STATE OF MICHIGAN TRAUMA SYSTEM ANNUAL REPORT 2020

Division of EMS & Trauma

Bureau of EMS, Trauma and Preparedness

Michigan Department of Health & Human Services

1001 Terminal Road
P.O Box 30207
Lansing, Michigan 48909-0207
Phone: 517-241-3025
Fax: 517-335-9434

Trauma Website:
www.michigan.gov/traumasystem

Table of Contents

Introduction **3**

STATEWIDE TRAUMA ADVISORY SUBCOMMITTEE **4**

Designation Committee 4

REGIONAL TRAUMA SYSTEM **5**

VERIFICATION AND DESIGNATION **7**

Verification 7

Designation 8

Data **9**

System Evaluation **14**

Projects and Initiatives **15**

2019 Trauma Conference 16

MTQIP 16

Stop the Bleed 18

COVID-19 18

Introduction

The trauma system in Michigan was operationalized in 2012 when the Michigan legislature appropriated funding to implement the 2009 Administrative Rules titled *Michigan Department of Health and Human Services, Bureau of EMS, Trauma and Preparedness, EMS and Trauma Section Statewide Trauma System.* The Administrative Rules were revised in 2017 to reflect necessary clarifications identified during operationalization. The statewide trauma system is charged with providing seamless care for the injured through a regionalized, coordinated, and accountable system.

Over the past eight years, the required trauma system infrastructure has been put in place including:

- **The Statewide Trauma System Coordination Subcommittee (STAC):** Public Act 580 2004 Sec. 20917(a) describes the committee membership, quorum and responsibilities… "to advise and assist the department on all matters concerning the development, implementation, and promulgation of rules for the implementation and continuing operation of a statewide trauma care system."[1]
- **The Designation Subcommittee:** This is a subcommittee of STAC and was put into place in 2016 to advise the department regarding the specifics around the process of verifying trauma resources in acute care facilities.
- **Eight Regional Trauma Networks (RTN)**: These networks have been recognized and charged by the department to undertake the development and oversight of the trauma system in each of the geographic areas described as the emergency preparedness regions. This includes regional performance improvement initiatives and regional injury prevention activities based on local injury patterns.
- **Verification and Designation**: There are 105 verified and designated trauma facilities in Michigan currently. Designating hospitals whose resources have been verified as trauma facilities ensures that the right patient gets to the right resources at the right time.
- **The Statewide Trauma Registry:** Data submission is a requirement for designation. Registry data is used to monitor system performance, track and trend mechanism of injury and injury severity to inform injury prevention initiatives, and monitor patient outcomes (including deaths), and improve care.
- **Local Injury Prevention Initiatives:** These initiatives are aimed at preventing or ameliorating the impacts of the top mechanisms of injury.
- **System Evaluation**: This occurs on both regional and statewide levels to monitor and improve system impacts and effectiveness. The Trauma Section supports and monitors regional work, reports those efforts to STAC quarterly, staffs the Regional Professional Standards Review Organizations (RPSRO) and is responsible for collating data for the RPRSO Inventory and the Regional Performance Improvement template and process. Trauma system development work and work products undergo continuous Plan-Do-Study-Act (PDSA) performance improvement cycles where improvement and modifications are made that address inputs from stakeholders, efficiencies, new data, and science.

[1] Michigan Public Act 580 2004 www.legislature.mi.gov/documents/2003-2004/publicact/pdf/2004-PA-0580.pdf

STATEWIDE TRAUMA ADVISORY SUBCOMMITTEE

System implementation is supported by The State Trauma Advisory Subcommittee (STAC) and its subcommittee the Designation Subcommittee. These committees were established under the Emergency Medical Services Coordination Committee (EMSCC) to advise and assist the department on all matters concerning the development, implementation, and promulgation of rules for the implementation and continuing operation of the Statewide Trauma Care System.

The composition of the STAC is outlined in statute. There are ten members on the committee representing the gamut of professionals involved in the care of the injured. STAC meets bi-monthly. Meetings are subject to the Michigan Open Meetings Act 1976, PA 267, MCL 15.261 to 15.275.

In 2019, the STAC reviewed and provided input regarding the revisions to the Regional Trauma Network (RTN) application. In 2020, the STAC reviewed the applications submitted by each regional RTN Board and advised the Department on recommendations for approval. The STAC also commented and suggested edits to the Regional Professional Standards Review Organization Inventory as it was developed and the performance improvement toolkit. The STAC was consulted on verification criteria and the plan to extend the verification/designation periods to match the American College of Surgeons policy in response to the COVID-19 pandemic. In 2019, the STAC and the EMS Quality Assurance Task Force met collaboratively to discuss the prehospital use of Ketamine. The STAC continues to support the development of the state trauma system strategic plan, advises the department on national issues and on cutting edge initiatives and projects from partner organizations such as the American College of Surgeons and Stop the Bleed.

Designation Committee

The Designation Committee is composed of trauma medical directors and trauma program managers from American College of Surgeons (ACS) Level I and Level II trauma facilities. These trauma experts have a deep understanding of the verification process and requirements. All facility requests for Designation are reviewed by the Designation Committee. They review the materials from state conducted verification visits and advise the Department regarding hospitals seeking Level III and Level IV verification and designation. Level I and Level II trauma facilities in Michigan have their resources verified by the American College of Surgeons and then submit applications requesting designation as a trauma facility. Level III facilities may have their resources verified by the ACS or the state. Verification and subsequent designation as a trauma facility are in effect for three years.

The Designation Committee meets bimonthly. In 2020 the committee reviewed 12 applications from American College of Surgeons verified trauma facilities requesting to be designated by the Department. The Committee recommended that all those applications be approved. There were nine site visit reports from potential Level III and Level IV trauma facilities submitted by the site reviewer lead author. Each report is reviewed by two Designation Committee editors who then report their findings to the Committee. The Committee votes on whether the facility should be designated, not designated, or receive a focused visit in one year to determine if identified issues have been addressed. The Committee recommended that eight of the applications reviewed be designated. Of the applications for verification submitted, three had focused visits scheduled. A Designation Committee member and one site visit reviewer conduct focused visits. The Committee reviewed two focused visits reports and recommended that both of those facilities receive a 2-year extension to their 1-year verification and designation.

REGIONAL TRAUMA SYSTEM

There are eight regional trauma networks responsible for system development in their geographic area (Figure 1). Administrative Rule 325.132 Rule 8 (2) states, “Each region shall establish a regional trauma network as prescribed and defined by R325.125 to R 325.135.”[2] Triennially the regions submit applications requesting recognition by the Michigan Department of Health and Human Services as a regional trauma network. Each region is organized to include:

- A regional trauma network board responsible for the trauma system in the region.
- A regional trauma advisory council composed of trauma content experts as well as a consumer.
- A regional professional standards review organization (RPSRO) responsible for monitoring, assessing, and evaluating regional trauma data to improve care, reduce death and disability, provide surveillance of injury, and implementation of injury prevention activities.

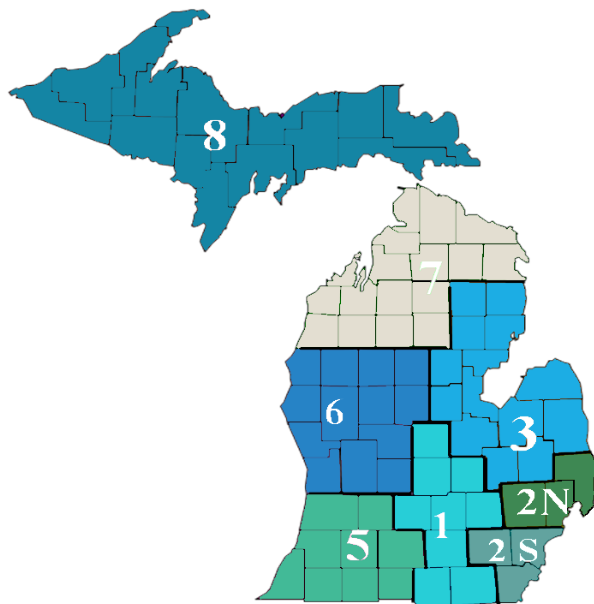


Figure 1

2. Statewide Trauma System Michigan Administrative Rules https://www.michigan.gov/documents/mdhhs/2016-062_HS__Final_Non-Strike-Bold_State_Wide_Trauma_System_572427_7.pdf

Each region submits reports on system activities to the STAC and the Department quarterly, with the 4th quarter report serving as an annual update of the system. Reports are posted on the state trauma system website under each region: https://www.michigan.gov/mdhhs/0,5885,7-339-71551_69345_69350---,00.html.
Regional performance improvement is driven by the RPSRO Inventory of system metrics and Administrative Rule driven performance measures. These measures are collected twice a year and reported to the RPRSO (May and December) for review and tracking. Intra-regional issues are reported to the RPRSO chairs for consideration and follow-up.

Considering the unique resources, issues, and challenges, each region manages and monitors the trauma system in their respective geography. Regional leadership, supported by the regional trauma coordinator (RTC) from the State Trauma Section, determines priorities and projects that address system needs. While the pandemic response impacted all regions starting in early March, there were a variety of initiatives begun in 2019 that assisted in supporting the Trauma System in a myriad of ways.

- **Region 1:** During the COVID-19 response the Regional Trauma Coordinator forwarded to trauma and EMS partners the most up to date information on the virus, EMS protocols, patient management, state and regional activities, information on telehealth and CMS information regarding its use. The RTC continues to work closely with the regional Health Care Coalition. Primarily the needs revolved around data collection and monitoring.
- **Region 2 South:** Developed a tracking process to monitor multiple transfers in the region by reviewing each to determine if the transfer was necessary and effective. The project indicates that while the working supposition was there were a significant number of multiple transfers occurring, that did not appear to be the case, and the transfers that did take place were appropriate. The region is also tracking the use of tourniquets to monitor proper usage and the impacts of the Stop the Bleed training throughout the region.
- **Region 2 North and Region 2 South:** Participated in a regional ad hoc COVID-19 trauma steering committee established by Region 2 South in March to share experiences, best practices, and updates about the care of patients with COVID-19.
- **Region 3:** The region identified the need to develop some uniformity in the patient transfer process and developed a “transfer envelope” and checklist to facilitate the collection and transfer of patient information. The envelopes were delivered to each facility in the region in November.
- **Region 5:** Has a group working on standardizing critical care transport specifics. They are looking at what is a critical care transport, how should the staff be trained, and what equipment should be on the rigs.
- **Region 6:** Three hospitals in Region 6 reported (in EMResource) a high number of hospital diversions for the reason “no ortho” which indicates the hospital does not have orthopedic surgeon coverage during the time specified. The emergency department (ED) is open however, and ambulances may be diverted after triage by the ED physician providing medical control. A study was conducted resulting in three potential opportunities identified. An opportunity is a

patient that was diverted to another county and/or higher level of care when the hospital is on "no ortho" status AND the patient is discharged from the ED. There will be additional research into the 3 cases based on feedback from the RPSRO. The study served to reinforce adherence to protocols, for example, EMS calling medical control before diverting. The study also served to inform the hospital's leadership on the number and types of patients transported out of the county for care.

- ❖ **Region 7:** The region has two hospitals in the que for verification and one that was due for an ACS visit in spring of 2020. Those that have already been designated are focused on maintaining the momentum created by their designation preparations and with assisting those not yet designated in preparing for their visits. Verification visits have been delayed one year due to impacts from the pandemic.
- ❖ **Region 8:** In 2019 in addition to an injury prevention program database for the region, a rehabilitation survey was distributed. The survey collected information on who uses what types of programs and where they are. This completes a regional workplan objective. The Stop the Bleed program may be expanding to more of the roadway professions by working with other types of Region 8 partners, such as those participating on the UP-Traffic Safety Committee. The Ride Right Campaign for snowmobiling has expanded with multiple partners from the DNR to law enforcement agencies, snowmobile associations, etc.

VERIFICATION AND DESIGNATION

Verification

Acute care facilities in Michigan that intend to become designated trauma facilities must have their resources verified by either the State of Michigan or the American College of Surgeons Committee on Trauma (ACS-COT) as either a Level I, Level II, Level III, or Level IV trauma facility. The ACS verifies Level I, Level II or Level III trauma facilities. Michigan has the authority to verify Level III or Level IV trauma facilities. These facilities must demonstrate the ability to care for injured and severely injured patients. Level I trauma centers "must have the capability of providing leadership and total care for every aspect of injury, from prevention through rehabilitation." Level II trauma centers are also…" expected to provide initial definitive trauma care, regardless of severity of injury." Level III trauma centers… "can provide prompt assessment, resuscitation, emergency operations, and stabilization and also arrange for transfer to a facility that can provide definitive trauma care when needed." Level IV trauma centers …" provide advanced trauma life support before patient transfer in remote areas where no higher care is available."[3] Michigan has an inclusive, voluntary trauma system where each facility participates in the system at the level of care that matches their resources.

3 American College of Surgeons Committee on Trauma, Resources for the Optimal Care of the Injured Patient 2014

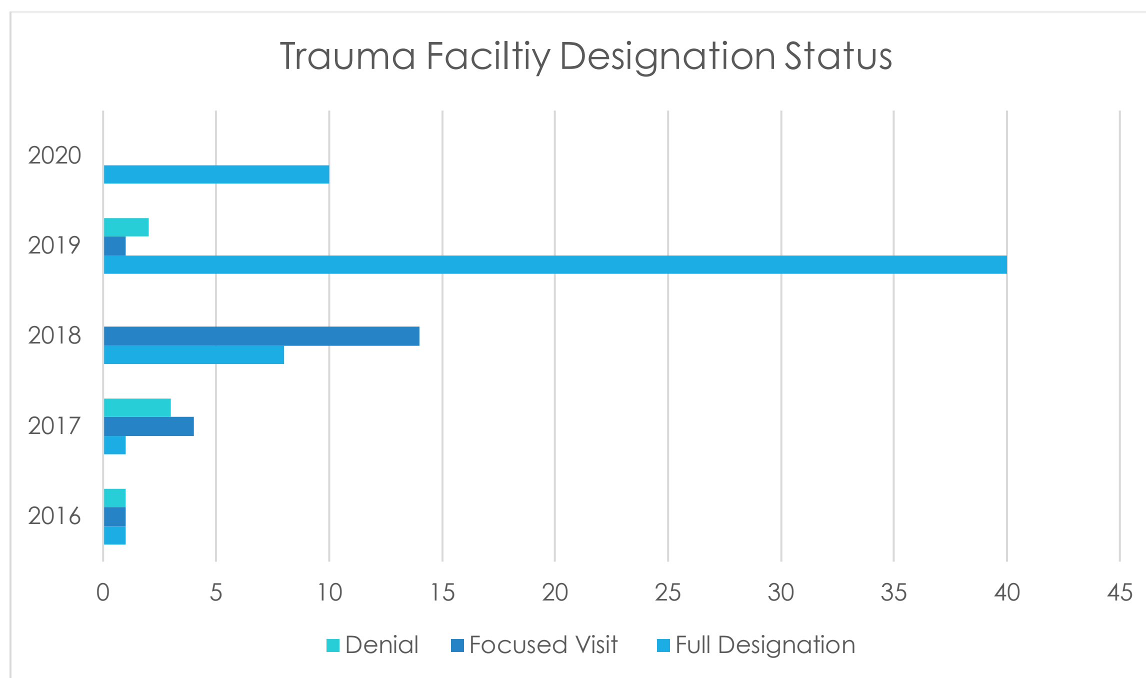
Verification criteria are evaluated by in-person site visits conducted by the ACS (Level I, II, III) or the State of Michigan (Level III, IV). Level III facilities may choose to be verified by either the ACS or the State. The criteria for verification are the same for either verification entity. In Michigan experienced trauma program staff (trauma medical directors, trauma program managers, physician assistants and nurse practitioners) who participate in Level I and Level II trauma programs form a pool of potential site reviewers. Site reviewers are scheduled to review programs that they have limited affiliation with and are not part of the trauma region in which they practice.

Designation

Designation is defined by the Oxford Dictionary 1.1 as "the action of choosing a place for a special purpose or giving it a special status."[4] Administrative Rule R325.129 Powers and Duties of the Department Rule 5 (b)(f) states that the department "develop a statewide process for the designation of trauma facilities."[2]

The Bureau of EMS, Trauma & Preparedness, Trauma Section has been designating trauma facilities since 2016 (Figure 2).

Figure 2

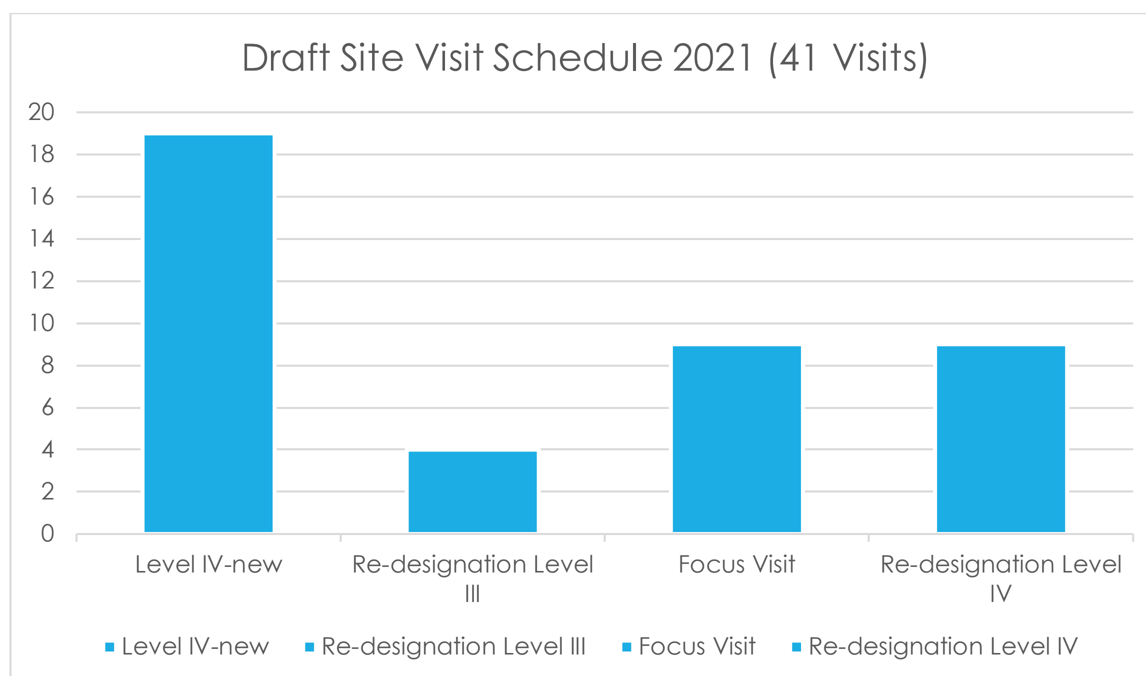


There were 124 acute care facilities that fit the basic qualifications for a trauma facility (emergency departments that operate 24/7 and have inpatient beds) 100% of these facilities indicated their intention to become designated trauma facilities. Of those, 105 have become designated trauma facilities. In 2020 approximately 19 planned site visits were scheduled to complete all initial site visits and close out the Provisional period (time frame put into place to allow for trauma program development). In March, the COVID-19 pandemic and subsequent shelter-in-place Executive Orders put

a halt to site visits. At the same time, the ACS-COT notified stakeholders that all facilities that planned or anticipated visits, would be deferred for one year. A guidance document was sent out April 14 https://www.michigan.gov/documents/mdhhs/Michigan_COVID19_Guidance_2020_Final_687011_7.pdf.

The Designation Committee meetings were cancelled in March, July, and September. A virtual meeting was held in November. There are ongoing discussions regarding the resumption of verification visits and what parameters must be met to resume, the implications to be addressed, and the impacts on trauma program development (Figure 3). Both the STAC and the Designation Committee will be asked to provide input on the issues.

Figure 3



The Designation Coordinator, assisted by the Region 1 Trauma Coordinator, revised the verification forms, including the Pre-Review Questionnaire, to align with the visit format, streamline the document, and include user suggested improvements. All the edits were reviewed by content experts. Further edits will be considered when the Committee on Trauma American College of Surgeons, *Resources for Optimal Care of the Injured Patient* next edition will be published sometime in 2021.

DMC Detroit Receiving Hospital participated in a virtual verification site visit (pilot project) from the American College of Surgeons on July 21-22. This visit was one of the first of its kind in the country. The Trauma Medical Director and Trauma Program Manager shared their experiences with the Trauma Section Manager and Verification/Designation Coordinator and staff. The best practices, barriers and challenges will be monitored as the pilot continues.

Data

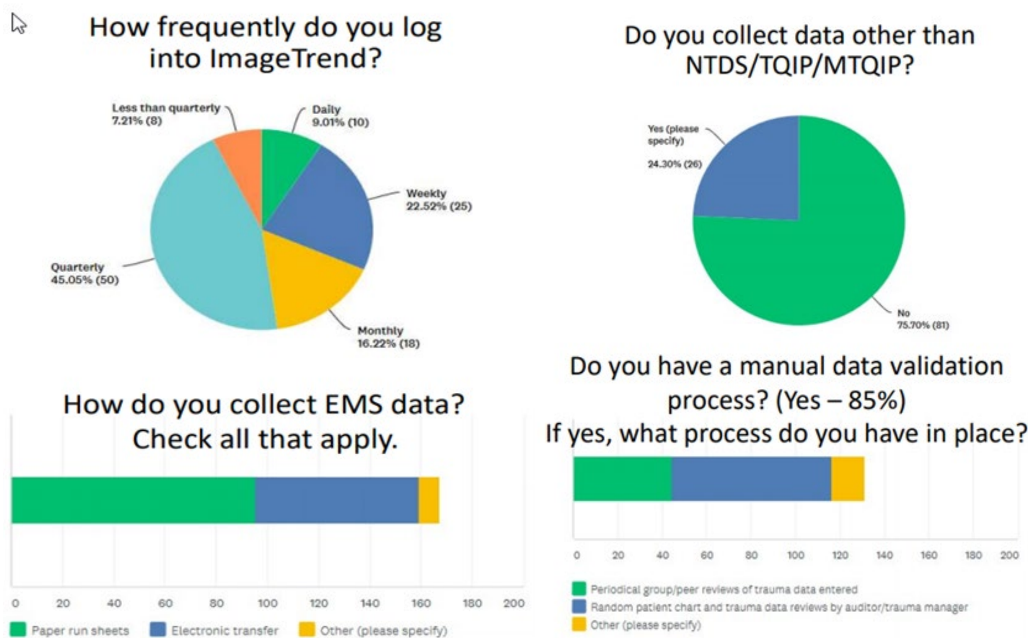
Data collection and submission is guided by Administrative Rule language. Rule 325.133 Rule 9 (1) *the*

department, with the advice and recommendations of the state trauma advisory subcommittee and emergency medical services coordination committee, shall develop and maintain a state trauma registry. The National Trauma Data Standards (NTDS) data elements are collected and submitted to the state trauma registry. Trauma facilities use privately purchased data collection software or directly enter data via ImageTrend®, a web-based data collection product provided by the Department.

Data is submitted quarterly and monitored for timeliness and completion. Most trauma facilities in Michigan transfer files from data software into the State Trauma Registry. There were 67,061 incidents reported in the registry (Jan-Dec 2019) and 28,705 incidents reported (Jan-June 2020). Ongoing discussions regarding methods to support and enhance accuracy, validity, and completeness began in earnest in 2020 and will continue in 2021. Access to the registry is managed by the submission of Data Use Agreement, and the assignment of a username and password from the State Database Administrator. The State Database Manager monitors user access and permission levels on a routine basis.

In 2019, an ImageTrend® user survey was conducted to gather information regarding registry usage, training, biggest challenges, data validation, etc.

Figure 4



User's experience in ImageTrend

Direct Entry/Upload

- Direct case entry – 41%
- Upload – 59%

Do you use Report Writer?

- Yes – 23%
- No – 60%
- I don't know what Report Writer is – 17%

ImageTrend Permissions

- Facility Staff – 26%
- Facility Administrator – 46%
- Unsure – 28%

If Facility Admin, do you use the Users Guide?

- Yes – 7%
- No – 26%
- Unaware of guide – 67%

ImageTrend Trainings/Education

How frequently would you attend ImageTrend trainings, if they were offered?

- Monthly – 13%
- Quarterly – 44%
- Bi-annually – 21%
- Annually – 23%

Interested in networking with others in region?

- Yes – 69%
- No – 31%

Which method of training would be most beneficial to you? (% extremely beneficial)

- Users guide on website – 56%
- In-person, group training in Lansing – 40%
- In-person, group training in region - 62%
- Training videos on website – 61%
- Webinar training session – 57%

ImageTrend Trainings/Education

How frequently would you attend ImageTrend trainings, if they were offered?

- Monthly – 13%
- Quarterly – 44%
- Bi-annually – 21%
- Annually – 23%

Interested in networking with others in region?

- Yes – 69%
- No – 31%

Which method of training would be most beneficial to you? (% extremely beneficial)

- Users guide on website – 56%
- In-person, group training in Lansing – 40%
- In-person, group training in region - 62%
- Training videos on website – 61%
- Webinar training session – 57%

The User Survey results informed the Back to Basics Trauma Registry Training conducted in September. The training was geared towards direct entry ImageTrend® users. There is a significant amount of turnover for the role of trauma data collection and data entry, particularly in the current pandemic environment. The training was presented in webinar format and recorded so new registry users could refer to the materials as needed. The training was organized around the following objectives:

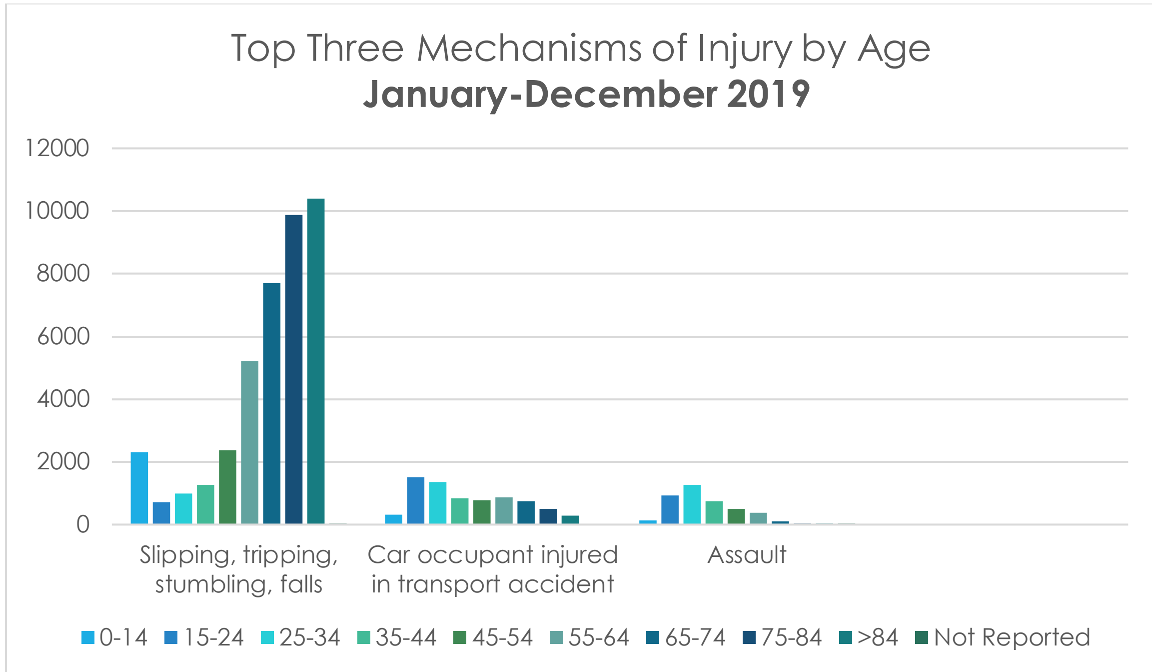
- Why trauma data is important.
- Where to find trauma data.
- What to do with trauma data.
- Gathering resources and tools.
- Registrar roles and responsibilities.
- Locating data and reporting guidelines.

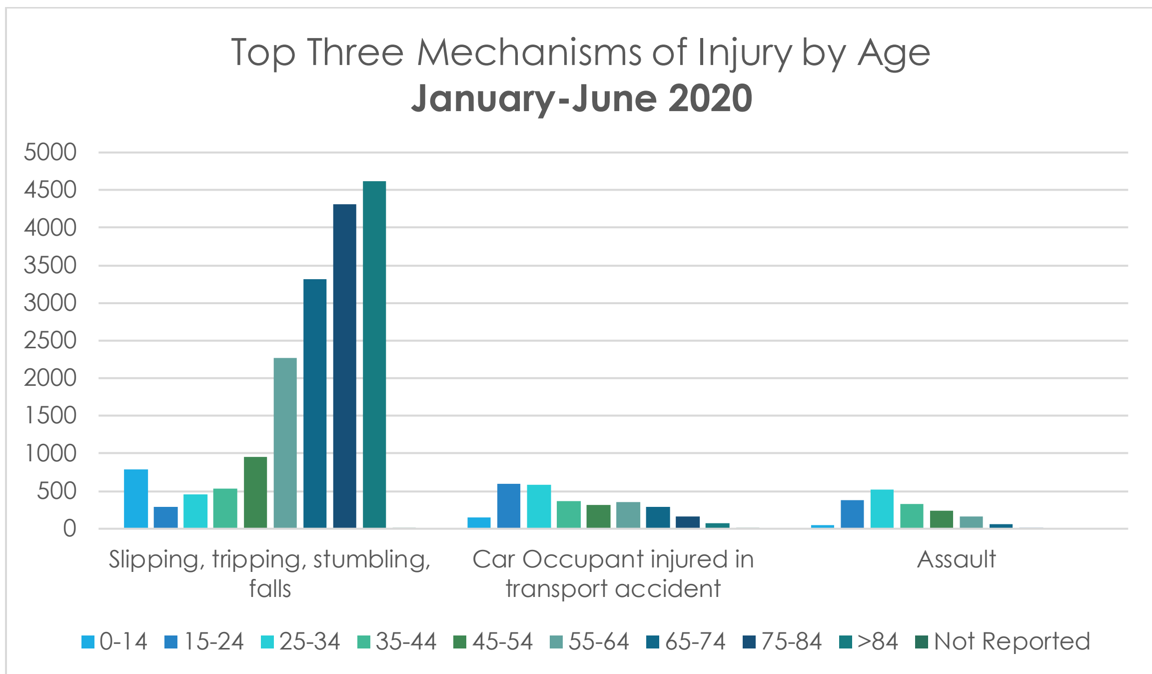
The National Trauma Data Set that is the foundation of the state trauma registry is updated annually. Software programs are adjusted to address the changes, including adding and removing elements. This occurs yearly in the fall. In 2020, the registry added COVID-19 data elements. In 2019, the ACS changed the data platform previously in use. This change required the data software vendors (Trauma Vendor Alliance) to partner with International Trauma Data Exchange (ITDX) via the cloud to submit data through a “data aggregator” prior to submission to the National Trauma Data Bank. This impacted some data entry in 2019, but now appears to be resolved. The data company Biospatial has been working in partnership with the EMS Section to develop reporting tools and data displays. Biospatial developed a program for Michigan that analyzes EMS data related to Field Triage criteria collected in the Adult and Pediatric Trauma Triage and Transport protocol. This data will be used by the RPSROs to better assess the triage and transport of trauma patients by prehospital providers.

Data is used to drive system performance, focus interventions, prioritize injury prevention, and measure the impacts of traumatic injury. In 2020, the Regional Professional Standards Review Organization (RPRSO) Inventory was used to begin collecting data on system metrics (twice a year). The information is reviewed by the RPRSO to monitor system functioning, partner participation, data submission, mechanism of injury, fatalities, hospital length of stay, etc. Identified issues are monitored and methods to address are discussed with the regional trauma network boards. Initiatives to address issues are monitored routinely to ensure resolution (loop closure).

Image Trend Data

Figure 5





System Evaluation

Performance improvement includes trauma system evaluation and is integral to establishing and maintaining a mature, robust system. Each Michigan trauma facility is responsible for continuous performance improvement that ensures…. "safe, efficient, and effective care to the injured patient. This effort should routinely reduce unnecessary variation in care and prevent adverse events (patient safety)."[4]

The Trauma Section embraces the Plan Do Study Act cycle (Figure 6) for the development of forms, policies, procedures, and initiatives that advance and maintain the system.

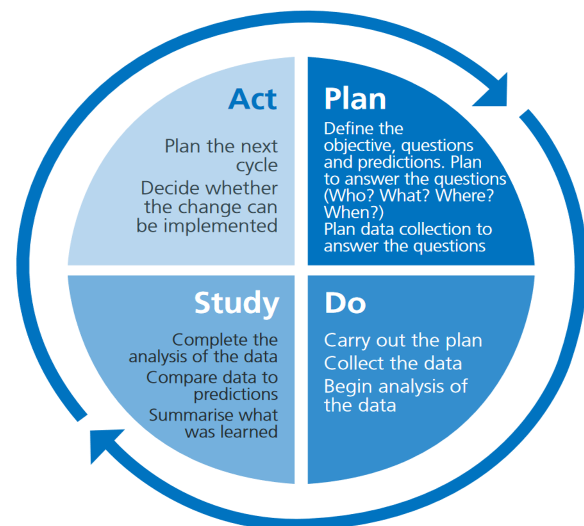
System evaluation is driven by Administrative Rule *Regional Performance Improvement.*

"Each regional trauma network is responsible for monitoring, assessing, and evaluating its regional trauma system to improve trauma care, reduce death and disability, surveillance of injury and implementation of injury prevention activities.

The performance improvement process shall include the following standards …and include all the following system components to be evaluated for pediatric and adults:

- *Components of the regional trauma plan*
- *Triage criteria and effectiveness*
- *Trauma center diversion*

Figure 6 PDSA cycle from National Health Service, UK



Intra-regional issues are brought to the attention of the respective RPSRO chairs for consideration and follow-up. The regional professional standards review organization reviews and monitors data such as mechanism of injury and state average length of stay. In 2019, the state average length of stay was five days, in 2020 the state average length of stay was 5.2 days. The RPRSO Inventory includes data from the Field Triage report as well.

4 https://www.hsdl.org/?abstract&did=463554

The inputs for system evaluation include:

- **Regional Trauma Network Quarterly and Annual** (replaces the 4th Quarter) **Reports**, these are discussed at STAC and posted https://www.michigan.gov/mdhhs/0,5885,7-339-71551_69345_69350---,00.html
- **The RPSRO Inventory** which is completed and reviewed biannually by the RPSRO. The RPSRO operates in accordance with MCL 331.531,331.533, 333.20175, 331.21513, 331.21515. This allows for confidential, professional review of issues and planning strategies needed to address those issues. The RPSRO focus is system issues and Administrative Rule driven metrics. Issues related to prehospital care and in-hospital care are managed by their respective PI committees. The RPRSO template outlines the responsibilities for the two step, primary and secondary review. A tracking tool is used to monitor issues. and a flow chart describes the communication process.

REGIONAL PERFORMANCE IMPROVEMENT PLAN 2021

REGION ________

Philosophy of Regional Trauma Program

The Regional Professional Standards Review Organization (RPRSO) as defined in Administrative Rules "means a committee established by the regional trauma network for the purpose of improving the quality of trauma care in a recognized trauma region as provided in MCL 331.531 to 331.533." . It will be the body that is responsible for monitoring, evaluating, and improving the performance of the Regional Trauma program in order to reduce variation in care and promote optimal patient outcome. Established criteria will be utilized to monitor performance with emphasis on identification of trends, opportunities for improvement, and implementation of evidence based best practice methodology.

Mission and Vision of the Performance Improvement and Patient Safety

PI is a continuous process that allows for a regional, multidisciplinary, system approach to problem identification, data driven analysis and problem resolution. Issues are identified by monitoring collected data and/or event identification documented in the Regional Professional Standards Review Organization Inventory and/or system issues identified by RPRSO Chairs that have patient care issues in common.
Indicators for review may be monitored yearly (reported in the annual report) biannually (reported in the Inventory) or at a region determined frequency. Indicators monitored at the RPRSO are system metrics, individual patient care issues are managed at the facility or agency level. RPRSO chairs are responsible for determining if care issues rise to the level of system impacts

Purpose
According to Administrative Rule 325.135 Rule 11 (1) " Each trauma care region shall be required to develop and implement a regional trauma performance improvement plan…include the following system components to be evaluated (a) components of the regional trauma plan (b) triage criteria and effectiveness (c) trauma center diversion (d) data analytics as defined by the department with the advice of the statewide trauma advisory subcommittee."

Authority and Responsibility:
Administrative Rule 325.135 Rule 11 (2) states "Each regional trauma network is responsible for monitoring, assessing, and evaluating its regional trauma system to improve trauma care, reduce death and disability, surveillance of injury, and implementation of injury prevention activities."
The Trauma Section Policy 900-14 dated July 24, 2019 describes the following Performance Improvement plan:

- **The Regional Trauma Network Applications** which are submitted triennially, describe the workplan goals and objectives the regions will address. The workplans are based on the indicators and objectives described in the HRSA 2006 *Model Trauma System Planning and Evaluation*[5] document, the Administrative Rules, and the *Michigan Trauma System Strategic Plan 2018-2023*.
- **Michigan Trauma System Strategic Plan 2018-2023** outlines the mission, vision, goals and objectives that support the maturing trauma system. In 2020 the Trauma Section began multiple initiatives related to the "pillars" or foundations of the strategic plan including: communication, infrastructure, injury prevention, education, continuum of care, regional performance improvement, data, verification, evaluation and enhanced collaboration with Preparedness. The Pillar Projects are ongoing and reported to the STAC annually.

2019 Trauma Conference

The 2019 Trauma Conference was held on October 23, 2019 at Crystal Mountain in Thompsonville, Michigan. This conference allowed participants to learn from different presentations ranging from case studies, care of special populations, data collection, and efficient billing practices. There were 307 attendees at the conference.

The evening before the Trauma Conference, the Trauma Section sponsored a Leadership Summit. The meeting convened all the regional committee chairs and provided an opportunity for regional leadership to share best practices, local challenges and to enhance the visibility of the trauma system from different geographic perspectives. The agenda included a presentation by Dr. Wayne Vanderkolk, "The Evolution of Michigan's Trauma System" and an introduction and review of the revised regional trauma network application and the inaugural RPRSO Inventory.

MTQIP

The Michigan Trauma Quality Improvement Program and the BETP Trauma Section have been working in collaboration with the designated Level III facilities in Michigan on risk adjusted benchmarking. This initiative provides an opportunity for Level III facilities to compare performance with like facilities in the State to improve outcomes, discuss evidenced based practices, use data to drive care, and learn in a collaborative environment.

- The Michigan Trauma Quality Improvement Program (MTQIP) is a quality improvement program managed by the University of Michigan. MTQIP is working in collaboration with the Bureau of EMS, Trauma & Preparedness (BETP) to provide data to designated Level I, II and III trauma facilities, the regions, and the state. The data is used to monitor system function and drive performance improvement. MTQIP and volunteer Level III trauma facilities are participating in a data quality project auditing data entry. The project has demonstrated an overall disagreement rate of 1.9%.

Figure 7

mortality overall by year trend*

ed_arryear	mean	sum	N
2013	4.4%	1,126	25,807
2014	3.2%	1,107	34,732
2015	3.2%	1,175	36,409
2016	3.1%	1,441	45,844
2017	2.9%	1,491	50,696
2018	2.6%	1,408	53,275
2019	2.5%	1,428	56,861
Total	3.0%	9,176	303,624

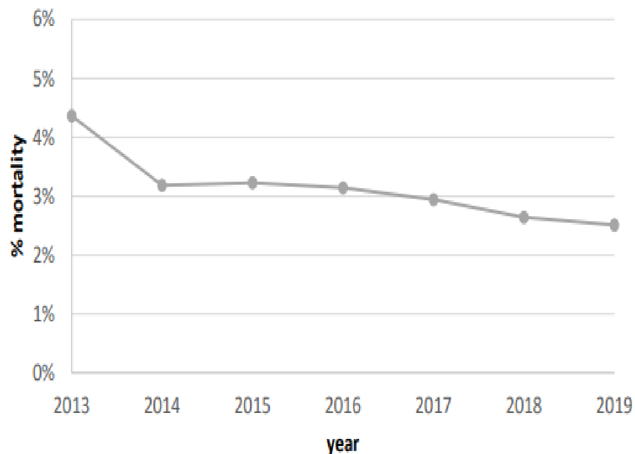


Figure 8

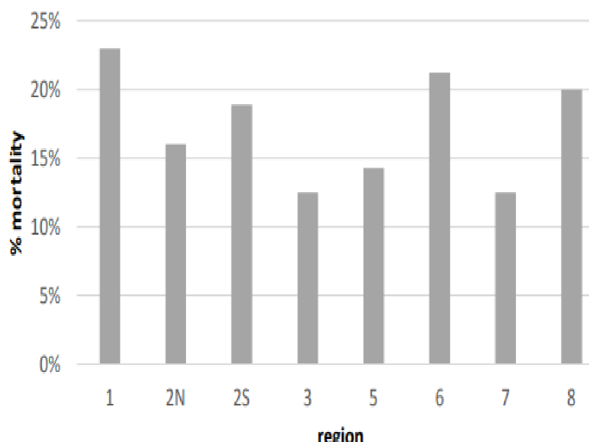
patients by transportation mode

	transportation mode					
region	ground	helicopter	fixed-wing	private	police	other
1	3,928	14		1,327	30	41
2N	8,236	3	1	4,008	36	7
2S	12,584	43		5,367	107	16
3	5,252	123	2	2,248	26	2
5	2,401	75		595	8	
6	5,041	143		1,350	9	4
7	1,312	34		646	6	1
8	781	13		339	3	3
Total	39,535	448	3	15,880	225	74

Figure 9

mortality cohort 5 - penetrating

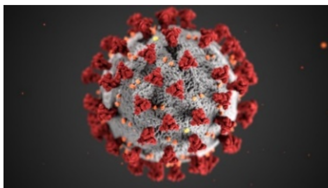
region	mean	sum	N
1	23.0%	20	87
2N	16.0%	25	156
2S	18.9%	147	778
3	12.5%	25	200
5	14.3%	12	84
6	21.2%	31	146
7	12.5%	3	24
8	20.0%	2	10
Total	17.8%	265	1,485



Stop the Bleed

The BETP Trauma Section has supported the STOP the Bleed initiative spearheaded by the American College of Surgeons since 2017. The Regional Trauma Coordinators have been instrumental in supporting trainings, distributing training kits and instructing courses. The need to suspend in person training events because of COVID-19 has put these training opportunities in temporary hiatus.

COVID-19



The Michigan Department of Health and Human Services and many partners stakeholders including the trauma community have been mobilized to address the COVID-19 pandemic response since the first reported case in the U.S. in January and in Michigan on March 10.

The initial impact on the trauma regions was varied and staggered in timeline. The more populous regions of Region 2 South (includes the City of Detroit) and 2 North began reporting increased numbers of cases in April and May. Other counties followed with reports of cases increasing overall as the year went on. There are no counties in the state that have not reported cases.

The State of Michigan quickly mustered an orchestrated response from the Public Health Administration, the local county health departments, individual healthcare providers, and many other partners and stakeholders. Trauma facilities added bed space and trauma program staff were deployed to care for COVID-19 patients or take over responsibilities for those that did. Collaboratives and

conference calls were instituted to quickly share care strategies and details about the course of the infection to better understand the disease and what may be effective treatments. Personal protective equipment (PPE) management, aerosolizing procedures, identifying COVID-19 positive patients and the implications of trauma activations were discussed and shared.

Regional initiatives were placed on hold to preserve resources. Trauma Section staff supported the healthcare coalitions, the provider hotline (providing information on testing to healthcare providers) and data collection on capacity. State staff moved seamlessly to remote work. Meetings were held virtually to reduce exposure and allow hospital staff to meet without impacting travel restrictions.

As the last quarter of 2020 comes to a close, case numbers appear to be on the increase. The trauma system is anticipating an uptick in injuries with the absence of lock down orders, increase in domestic violence, and motor vehicle accidents etc. However, lessons learned are being reviewed, effective strategies such as masking, social distancing, hand washing, and flu vaccinations have been promoted to positively impact projected case increases.

The trauma system in Michigan has move from concept to a fully functioning system. Data shows the impact the system has had on decreasing overall mortality, attendance at the conferences, advisory meetings, and regional committees demonstrates the commitment to the system by partners, stakeholders and individuals. The response to the unprecedented events of 2019 illustrates how the system can pivot to meet the needs of communities and residents. Using resources efficiently, effectively, building partnerships, collaborations and removing silos is central to this system.

The system will continue to mature, building and maintaining resources, flexing to meet challenges like those seen in 2019, and demonstrating that a responsive, regionalized, coordinated and accountable system dedicated to the care of injured Michigan residents and visitors is a vital asset.