

Michigan Emergency Medical Services Case Definition of Probable Opioid Overdose

This definition supports public health workers in state, tribal, local, and territorial jurisdictions to utilize emergency medical services (EMS) data to identify probable opioid overdoses responded to by EMS.

For comments or questions, email MDHHS-MODASurveillance@michigan.gov.

Background

Michigan Emergency Medical Services (EMS) agencies report information regarding EMS responses electronically to the Michigan Department of Health and Human Services (MDHHS) through the Michigan EMS Information System (MI-EMSIS). This data can be accessed by authorized users via ImageTrend Elite. MI-EMSIS aligns with the national EMS reporting system (NEMSIS – National EMS Information System). More information regarding NEMSIS can be found here: <https://nemsis.org/what-is-nemsis/how-nemsis-works/>. The required elements to be reported to MI-EMSIS are found here: [Required elements \(PDF\)](#)

As of September 2019, all EMS agencies in Michigan report data to MI-EMSIS. Michigan currently operates under NEMSIS 3, specifically Version 3.5. Michigan began the transition from NEMSIS 2 to NEMSIS 3 in 2018 and stopped accepting NEMSIS 2 data from EMS agencies on Jan. 1, 2019. Differences between NEMSIS 2 and NEMSIS 3 may affect the analysis and interpretation of historical data.

EMS data collection

After an EMS incident response has been completed, the on-scene providers submit a Patient Care Record (PCR) to their corresponding EMS agency, which then transfers the information to MI-EMSIS and then NEMSIS. While each state is different, the Council of State and Territorial Epidemiologists (CSTE) estimates that NEMSIS receives about 40% of records within 24 hours of an incident.¹

Querying MI-EMSIS Data for Probable Opioid Overdoses

The MDHHS Michigan Overdose Data to Action team defines a “probable opioid overdose” using EMS data as follows:

Case Definition²

One point is tallied for each of the following indicators that is present. The resulting number of points (potential values 0-7) is called the opioid overdose score (MI-EMSIS variable name listed in *italics*):

1. EMS impressions:
 - a. First or Second Provider Impression (*eSituation.11/eSituation.12*) lists an ICD-10-CM code in the range T36-T50 indicating overdose; and/or
 - b. First Provider Impression (*eSituation.11*) indicates opioid use disorder (F11).
2. Chief Complaint (*eSituation.04*) or Narrative (*Narrative.01*) mentions opioids: “opioid,” “opiate,” “heroin,” “morphine,” “codeine,” “fentanyl,” “hydrocodone,” “hydromorphone,” “methadone,” “oxycodone,” brand names, and misspellings.
3. Chief Complaint (*eSituation.04*) or Narrative (*Narrative.01*) mentions overdose: “od,” “o/d,” “overdose,” and misspellings for overdose.

¹ https://nasmso.org/wp-content/uploads/EMS-Nonfatal-Opioid-Overdose-Case-Definition_V5.pdf

² This case definition was adapted from the Public Health – Seattle & King County’s EMS Opioid Overdose case definition for use in Michigan (<https://kingcounty.gov/depts/health/overdose-prevention/non-fatal.aspx>).

4. Respiratory distress/depression:
 - a. Initial Respiratory Rate (*eVitals.14*) of less than 11 and/or
 - b. Chief Complaint (*eSituation.04*) or Narrative (*Narrative.01*) mentions respiratory distress/depression: “sob,” “apneic,” “bradypnea,” “shallow respirations,” “respiratory depression,” “respiratory arrest,” “difficulty/trouble breathing,” “respirations decreased,” “breathing problems,” “breathing shallow,” “breathing rate slow,” “not breathing,” “breaths were poor,” “ventilations,” “barely breathing,” along with misspellings. An incident is not considered to have narrative mention of respiratory symptoms if the terms are preceded by a negative (“no,” “not,” “denies,” “denied”).
5. Consciousness:
 - a. Initial Glasgow Coma Scale (*eVitals.23*) of less than 15 and/or
 - b. Chief Complaint (*eSituation.04*) or Narrative (*Narrative.01*) mentions altered level of consciousness: “loc,” “ams,” “unresponsive,” “only responsive,” “altered mental status,” “decreased consciousness,” “semiconscious,” “not responding,” “passed out,” “consciousness declined,” “altered loc,” “altered level of consciousness,” “not responsive.” An incident is not considered to have narrative mention of altered level of consciousness if the narrative contains the phrases “no loss of consciousness,” “denies loss of consciousness,” or “no loc.”
6. Treatment:
 - a. Medications (*eMedications.03*) contains “Narcan”, “naloxone”, “Opvee”, “nalmeferne”, or “Kloxxaxo”; and/or
 - b. Procedures (*eProcedures.03*) contains “valve,” “cardiopulmonary,” “chest compressions” or “oxygen mask”; and/or
 - c. Chief Complaint (*eSituation.04*) mentions “Narcan” or Narrative (*Narrative.01*) includes the terms “rebreath,” “bag valve,” “bag mask,” “Narcan” (and misspellings), “nalox,” “Opvee”, “nalmeferne”, or “Kloxxaxo”, “CPR” or “compressions.”
7. Eyes:
 - a. Chief Complaint (*eSituation.04*) or Narrative (*Narrative.01*) contain “pinpoint pupil,” “pupils are constricted”, “pupils were constricted,” “to be pinpoint” or “pupils are/were pinpoint.”

A person has an opioid overdose³ if one of the following circumstances applies:

- A. An opioid overdose score of 5 or greater.
- B. An opioid overdose score of 4 and at least one of the first three indicators is present.
- C. The person improved after being administered Narcan, regardless of score.

This syndrome is restricted to incidents where the Type of Service (*eResponse.05*) is “911 response (scene),” “intercept,” or “mutual aid.” To remove duplicate responses captured within MI-EMIS (which occurs when multiple units respond to and report an incident to MI-EMIS), this syndrome is restricted to only incidents where the Response Primary Role of the Unit (*eResponse .07*) is “Ground Transport” (ALS, BLS, and/or Critical Care).

³ The following criteria are used to exclude potential false positives (cardiac arrest not involving drug overdose and opiates taken within the context of hospice care):

- 1) opioid overdose cases where “cardiac” is mentioned in the primary complaint AND the patient age is greater than or equal to 70 AND the patient does not respond to naloxone are removed;
- 2) opioid overdose cases where “hospice” is mentioned in the patient care narrative AND the patient does not respond to naloxone are removed.

