STATE OF MICHIGAN TRAUMA SYSTEM ANNUAL REPORT 2021

Division of EMS & Trauma

Bureau of EMS, Trauma and Preparedness

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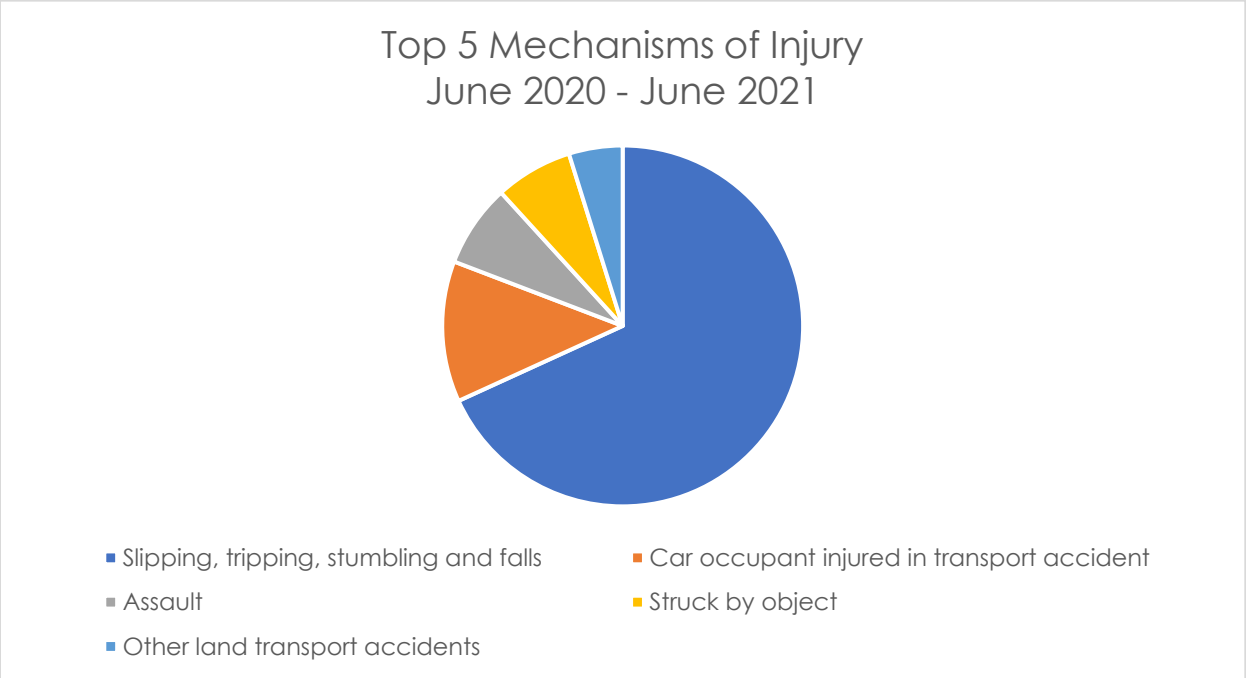
Introduction

The statewide trauma system is charged with providing seamless care for the injured through a regionalized, coordinated, and accountable system. The system, structure, partners, and stakeholders met this charge in 2021 while at the same time addressing the challenges presented by the COVID-19 pandemic (first Michigan case identified March 20, 2020). The trauma system cared for the injured in Michigan, monitored care delivery, tracked outcomes, and engaged in system evaluation.

Data

Data continues to drive trauma system decision making, identify issues, inform performance improvement, and effecting change. There are currently 488,215 incidents in the state trauma registry. The chart below illustrates the top five mechanisms of injury that occurred in Michigan over the past year. Falls remain in the top five mechanisms of injury. Both the regions and individual trauma facilities identify and track these data which allows for program resource planning and focused injury prevention initiatives to address this and other targeted issues. Many, if not most, injury prevention initiatives in 2021 have been limited in scope or virtual in nature due to the pandemic.

Figure 1



Source: Michigan Trauma Registry

Motor Vehicle Accidents

MICHIGAN STATE POLICE CRIMINAL JUSTICE INFORMATION CENTER CRASH STATISTICS MONTHLY PROGRESS REPORT 2019/2020/2021 CRASH DATA COMPARISON

Figure 2
Fatal crashes

2019	697
2020	775
2021	884

Crash Injuries

2019	44,595
2020	36,893
2021	42,394

Total CRASH (fatal, injury, property damage, traffic crashes, non- traffic)

2019	255,233
2020	203,849
2021	229,306

Source: Michigan State Police Criminal Justice Information Center Crash Statistics

Motor vehicle accidents have been one of the top three mechanism of injury in the trauma registry in 2019, 2020, and 2021. It has been postulated that the number of motor vehicle accidents decreased in 2020 related to the Governor's Executive Order 2020-21 that limited gatherings and travel and required workers who are not necessary to sustain or protect life to stay home. The National Highway Traffic Safety Administration reported that an estimated 20,160 people died in motor vehicle crashes in the first half of 2021, up 18% over 2020, and the largest number of projected fatalities in that time period since 2016.[1]

1 1https://www.nhtsa.gov/press-releases/usdot-releases-new-data-showing-road-fatalities-spiked-first-half-2021 accessed11/8/21

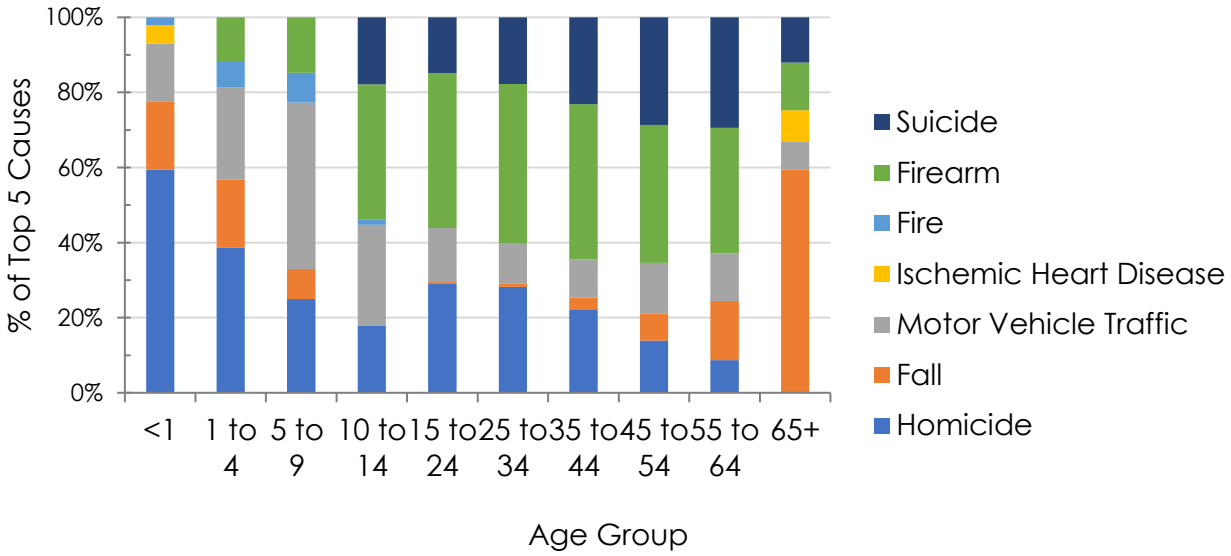


Figure 3 describes the top 5 causes of injury fatalities by age group. Falls are prevalent in the 0-4 age groups and the 55 and older age groups. For Michigan children less than 5 years, homicide is the leading cause of death related to injury fatalities.

Source MDHHS Trauma IP Figures. 2021

Figure 4
Penetrating injuries:

	Region 1	Region 2N	Region 2S	Region 3	Region 5	Region 6	Region 7	Region 8
2019	232	360	1,477	508	235	326	129	42
2020	276	420	1,516	691	326	480	175	48
2021*	22	84	390	25	54	202	5	20

*Represents one quarter of annual data Source: Michigan Trauma Registry

Specific regional data such as that described above (Figures 3 and 4), have provided information about issues that are regional or refined by geography, resources, and population density. Regions are tracking data such as penetrating trauma to refine prevention strategies, and target resources and education in efforts to improve outcomes.

Regions

Regional Trauma Networks have continued work on network workplans and initiatives, meeting virtually, discussing challenges and best practices, planning injury prevention activities, supporting the pandemic response, and when requested, mentoring facilities that are preparing for state verification visits. These efforts were reported to the State Trauma Advisory Committee (STAC) quarterly and available here.

Verification and Designation

The Trauma Section, in collaboration with partners and subject matter experts, designed and developed a virtual verification process in 2021 for state trauma program verifications. The process was evaluated with 5 pilot programs and proved to be a successful method of verifying the resources of programs. Information on the process and requirements for participation can be found here.

The STAC voted at the October meeting to support the use of a virtual verification process. There are 62 pending site visits resulting from a pandemic required suspension of site reviews in 2020. Site reviews have been rescheduled beginning with facilities that have outdated verifications and moving through facilities that have not yet been verified. It is expected to take two years (through 2023) to complete the backlog of visits. Using the more expedient virtual process (less reviewer travel time and more time available to prep and review materials) makes it an important option to ensure timely and effective verification of trauma resources. The American College of Surgeons has employed a virtual verification process to verify the resources of Level I and Level II and some Level III facilities for the past year and that is expected to continue. Several Michigan facilities (11 in 2021) have been reviewed virtually by the ACS.

Projects

Biospatial Collaboration

The EMS and Trauma Division are responsible for two disparate data collection tools that describe the care provided to injured/emergent conditions of Michigan residents. Michigan Emergency Medical Services Information System (MI-EMSIS) is the repository for the prehospital patient care record. It has been a requirement in Michigan since 2009 that the record be sent in an electronic format to the repository. For the past 12 years the EMS Division has been working to advance timely routine data submission, assessment of data quality, and data reporting. That work is ongoing.

The state trauma registry is the repository for information on the care of the injured in Michigan that fit National Trauma Data Set (NTDS) inclusion criteria. Michigan's trauma system requires that trauma facilities collect national trauma data elements and definitions as a minimum data set.
The data for both repositories is managed by ImageTrend® through a contract overseen by the Department of Technology, Management, and Budget (DTMB). ImageTrend® is one of two trauma data software systems (ESO is the other) in the

country. Data extraction and report writing using the current platform remains cumbersome, and end users have had challenges extracting user-friendly reports from the software programs.

Biospatial has been engaged in developing user-friendly displays of EMS data initially for the federal government as part of data gathering for preparedness. The company has expanded that role to offer similar services directly to states to assist in just-in-time data displays of EMS data, writing programming to allow for dashboard displays of data, etc. Biospatial has been engaged in work with the Division to display a variety of EMS data elements including writing a dashboard to display the (required) CDC Field Triage criteria which determines the most appropriate trauma facility based on the injury. Biospatial approached Michigan with a proposal to display trauma data. The project will use Biospatial software to display EMS and trauma data and to probabilistically link patient care records in both the MI-EMSIS and trauma data collection repositories. The vision is that the user-friendly graphics will assist in informing partners and stakeholders about the effectiveness of the system and the care provided across the continuum of care from prehospital to discharge.

System Support Grants

2021 Michigan Trauma System Project Announcement

BETP

The Bureau of EMS, Trauma & Preparedness (BETP), Trauma Section, is committed to supporting partners and stakeholders in the trauma system to enhance their efforts in system building and maintenance. BETP has approved funding amounts of $8,000 for trauma system stakeholders to support projects and initiatives. These monies will be used to fund projects in the following categories: **Injury Prevention, Trauma Education, Performance Improvement, and Trauma Infrastructure**. The projects may begin in April with receipt of award email and must be completed by September 30, 2021. Project funds may not be used for COVID-19 response. The Regional Medical Control Authority Networks will be the program fiduciaries responsible for program monitoring and fund disbursement. To get started see the Trauma Section website, www.michigan.gov/traumasystem, for participation and project paperwork.

A total of 213 grants were awarded to partners and stakeholders representing $1,686,042 to continue to develop and maintain the trauma system. This support was pivotal in maintaining resources for the system already taxed by the pandemic. A report on the work the stakeholders were engaged in will be published in early 2022.

2021 MCA/Trauma Conference

The Division of EMS & Trauma supported the Medical Control Authority and Trauma Conference. The 2021 conference was held virtually, allowing for healthcare providers to learn about cutting edge practices, and meet virtually while limiting the impact to their frontline work. There were 177 conference attendees. Registrants can view the recorded sessions until November 30, 2021, to obtain continuing education credits.

Injury Prevention Plan

The Michigan Trauma System Injury Prevention Plan is in development. The plan describes injury and injury trends in Michigan using multiple data sources. It reiterates the strategies outlined in the Michigan Trauma System Strategic Plan 2018-2023, Regional Trauma Network workplans, the Michigan Criteria that address injury surveillance, and the implementation of interventions to address identified issues. Anticipated publication date is January 2022.

Ongoing projects

Work is continuing on several projects initiated earlier including: the bypass/diversion project that has been a focus of stakeholders in Region 6, the double transfer monitoring project in Region 2S, and the facilitated transfer project in Region 3. Each were mentioned in the 2020 Annual Report. These projects continue to inform system efficiencies and gaps made wider by the pandemic response.

System Evaluation

The STAC, Regional Trauma Advisory Committees, and Regional Professional Standards Review Organizations met throughout the year (virtually) to review data, discuss issues, report on projects and initiatives, and vote on policy and procedures as needed. The Regional Trauma Network Boards did not consistently meet as there were limited issues that required Board action.

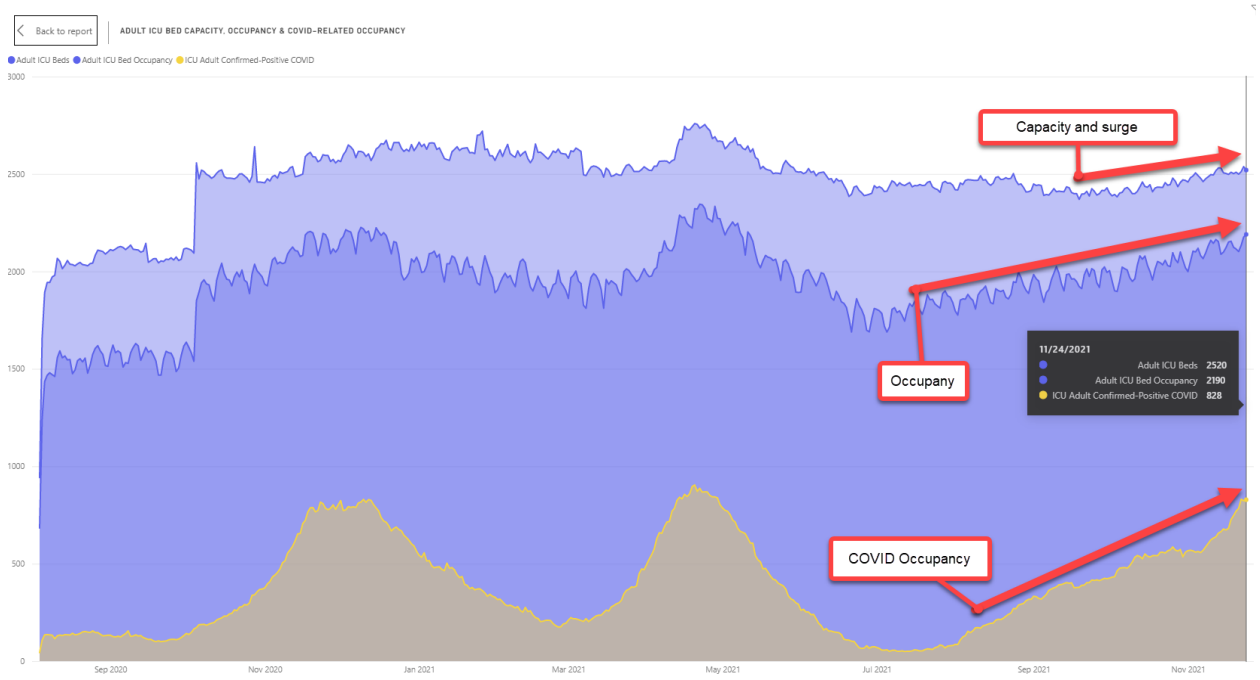
The Michigan Trauma System Strategic Plan initiatives were reported to the STAC quarterly. Preliminary work has begun on a rehabilitation environmental scan to describe and define rehab assets in Michigan.

The Trauma Section Staff have supported the COVID-19 response and have worked with the Preparedness Section on a variety of efforts including the revision of ethical guidelines, interfacility transfer plans, agreements for pediatric and burn patients, Pediatric Champion Office Hours, EMSC Performance Measures, collaboration with pediatric healthcare leaders in the state, burn surge plans, MI-TESA, monitoring EMResource to inform and assist trauma regarding the use and availability of resources in their region, Healthcare Coalition initiatives, and regional ad hoc committee meetings to discuss trauma response in Regions 2S and 2N.

The Risk Adjusted Benchmarking (RAB) project for Level III Trauma Facilities is ongoing. Dr. Mark Hemmila presented at the STAC in June. An additional ongoing project is the voluntary audit project Level III facilities are working on with the MTQIP team to monitor data completeness and accuracy. Of the 26 Level III facilities engaged in RAB, nine will participate in the audit project this year (two have volunteered for the audit annually since 2019). Validation error rates so far range from 2.2% to 3.5%.

Data hygiene practices are ongoing including monitoring user access and permissions, ensuring EMS NTDS data elements are included in the registry after STAC supported the return of these elements from the previous 2019 NTDS, monitoring IDTX file transfers and troubleshooting data input, identifying data discrepancies and null values including those in MIEMISIS as it relates to patient disposition.

Figure 5



Source: EMResource accessed 11/9/21

System evaluation must include monitoring system capacity particularly during the ongoing pandemic. Figure 5 shows data on bed availability, this metric, along with considerations about available staff to care for patients in these beds describes an aspect of system capacity. Capacity is a critically important metric necessary to understand system function and effectiveness. Bed capacity is only one a many system metrics monitored. Trauma system evaluation is ongoing and continuous at every level from provider, facility, region, and the state.

The trauma system in Michigan continues to mature, working to continually improve care for the injured and to capitalize on the efficiencies the system has realized. Those include improved communication, stronger partnerships, data driven change, mentoring and program building between Level I and Level II trauma facilities and the smaller facilities throughout the state, follow up and learning about care delivery to improve patient outcomes. This work is crucial particularly now when resources are strained, and capacity is exceeded. Throughout the past year this, regionalized, coordinated, and accountable system of care for the injured continued to ensure the right patient gets to the right resource at the right time and will continue that charge well into the future