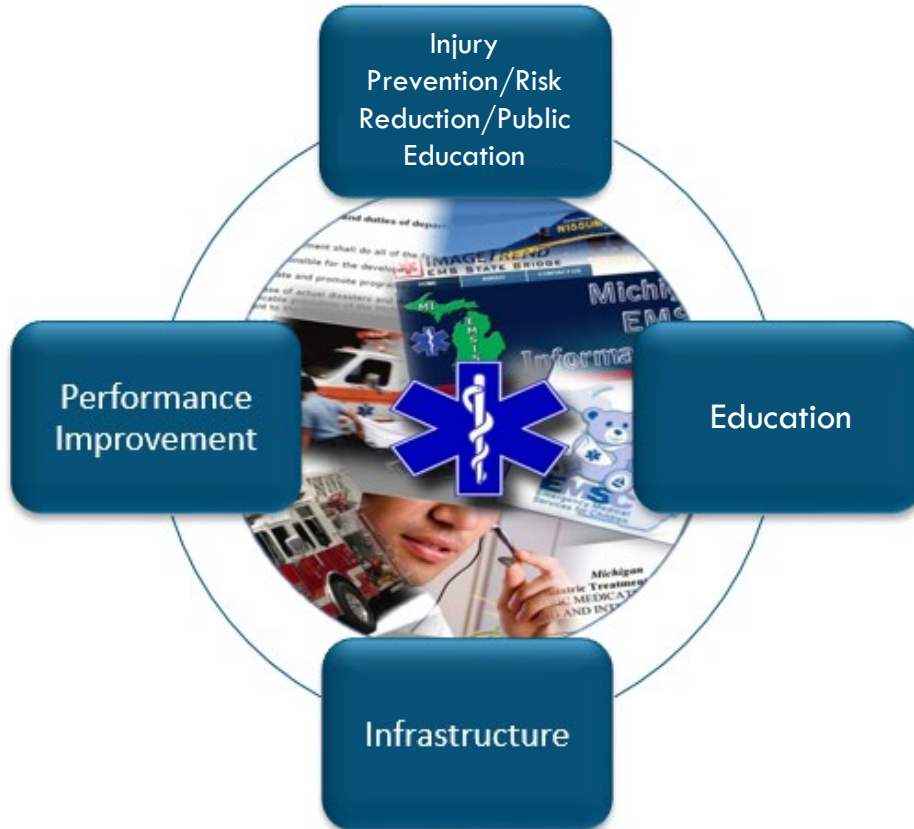


Michigan Systems of Care

Trauma/Stroke/ST-Elevation Myocardial Infarction (STEMI)

Projects

2023



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Division of Emergency Preparedness, EMS, and Systems of Care

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Background

Michigan has been engaged in system development for many years. The trauma system has evolved, matured, and is effectively caring for traumatically injured residents and visitors. Recently, the Michigan Department of Health and Human Services and partners have been engaged in developing a plan and Administrative Rules to address the time sensitive emergencies that are caused by stroke and ST-elevation myocardial infarction (STEMI). Like trauma, stroke and STEMI require quick recognition, response, and timely care to support positive patient outcomes.

Funding for the trauma system in 2012 provided the resources to build the system described in statute and rules. Maintaining the gains made in system development including training, equipment, and injury prevention initiatives require ongoing support. Over the past seven years the Bureau of Emergency Preparedness, EMS and Systems of Care Trauma has been able to support 782 individual projects focused on education, injury prevention, performance improvement and infrastructure. In 2023 the Bureau was able to expand this support and offer the same opportunity for programs engaged in developing or strengthening care delivery for stroke and/or STEMI patients.

The Michigan Systems of Care Trauma, Stroke and STEMI Projects were designed to address four broad categories of system building: Injury Prevention/Risk Reduction, Education, Infrastructure and Performance Improvement. A total of 311 projects were awarded funding, the breakdown of funding categories is depicted in Figure 1.

Figure 1. Breakdown of Trauma System Development Project Categories Funded

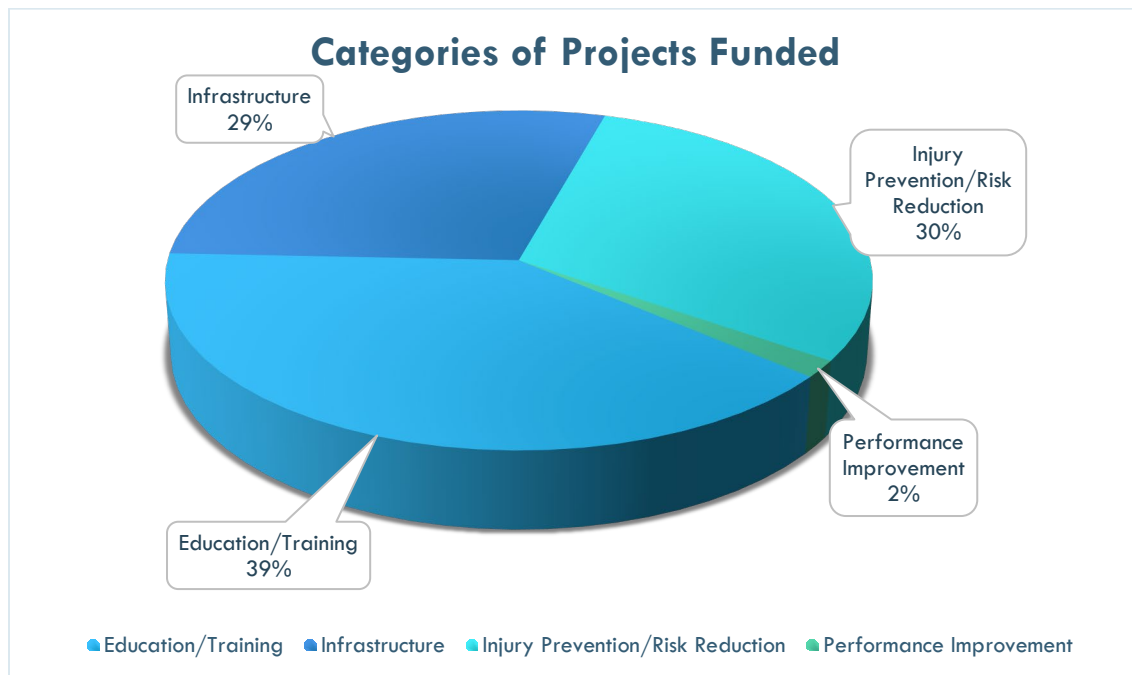
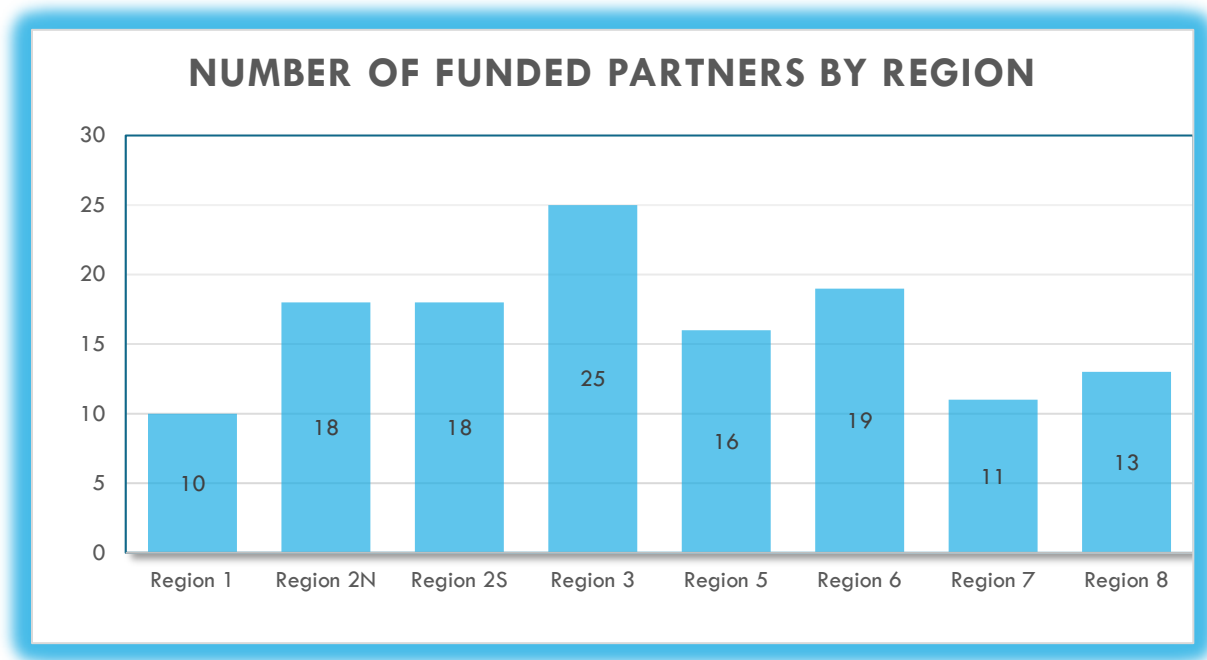


Figure 2 displays the breakdown of the number of partners in each region of the state.

Figure 2. Breakdown of Funded Partners by Region



Each partner was able to use and distribute the funding in the described categories for activities and initiatives that supported the trauma system and the establishment of the stroke and STEMI system.

The Regional Medical Control Authority Network were the identified Project Leads and were responsible for project management, interfacing with trauma partners and stakeholders. The projects started in January 2023 and were completed by August 2023. This report describes some of the projects that represent each of the four categories.

Trauma, Stroke and STEMI Education

A competent, trained workforce is foundational to successful systems. An aware population that understands that time sensitive emergencies require prompt access to the system will support positive outcomes.

Time sensitive systems by design work with compressed timelines that require rapid decision making, timely arrival to the appropriate facility and care delivered by staff who have been trained in the current care guidelines and protocols. As noted by Berwick D et al “Trauma is complex. It can result in life- and limb-threatening injury, multiorgan failure, massive tissue damage, and physiologic dysfunction. To save lives and minimize disability in the face of such

destruction requires a system of care with a diverse network of professionals capable of rapidly responding and delivering lifesaving interventions.”¹

“Acute ischemic stroke patients are vulnerable, and communication among various disciplines in the treatment and care of this population is critical,” said Mary L. Rodgers, D.H.A., A.N.P., C.N.S., R.N., chair of the statement writing committee, quality manager for the VA Western New York Healthcare System in Buffalo, New York, and a reviewer for The Joint Commission. “Critical assessments must be done to care for and intervene for this at-risk patient population. These can help to safeguard the patient and improve patient outcomes, thus increasing the opportunity to maintain quality of life after a stroke.”²

Patient delay in recognizing and acting on signs and symptoms of a heart attack is one of the greatest obstacles to timely and successful STEMI care. In the United States, the time from sign and symptom onset to the median time of first medical contact (FMC) by EMS is 87 minutes and 120 minutes when the patient presents directly to the emergency department (ED). A delay in accessing care for patients with heart attack may lead to presentation with hemodynamic instability, acute heart failure, or cardiac arrest. In addition to waiting to engage the system of care, 40% of patients do not call 9-1-1 and instead present themselves to the ED, negating the opportunity for concurrent collaborative response by EMS, the ED, and the CCL.”³

Systems of Care partners used grant funding to provide education and training for topics ranging from Trauma Nursing Core Course (TNCC) to Advanced Neuroimaging for stroke care, Active Shooter Preparation Training (ALICE®), and included the opportunity to attend professional conferences with systems of care focus. The following are some of courses offered:

- Abbreviated Injury Scale and Injury Scoring (AIS): 4 courses
- Advanced Burn Life Support (ABLS): 1 course
- Advanced Cardiac Life Support (ACLS): 2 courses
- Advanced Stroke Life Support (ASLS): 1 course
- Advanced Trauma Life Support (ATLS): 1 course
- Active Shooter Preparation Training (ALICE®): 2 courses
- American Trauma Society (ATS): 1 course
- Basic Life Support/Advanced Life Support Instructor (BLS/ACLS): 1 course
- Board Certification Emergency Nursing (BCEN): 1 course
- Certified Abbreviated Injury Scale Specialist (CAISS): 1 course
- Certified Neuroscience Registered Nurse (CNRN®): 6 courses

¹ National Academies of Sciences, Engineering, and Medicine. 2016. A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury. Washington, DC: The National Academies Press. <https://doi.org/10.17226/23511>.

²AHA Scientific Statements published March 11, 2021 Updated Guidance Confirms Crucial Role of Nurses for Patients with Acute Ischemic Stroke <https://newsroom.heart.org/news/updated-guidance-confirms-crucial-role-of-nurses-for-patients-with-acute-ischemic-stroke>

³ Jacobs, A et.al System of Care for ST-Segment-Elevation Myocardial Infarction A Policy Statement from the American Heart Association Circulation. 2021;144:e310–e327. DOI: 10.1161/CIR.0000000000001025 retrieved from <http://ahajournals.org> on January 2, 2024

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- Emergency Nursing Pediatric Course (ENPC): 5 courses
 - ICD-10 coding: 2 courses.
 - Pediatric Care After Resuscitation (PCAR): 6 courses
 - Prehospital Trauma Life Support (PHTLS): 2 courses
 - Rural Trauma Team Development Course (RTTDC): 1 course
 - Trauma Advanced Registrar Prep Course (TARP): 6 courses
 - Trauma Care After Resuscitation (TCAR): 30 courses
 - Trauma Certified Registered Nurse (TCRN): 6 courses
 - Trauma Nursing Core Course (TNCC): 9 courses
 - Trauma Outcomes and Performance Improvement Course (TOPIC): 5 courses
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Public Awareness Campaigns

Community Coffee Sleeve Project: Stroke is the 5th leading cause of death and the leading cause of disability in the U.S. May is Stroke Awareness Month and we would like to take the opportunity to promote stroke awareness in our community. Our plan is to distribute printed coffee sleeves to the local coffee shops for use during the month of May. These sleeves will be printed with information on the signs and symptoms of a stroke, need to dial 911 and a QR code that is linked to MyMichigan Health's online Stroke Risk Assessment. The target population includes the patrons visiting these coffee shops in our local communities. The goals include the ability to recognize signs and symptoms of a stroke and to stimulate interest in taking the Stroke Risk Assessment

A total of 85 grants were awarded that allowed Systems of Care partners to assess the knowledge gaps in their facilities and their communities and provide the education to bridge those gaps.

Injury Prevention, Risk Reduction, Public Education

Unintentional injuries, heart disease, and stroke have been in the top five leading causes of death in Michigan for more than twenty years. In 2020, injuries took the lives of 6,568 Michiganders, stroke 5,771 and heart disease 26,651.⁴ Living with a disability and years of potential life and work lost as a result of unintentional injury contributes to an enormous burden caused by these injuries to Michigan residents. Stroke and STEMI have similar impacts in terms of potential complications, demands on caregivers and risk management (patients who

⁴ Jacobs, A et.al System of Care for ST-Segment-Elevation Myocardial Infarction A Policy Statement from the American Heart Association Circulation. 2021;144:e310–e327. DOI: 10.1161/CIR.0000000000001025 retrieved from <http://ahajournals.org> on January 2, 2024

have had a stroke are four times more likely to have another stroke).⁵ Prevention and risk reduction are the best ways to decrease the morbidity and mortality associated with trauma, stroke, and STEMI. Healthcare providers are committed to supporting prevention efforts that decrease the impacts of these time sensitive emergencies.

There were 73 grants awarded for injury prevention and/or risk reduction initiatives. The programs described demonstrate the injury prevention and risk reduction initiatives that reflect specific community needs addressed in unique ways.

The grants supported efforts that included fall prevention including Matter of Balance classes, the distribution of bike helmets and bike lights, the purchase of an upgraded distracted driver simulator, stroke education, special car seats for infants vulnerable to airway issues, life vest stations are just some of the projects.

Stroke Community Education and Risk Reduction

Several grants supported stroke prevention and managing recovery after a stroke. A stroke “Pop-up Clinic” that provided cholesterol and blood sugar testing and community education was sponsored. For patients at risk of stroke or patients discharged after a stroke, automatic blood pressure machines, healthy eating cookbooks, and fitness trackers were purchased to assist in their recovery and to manage their risk factors and prevent a recurrence.



www.ama-assn.org/system/files/2020-06/7-step-smbp-quick-guide.pdf

Distracted Driving Kits

In Michigan in 2021 16,543 crashed involved a distracted driver.⁶ The National Highway Traffic Safety Administration reported that over the past ten years 2011-2020 more than 32,400 people died in distraction-affected crashes.⁷ A grant was awarded to a program that purchased drunk/distracted driving education kits. The program also purchased concussion goggles that mimic the sensations that occur with concussion or a traumatic brain injury. Participants in the education program are asked to do simple tasks like standing from a chair, touching a wall, and sitting back down. Other tasks may include walking in a straight line and moving pegs from one

⁵ Chohan s et al. Long Term Complication of stroke and Secondary Prevention: An Overview for Primary Care Physicians [Singapore Med J](https://doi.org/10.11622/smedj.2019158), 2019 Dec; 60(12): 616–620. doi: [10.11622/smedj.2019158](https://doi.org/10.11622/smedj.2019158) retrieved on January 2, 2024 from [ncbi.nlm.nih.gov/pmc/articles/PMC7911065/#:~:text=Patients%20who%20had%20a%20stroke,smoking%2C%20can%20reduce%20stroke%20recurrence](https://pubmed.ncbi.nlm.nih.gov/pmc/articles/PMC7911065/#:~:text=Patients%20who%20had%20a%20stroke,smoking%2C%20can%20reduce%20stroke%20recurrence)

⁶ Michigan State Police Michigan Office Highway Safety Planning, Traffic Safety Programs, Michigan Traffic Crash Facts Driver Distraction retrieved on January 2, 2024 from https://www.michigantrafficcrashfacts.org/doc/gtsac/driver_distraction

⁷ Michigan State Police Michigan Office Highway Safety Planning U Drive U Text U Pay Fact Sheet and Talking points retrieved from on January 2, 2024 from https://www.michigantrafficcrashfacts.org/doc/gtsac/driver_distraction

of the peg boards to the other. The goggles create a visual disconnect, hesitation, disorientation, dizziness, and confusion. Understanding how concussions impact everyday life activities helps professionals and lay people better appreciate the challenges and support recovery.

Stop the Bleed

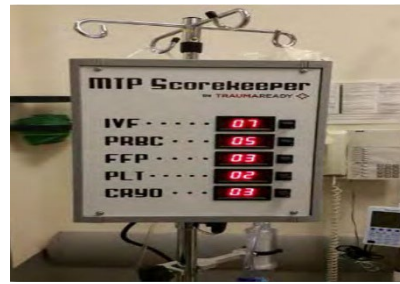
Several grantees were able to purchase Stop the Bleed kits and training materials. These kits are particularly important to have available in rural communities to assist with bleeding control of the injured when definitive medical care is miles away and travel occurs in remote areas. Some of the grantees used the funding to purchase Stop the Bleed Stations which are wall mounted and often placed near the automatic defibrillator to provide an equipment source for emergencies when prehospital providers are not immediately available.



<https://www.bleedingkits.org/all-products/premium-personal-stop-the-bleed-station.html>

Massive Transfusion Protocol Scorekeeper

The MTP Scorekeeper is a lighted scoreboard that keeps track of each transfused blood component this allows the ratios to stay on track and to carefully monitor blood volumes



<https://trauma-news.com/wp-content/uploads/2016/06/MTP-Scorekeeper-Investor-Info.pdf>

Infrastructure

Michigan currently has 107 Designated trauma facilities ranging from multi-bed Level I trauma hospitals to small, 35 bed critical access hospitals. A significant number of these are smaller facilities serving rural communities with fewer resources than the Level I and Level II trauma facilities located in more urban areas of the state. The annual cost to stay ready to care for the injured in a Level II trauma facility is \$2,333,113.00.⁸ Michigan has 28 Level II trauma facilities.

⁸Ashley DW, Mullins Rf et. al (2017) What are the Cost of Trauma Center Readiness? Defining and Standardizing Readiness Costs for the Trauma Center Statewide AmSurg, 2017 Sept;83(9):979-990 [What Are the Costs of Trauma Center Readiness? Defining and Standardizing Readiness Costs for Trauma Centers Statewide - PubMed \(nih.gov\)](https://pubmed.ncbi.nlm.nih.gov/31111111/)

Systems of Care for stroke and STEMI are in the early stages of development support from the grants enabled facilities to engage in a review of resources and gaps that need to be addressed. Timelines were tight and the grants were new to these programs so there were fewer specific infrastructure focused requests, however several of the resources that were procured will assist care delivery for many patients including those injured or having a stroke or STEMI.

One example of infrastructure support was the purchase of a Pupilometer which is a device that provides an objective assessment of pupillary size and reactivity. The data provided by the device allows the examiner to identify real time changes to the patient's pupillary response giving practitioners the ability to intervene earlier if there is rising intracranial pressure and a potential for brain injury.

The grants supported 72 infrastructure projects which included the purchase of fluid warmers, splints, pelvic binders, rapid infusers, respiratory monitors, LUCAS devices (automated chest compression devices that enable hands free compressions during CPR), an external defibrillator and a Stryker trauma stretcher with clear view x-ray technology. Providing these resources allows scarce dollars to be applied to other essentials.

Conclusion

Michigan is committed to supporting systems of care for time sensitive emergencies and ensuring that patients get to the right resources at the right time. The grants have been system stakeholder directed, stakeholders assess their needs related to the broad system categories outlined and then use the resources they have been awarded to improve patient care, patient outcomes, educate their communities in order to prevent injuries, strokes and STEMI. Each project is unique and driven by facility needs, the needs of the community, a promising practice or to address an identified gap. The Bureau of EMS, Trauma and Preparedness is committed to supporting this kind of collaboration with partners, encouraging education and training, disseminating best practices, engaging in robust performance improvement, and meeting challenges with practical solutions.