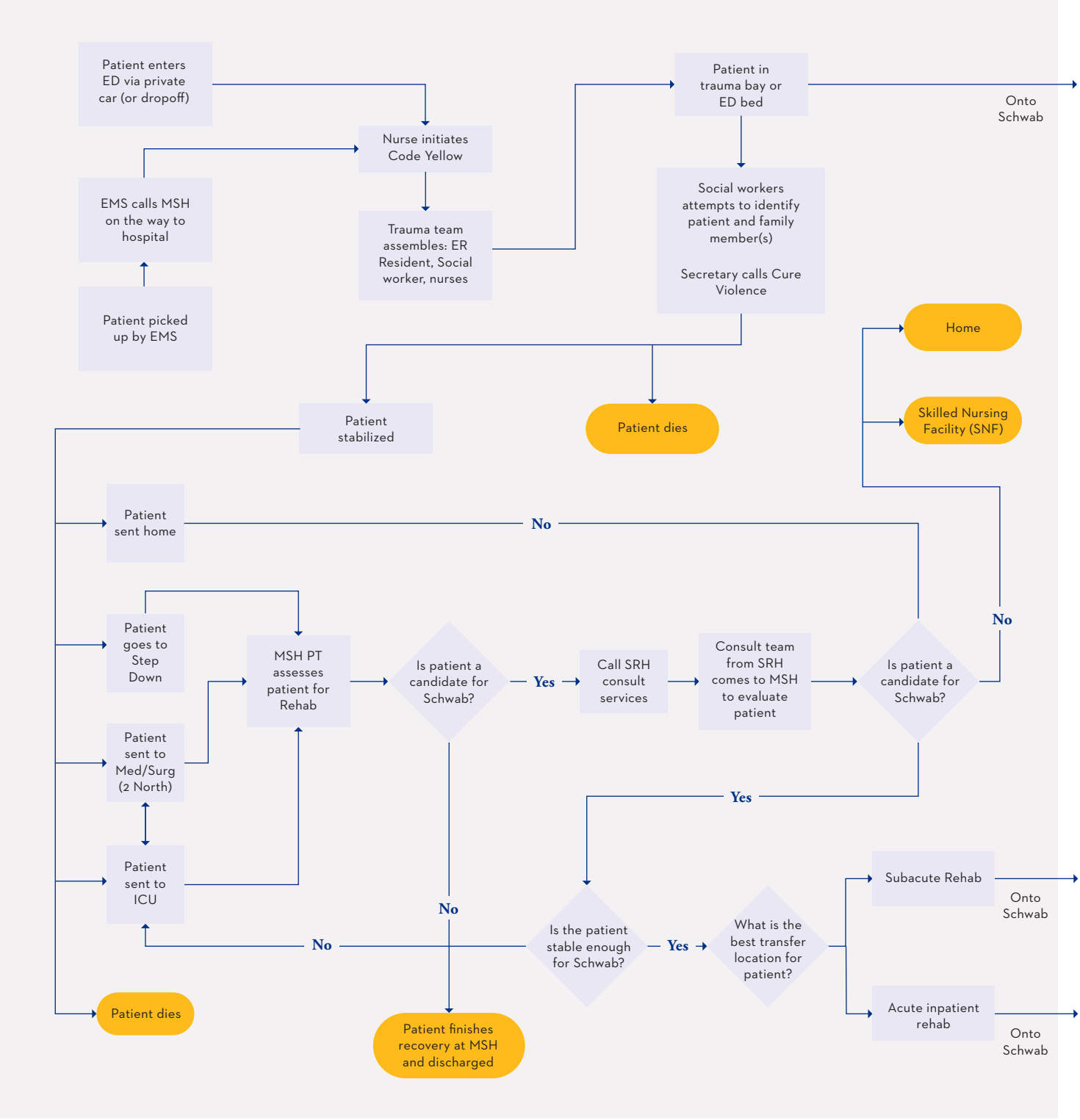
Mount Sinai Hospital ED Response

Any clinician who has engaged with the patient can make a decision that the patient would benefit from an evaluation from a physical therapist (PT). A PT's role is to make an assessment that a physician at Schwab should be consulted. Once an order is placed for a PT evaluation, a MSH PT finds a time to see the patient and make that evaluation. If the patient is deemed to be a suitable candidate for Schwab, an order is placed for a Schwab attending and resident physician to come to MSH to assess the patient. If the patient is not a good candidate for Schwab, they may either stay in the hospital until they are discharged home, or they may be discharged to a Skilled Nursing Facility (SNF). If a patient is an appropriate candidate for Schwab, they may either be ready to go immediately, or they may need further stabilization and medical management before they are transferred.

Once a patient is stabilized, the patient may be transferred to one of four places:

1. Home
2. Step Down Unit
3. Medical/Surgical floor, also known as *2 North*
4. Surgical Intensive Care Unit (SICU)

Mount Sinai Hospital ED Response



Non-fatal gun violence MSH response strengths

1 Code Yellow Protocol

MSH has a clearly delineated protocol for the initiation of a Code Yellow. Upon Code Yellow call, the trauma team prepares for the arrival of the patient which depends on the type of trauma that arrives. The team has distinct plans and roles to resuscitate the patient, stabilize them, and make a decision on the best next step for their recovery.

2. Clinical Care

Although gun violence in Chicago and in MSH's service area is higher than the national average, gun violence mortality is lower than the national average for Level 1 Trauma Centers. The clinical care and expertise at MSH is well above that of many hospitals in the country. Our staff of well trained and high quality nurses, residents, ER physicians, and trauma surgeons, has led to saving the lives of many patients. With average mortality at 8.5%[14] among gun violence patients, MSH's is at 1.8%.

3. Behavioral Health Services

Despite confusion around hospital-wide behavioral health services (more on this below), there are many ways to receive mental health services, including walk-in, in-patient, and out-patient clinics.

Non-fatal gun violence MSH response challenges

1. Superficially Wounded Patients

One missed opportunity for discussing and offering solutions to victims of non-fatal gun violence are among patients who are superficially injured. These patients enter the ED, do not meet the criteria for a Code Yellow activation, then assessed and patched up quickly. Within this time period, the patient is never admitted to the hospital and is in and out so quickly that he/she typically leaves without a social assessment. While it has proven to be challenging to identify and locate these patients in a timely matter, due to limited staffing, there is significant opportunity for future interventions.

2. Capacity

Given that trends in gun violence both nationally and within the MSH service area spike during the warmer months, there is an influx of patients that enter the ED for gunshot injury. During these times, on particularly busy days, staff report that there are certain times of the year when there are not enough beds to support the number of patients coming in with severe injuries. In these situations, the ED will typically utilize both the trauma bay and ED beds.

3. Lack of Efficient Behavioral Health Connection

There seemed to be some confusion around the referral process from the ED, in-patient units, and Schwab to Behavioral Health (BH) services. Despite SHS having a robust BH program at all of their hospitals, Sinai staff were convinced wait times were too long to be effective. Once probed further, it seems Sinai staff were trying to refer to psychology but instead were asking for psychiatry. The problem with this is that there is a 1-2 month wait to see a psychiatrist and, generally, that is not the referral Sinai staff intend to make. Sinai staff are usually looking for trauma-based therapy, which is handled by a psychologist, instead of medication management, which is handled by psychiatrists.

4. Safety of Patients and Staff

There is ongoing concern for the safety of both patients and hospital staff. MSH has taken precautions to ensure the safety of people in the hospital, but gun violence is often associated with retaliation, gang-affiliation, and ongoing violence. Staff reported that patients who are victims of gun violence have progressively gotten angrier and more defensive of their situation, and there is a need to ensure they are spoken to appropriately to provide the best clinical care as well as ensure a safe environment in the hospital.

Schwab Rehabilitation Response to Gun Violence

Overview

Schwab Rehabilitation (Schwab) is one of the three entities associated with Sinai Health System. Located directly across from MSH, Schwab is the only safety net rehabilitation facility in the country. Schwab does both inpatient and outpatient rehabilitation and provides specialty care for Traumatic Brain Injury (TBI), Spinal Cord Injuries (SCI), stroke and amputee patients, and other neurological conditions. For a patient to be admitted to a rehabilitation facility, the patient must have a need for medical supervision including rehabilitation-specific nursing staff 24/7, and be able to tolerate three hours per day of therapy. The patient needs to have the potential to achieve goals and make gains in their treatment. To better understand the process by which patients move through Schwab, interviews took place throughout 2018 with Physical Medicine and Rehabilitation Physicians, physical therapists, occupational therapists, psychologists, case managers, and nurses.

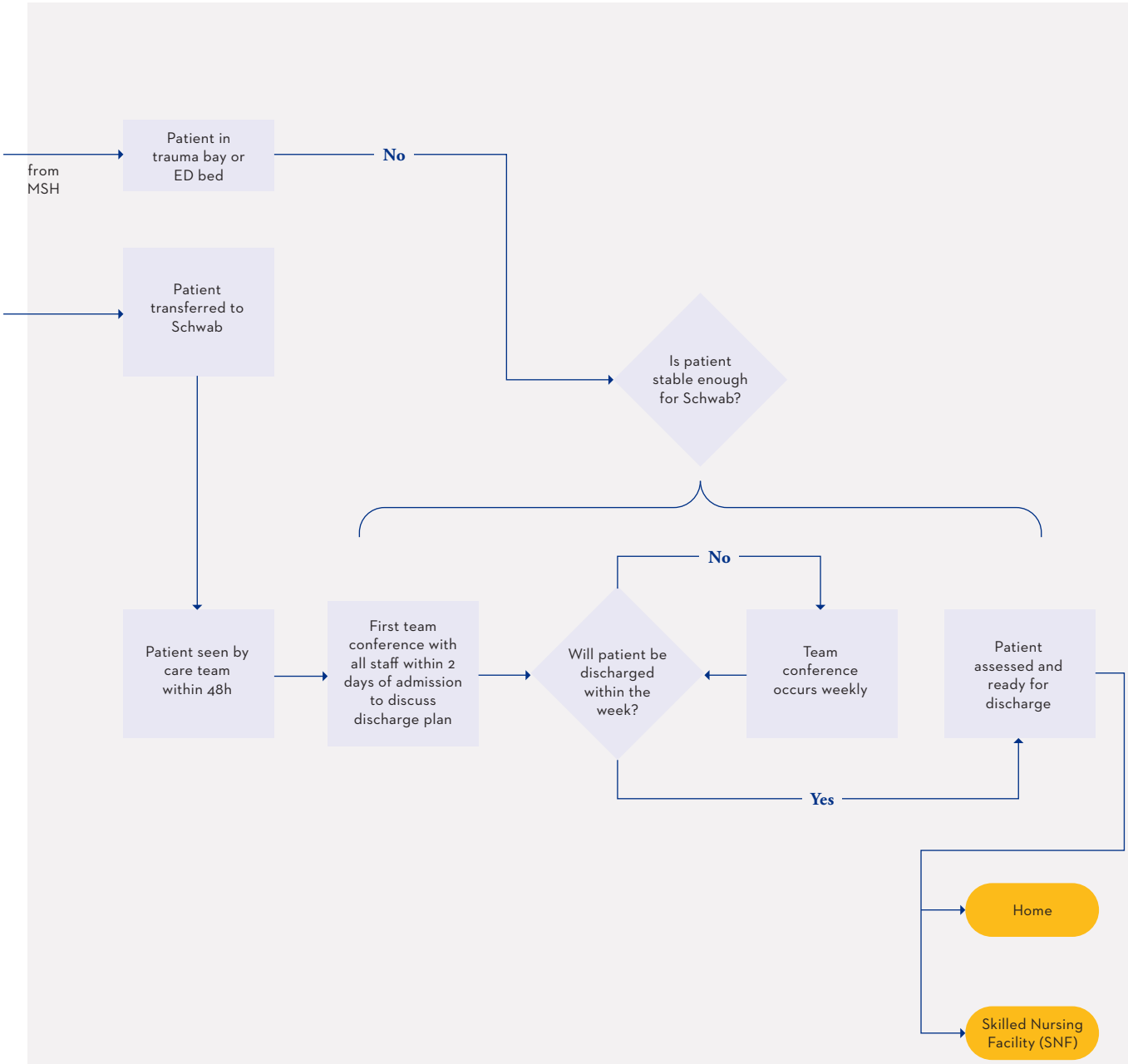
Trauma Response

Schwab staff become involved with a gun violence patient once the PT located at MSH evaluates the patient and identifies them as a possible Schwab candidate. A Schwab attending and resident come to MSH to evaluate the patient and make a further decision on the best course of treatment for the patient. The physicians may disagree with the PT's assessment and suggest the patient either be transferred to a SNF or be sent home. Conversely, the physicians may agree with the PT's assessment and identify this patient as a good rehabilitation candidate. Schwab will only take patients who are documented and have a caretaker who will be available to accept them once they are discharged from Schwab.

If the patient is a good candidate, stable, and meets criteria, the process for insurance verification begins. While the clinical team may make the best decision for the patient based on their progress, ultimately insurance makes the determination of whether the patient will be transferred to Schwab and how long they can stay. If insurance is approved, the patient will either be transferred to Subacute Rehabilitation or Acute Inpatient Rehabilitation.

Once the patient is successfully transferred to Schwab, the patient is seen by the following staff within 48 hours: Physical Therapy, Occupational Therapy, Speech Therapy (if necessary), a psychologist, the attending physician, a resident physician, and a case manager. This group of staff is considered "the team" and has a team conference within two days of the patient's admission to Schwab. The team discusses the patient's course of treatment and discharge plan. Team conferences will continue to occur weekly to discuss the patient's progress, including if the discharge plan will remain the same. At any point, the patient may be sent back to MSH via the ED if the patient experiences a medical issue that staff at Schwab are not equipped to handle. Once the patient is ready for discharge, they are either sent home or to a SNF.

Schwab Trauma Response (from MSH)



Non-fatal gun violence Schwab response strengths

1. Team Conferences

The protocol at Schwab ensures that each patient is seen by every member of their clinical care team within 48 hours of admission. Once that has occurred, the team meets to discuss the patient's injury, care trajectory, patient goals and discharge plan. The team makes a collective decision on what their expectation is for the patient's discharge, which is reassessed at each team conference. These team conferences occur weekly and ensure constant communication and planning by each member of the team. Opportunities to meet weekly ensure the patient is on track to meet their goals and be ready for discharge at the set date. These team conferences reaffirm the multi-disciplinary and collaborative approach to care that Schwab practices.

2. Resourcefulness

The majority of Schwab patients have Medicaid as their insurance and are oftentimes discharged with very few resources. In these situations, Schwab staff members have learned to be resourceful in ensuring patients are given the best resources and equipment when they are discharged. From interviews, staff indicated that for these patients, the hospital may have extra or old equipment that they can provide as charity depending on the patient need. For larger items, there are community resources they've partnered with, such as Devices for the Disabled, to provide for patients in need in the Chicago area.

3. Peer Mentor Program

Schwab has a Peer Mentor Program that pairs former Schwab patients who have had injuries resulting in a chronic disability with a current patient to provide peer-to-peer support. They are available for patients to discuss life living with this disability, their care during their stay at Schwab, and how they will transition back to their life at home. This is an optional program that current patients may participate in in order to discuss various medical, social, and cultural issues that may arise from their injury and subsequent handicap. Similar to physical and occupational therapists who teach patients how to strengthen muscles and practice day-to-day activities, peer mentors can reinforce these strategies. This program has enriched the progress of patients and continues to be an important and unique resource within Schwab.

Non-fatal gun violence Schwab response challenges

1. Schwab Nursing Staff

Interviews with various staff members at Schwab raised a few concerns about the nursing staff. The underlying causes of these concerns were the low percentage of Certified Rehabilitation Registered Nurses (CRRN) that are employed at Schwab. CRRN is a certification for nurses that provide them with the expertise in treating patients with disabilities due to illness or injury. Their goal is to support the clinical care of patients by teaching them how to cope with their disabilities and support the work of physical, occupational, and speech/language therapists. Only about 30% of Schwab nursing staff have the proper training to specifically care for these patients. Although this is in line with the national benchmark, there are concerns that the nursing staff are not properly trained and therefore not able to act in the best interest of the patient.

2. Durable Medical Equipment (DME)

Wheelchairs are one of the most common DMEs that victims of gun violence require in order to support their life once discharged from Schwab. To receive a wheelchair, the patient must be measured and assessed for the proper size and type of wheelchair. Once those data are collected, a wheelchair tech is able to get an appropriate wheelchair for that particular patient. At the same time, a case manager at Schwab must write a letter of medical necessity for the insurance company to approve this cost. Wheelchair delivery to a patient, whether at Schwab or at the patient's home, can take weeks or even months given the time for insurance approval and/or payment processing as well as actually building and delivering the wheelchair. Given the amount of time required, Schwab staff generally start this process as soon as possible. One significant barrier is that the therapists need time with the patient to see what they are capable of and what type of improvements they can expect for the patient.

Decisions about a wheelchair size and type are not just based on the initial assessment of the patient, but also their progress over the first week or two of their stay at Schwab. If this isn't considered, a patient may receive a device that is not adequate for their current health status. Other than wheelchairs, patients often require bathroom equipment, walkers, rollators, canes, and even mattresses.

3. Patient Expectations

An inherent challenge in rehabilitating SCI patients is the expectation for their recovery. Many patients struggle to cope with what their life will look like given the severe injury they've endured. This can result in anger, aggression, depression, lack of motivation, and isolation. Family support often helps with the progress of a patient, but not every patient has support of family or friends. Schwab providers described situations in which patients are solely focused on walking again regardless of whether this is in their plan of care at all. Staff never discourage patients from improvement, but they try to discuss their plan while keep expectations realistic.

4. FIM Score Consistency

A Functional Independence Measure (FIM) is an 18-item tool used to assess the physical, psychological and social functioning of a patient.[15] A patient's FIM score and their change in FIM scores can indicate the change in a patient's rehabilitation progress. Schwab staff measure a patient's FIM score at admission, day one, two, three, and at discharge. Interviews indicate that there is significant inconsistency in who is measuring the FIM score and how they are measuring it. As a result, there is misleading information about a patient's progress which can ultimately impact Schwab's aggregate reporting on patient care.

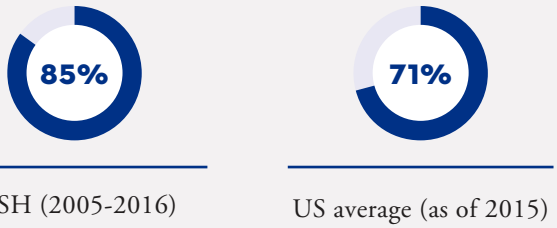
Discussion

The following section discusses the implications of the quantitative and qualitative data analysis in the form of secondary data analysis, interviews, and process mapping.

Gun Violence Trends

The trends seen from the quantitative data analysis illustrate the impact of non-fatal gun violence injuries in Chicago, at-large, and potentially in similar urban cities. The results provide a descriptive analysis of non-fatal gun violence patients presenting to the MSH ED during three unique time periods over the course of 12 years. Our findings suggest non-fatal gun violence due to assault is higher at MSH compared to national data, there are distinct patterns in non-fatal gun violence patients by age, gender, race/ethnicity, and where shootings occur, and that non-fatal gun violence injuries can result in significant loss of quality of life of young people due to resulting disability.

Non-Fatal Gun Violence As a Result of Assault



14 points higher than national average

Over the course of the 12-year study period, assault was the primary cause of injury (85% of all cases), as well as the primary cause of injury during each unique time period. A 2015 analysis of national gun injuries and death data found that 72% of non-fatal gun violence injuries were due to assault, lower than what was found at MSH. The high proportion of these injuries being due to assault mean there is an increased risk of retaliation as well as a higher risk of a subsequent trauma, also known as injury recidivism.[16] A 2017 study of over 10,000 admissions in an urban level 1 trauma center found that of patients with a violent trauma (blunt assault, stabbing, or gunshot wound), patients admitted for a gun violence injury had a 13.5 times higher odds of mortality compared to blunt assault.[17] Compared to blunt assault and stabbings, patients who experienced a gun violence injury were the only violent injury in which severity of the injury increased with each additional hospital admission.[18]

While gun violence is prevalent in communities such as those on the South and Southwest sides of Chicago, research suggests that gun violence and victims of gun violence are actually quite concentrated within specific populations.[19] A 2012 study of the relationship between gun violence victims and characteristics of their social network found that associating with gang members and knowing others who have been victims of gun violence significantly increase one's own chance of becoming victims themselves. Dense high risk social networks are comprised of a small percentage of the community population, but are involved in a majority of community gun violence.[20]

Demographics

Throughout each time period, over 50% of non-fatal gun violence injuries occurred among people ages 16-24, and over a quarter of injuries occurred among those aged 25-34. This study also found that significantly more males were affected by non-fatal gun violence. Historically, males have been the dominant group affected by non-fatal gun violence, as our results support.[21] However our analysis also found that females experienced a 72.6% increase in non-fatal gun violence from 2005-2008 to 2013-2016. One of the suspected reasons why there has been a shift in gender for non-fatal gun violence is due to changes and usage of social media. "Internet banging" and seeing threats and language from gang affiliated individuals online are leading to increased crime and retaliation, which is different from how assault used to manifest – which was primarily in the streets.[22]

Non-Fatal Gun Violence by Age

of non-fatal gun violence injuries occurred among people ages 16-24

of non-fatal gun violence injuries occurred among people ages 25-34

Between the years 2005-2015, there was a decline of over 100,000 people in the Black population throughout Chicago compared to minor growths within the White, Hispanic, and Asian populations.[23] This can be partly attributed to the decrease in the overall Chicago population and increase exposure to high risk social networks. The city of Chicago has experienced a 6.9% decrease in population between the years 2000 and 2010. During the same time period, communities on the West and South/Southwest sides have experienced the majority of these decreases. The Englewood community of the Southwest side experienced a 23.8% decrease in population and the West Garfield Park community of the West side experienced a 21.8% decrease in population.

Gun Violence Locations

While citywide, the rates of violence between the Westside and the Southside of Chicago are similar, there are differences in cases presenting to MSH. This is likely due to the location of MSH and its primary service areas. Although MSH's primary service area stretches into the Southwest side of Chicago, its central location in the Westside of Chicago lends itself to serving more patients from that area.

This MSH hospital data analysis found an increase in injuries on Chicago's Westside from 512 injuries in 2005-2008 to 894 in 2013-2016. While this increase is quite high, we also see a pretty large decrease in injuries during this time period within those categorized as unknown Chicago Metropolitan area (from 471 injuries to 106 injuries). Although violence on the Westside has increased since 2005, it is just as likely that MSH improved their ability to collect accurate information during patient intake.

Our analysis of 12 years' worth of non-fatal gun violence data from MSH suggests that the most effective public health programming should address Black males between the ages of 16-24. Entry into the ED and further admission to the hospital for non-fatal gun violence injuries presents an opportunity for intervention during a time when the patient might be most susceptible. Many hospitals do not have protocols or strategies in place to interrupt the cycle of violence, and patients injured by guns are typically discharged without any screening or intervention taking place. Introducing Hospital-based Violence Intervention Programs (HVIP) can lower injury recidivism, increase medical care payments, and increase overall cost effectiveness.[24,25] HVIP focuses on reaching high-risk individuals who have been recently admitted to a hospital for treatment of violent injury. Hospitalizations present a "teachable moment" when someone may be open to positive intervention. More on this below, in the Recommendations section.

Challenges

We attempted 4 patient interviews over the course of one month. The patient population proved to be inaccessible, and it became a mostly unsuccessful endeavor. One patient, for example, turned out to be ineligible due to his pathway to Schwab. He was initially taken to a nearby ED, then to one of their inpatient units, where he was treated until transferred to Schwab. We continued to ask him questions about his experience at Schwab, but we weren't able to get information on the bigger picture of how gun violence patients move through MSH. Another patient was so traumatized from the experience of being shot and cared for, that they declined to be interviewed. Schwab's census of gunshot wound victims was low during the time of our interviews. Additionally, it was rare that a patient affected by gun violence had been in the Sinai ED before making their way to Schwab. The patients who were eligible were very severely injured, and we believe that we would have received better insight had cases been less severe. For example, the patient who did spend time in Sinai's ED and inpatient unit was heavily medicated during that time period and therefore couldn't recall specific details about his experience.

Another limitation of interviewing patients was asking them questions about Sinai and Schwab while they were still at Schwab. While we explained to them that we work for a separate entity and answering wouldn't affect their quality of care, we believe patients were hesitant to voice negative opinions while still at Sinai. One patient we interviewed occupied a room directly across from the nurse's station. He only had positive things to say about his experience, but he may have given us different answers, or at least offered up more information, had we interviewed him in a more neutral area. We also interviewed these patients shortly after they arrived at Schwab, so they were unsure about discharge processes and resources they might be linked to outside of Sinai.

Recommendations

The following section will provide concrete recommendations to Sinai Health System and other urban Level 1 Trauma centers that are similarly plagued with gun violence.

Non-Fatal Gunshot Violence Data

While having a state-wide central database for gun violence is important for assessing the incidence of gun violence in Illinois, it would be beneficial to have a shareable hospital wide mandatory reporting system in addition to the standard capture of patient hospitalization data. As discussed previously, the data we analyzed was limited to gun violence victims who were at the hospital for at least twelve hours. Many patients are in the hospital for far less than twelve hours due to superficial injuries, leading us to believe that we are underestimating the total impact of gun violence at Mount Sinai Hospital and in our primary service area at large. When a patient is in the hospital for more than twelve hours, generally, they have the opportunity to interact with a case manager or social workers that is then able to assess any physical, social, or clinical needs, patients who are not transferred to an in-patient unit are not given a case manager.

> “ ... it would be beneficial to have a shareable hospital wide mandatory reporting system in addition to the standard capture of patient hospitalization data.

Intervention Opportunities

As stated throughout this report, one of the most important gaps in non-fatal gun violence prevention is the need to intervene on these patients before they are discharged into the same communities that landed them in the hospital. There are several ways to do this, however at its most basic level, a staff member needs to be available around the clock daily to anticipate anyone coming in for a superficial non-fatal gun violence injury. We believe this could also be pertinent to other types of injury, unrelated to gun violence injuries, such as stabbings and domestic violence based injury.

Hospital-based Intervention Programs (HVIPs) have been shown to be effective in saving lives and reducing costs for hospitals. Based on the work of Purtle et al. (2013), HVIPs combine brief in-hospital intervention with intensive community-based case management and provide targeted services to high-risk populations to reduce risk factors for re-injury and retaliation while cultivating protective factors.[26]

In the case of MSH, our research has shown that a social worker or community health worker (CHW) would be a viable option for implementing a secondary prevention intervention for non-fatal gun violence victims. A social worker or CHW is intrinsically linked to the community in ways that standard clinicians may not be. They also have more time to address social issues with patients. There has been some preliminary research conducted on the practicality and efficacy of implementing screening tools for firearm violence victims with some success. In 2018, the University of Michigan created a screening tool to identify high risk patients (with a focus on youth, since younger men are the majoty of victims and perpetrators of gun violence).

The researchers found that risk of future gun violence could be categorized into 4 primary domains:

1. Violence Victimization

Violence items from the National Longitudinal Study on Adolescent Health captured the frequency of received threats/violence, perpetrated threats, fighting, and carrying a weapon while intoxicated in the past 6 months.[27]

2. Community Exposure

Community violence exposure included assessment of the frequency of exposure to violence and neighborhood crime in the past 6 months.[28]

3. Peer Influences

Peer influences included items from the Flint Adolescent Study regarding the number of friends providing positive and negative influences; positive items were reverse coded.[29]

4. Fighting

Fight self-efficacy assessed perceived ability to avoid conflicts.[30]

Social workers and CHWs are uniquely positioned to implement a validated screener, which as research has shown, can help predict who is likely to recidivate, which many times leads to permanent disability and death. Intervening as early as possible is vital. Lastly, once a need is identified, there should be a clear linkage to community supports – both SHS programs and affiliated community based programs – for patients to easily access.

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Sinai Urban Health Institute

Sinai Urban Health Institute (SUHI), a leading public health research institute in Chicago, works in partnership with community members and organizations to document disparities and improve health in some of the most vulnerable neighborhoods in the city. SUHI conducts health disparities research, develops innovative community health interventions, delivers community health worker training and consultation, and provides a broad scope of evaluation services.

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