Opioid Overdose Data FAQ

Quick Navigation

EMS Data

What are Emergency Medical Services (EMS) data?

Montana statute 37.104.212 requires that all licensed ground and air transporting EMS agencies submit a patient care report (PCR) for each patient they encounter during an EMS incident. Non-transporting agencies may also submit data, though they are not required. EMS data includes patient demographics (e.g. age and sex), circumstances of the incident, condition of the patient, any medications provided or interventions done, and transport/disposition. The dataset includes structured variables, as well as a narrative field where providers enter a free text narrative about the incident.

What is NEMSIS?

NEMSIS stands for National EMS Information System. NEMSIS is the official EMS data collection standard for all EMS agencies in the country. It is an information systems compliance architecture which allows for standardization of data across different data systems, EMS agencies, and states. NEMSIS provides consistent definitions for data elements used in EMS and pre-hospital care settings. Montana has collected NEMSIS 3.4 data since January 2017, and began transitioning to NEMSIS v3.5 in September 2023, although some EMS agencies are still reporting [NEMSIS v3.4 data](#). The NEMSIS v3.5 data dictionary is available [here](#).

What is an EMS activation?

An EMS activation refers to a single record in the EMS dataset – each EMS activation represents one EMS agency's encounter with one patient during their response to an incident. The EMS dataset is a registry of EMS activations - it is not a "patient-based" dataset. Because multiple EMS agencies can respond to the same incident and care for the same patient, or there could be multiple patients involved in the same incident, there can be more than one EMS activation (record) per patient or incident. One EMS record is not the same as one person or incident.

EMS activations can be grouped by response type (911/scene response, interfacility or medical transport, other) and patient disposition (transported, transferred care, patient refusal, canceled).

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Can there be more than one EMS record for the same patient?

Yes. Because multiple EMS agencies can respond to the same incident and care for the same patient, there can be more than one EMS activation (record) per patient/incident. One EMS record is not the same as one person. For example, a non-transporting unit responds first to a 911 call - then a ground ambulance shows up to transport the patient. Perhaps the ground ambulance meets a helicopter en route due to the patient's condition. There would be three records (EMS activations) representing this patient.

Why do EMS statistics about opioid overdoses change from time to time?

EMS numbers and statistics can change for a few reasons:

- Late submissions of patient care reports (PCRs) – In 2023, the 90th percentile submission latency was ~10 days, meaning that 10% of records took 10 days or more after the event date to be submitted.
- Updates made to existing PCRs
- Modifications of Montana's EMS suspected opioid overdose syndrome definition that is used to capture overdose events

While exact numbers may vary slightly, EMS data is an important tool for detecting trends or anomalies across the state in near real-time.

How are opioid overdoses identified using EMS data?

Epidemiologists analyze the EMS data and identify patient care reports (PCRs) that meet the definition of an opioid overdose. The current definition can be found here: Montana's EMS suspected opioid overdose syndrome definition. The definition includes components of searching structured variable fields (i.e. provider impression) as well as free-text analysis of the EMS narrative. Examples of what would qualify as a suspected opioid overdose include:

- Emergency care providers document a provider impression of opioid overdose
- Emergency care providers document that the patient was given naloxone (an opioid overdose reversal drug) and the patient's condition improved in response to it.

Can we use EMS data to track fentanyl overdoses?

No. EMS data is NOT the most effective source for identifying fentanyl overdoses. Because the signs/symptoms of a fentanyl overdose are similar to those of other opioids, it is often not possible for EMS providers to determine the specific type of opioid involved. If a specific opioid is mentioned in EMS documentation, this information is based on observation, patient self-report, or information from bystanders – rather than a definitive lab test, which are not performed in the pre-hospital setting. Because the presence of fentanyl requires laboratory testing, EMS data cannot be used to identify fentanyl overdoses.

Can we track opioid overdose reversals using EMS data?

We can track probable opioid overdose reversals. If a patient was given naloxone and their condition subsequently improved, this is a probable overdose reversal. Because Montana's EMS dataset is not linked to hospital outcome information, we cannot say for sure whether an opioid overdose was reversed successfully.

What are the benefits of using EMS data to track opioid overdoses?

In general, patient care reports (PCRs) are uploaded and made available in the reporting dataset within 24 hours of the event. (In 2023, about 50% of records had a latency time ≤ 12 hours, and about 70% of records had a latency time ≤24 hours. About 10% of records had a latency time of ten days or more). This near real-time data allows analysts to detect any trends or anomalies happening quickly across the state. In contrast, other data sources such as mortality (death) data or hospital discharge data can have a delay of 6 to 18 months after the event has occurred due to data verification and cleaning processes.

What are the limitations of using EMS data to track opioid overdoses?

- EMS providers assign an "impression." This is not the same as a "diagnosis" which is given in the hospital. Therefore, we refer to "suspected" opioid overdoses when using EMS data.
- EMS data is subject to data quality issues which can affect our ability to accurately capture opioid overdoses.
- EMS data does not capture overdoses where EMS did not make patient contact.
- EMS data does not capture most naloxone administrations by law enforcement or the public. For example, if a bystander gives naloxone and reverses an overdose and the patient refuses further care, this would not be captured within the EMS dataset.
- There may be some data quality issues due to the transition from NEMSIS 3.4 to NEMSIS 3.5.

ED Visit and Hospitalization Discharge Data

How are opioid overdoses identified in emergency department (ED) discharge data?

If there is any mention of an opioid overdose ICD-10-CM code in ED visit record, it is classified as an opioid overdose-related ED visit.

How are opioid overdoses identified in hospital discharge data?

If there is any mention of opioid overdose ICD-10-CM code in hospitalization record, it is classified as an opioid overdose-related hospitalization.

What is the difference between ED visit and hospitalization data?

Hospitalizations refer to patients who are admitted for inpatient care – which usually occurs for more serious cases. The exception being if the patient dies in the ED before inpatient admission could occur. ED visits that result in admission to the hospital are NOT included in the ED visit dataset – only in the hospitalization dataset.

Can we use ED visit and/or hospitalization data to track fentanyl overdoses?

Yes. A new ICD-10-CM code specific to fentanyl (T40.41) was introduced in October 2020 which allows us to definitively capture fentanyl involvement. However, there may be some underutilization of this code.

What are the benefits of using ED and hospital discharge data to track opioid overdoses?

As opposed to EMS data, ED and hospital discharge data include diagnosis codes (ICD codes) that are based on lab results and physician expertise. This provides a definitive answer to opioid involvement.

What are the limitations of using ED and hospital discharge data to track opioid overdoses?

- MHDDS data is provided courtesy of participating Montana Hospital Association (MHA) members and represents approximately 85% of annual hospital discharges in Montana. MHDDS does not include data from the U.S. Veterans Administration, Indian Health Service, or Montana State Hospital, and as a result may not be representative of all discharges in the state.
- Historically, ED and hospital discharge data for a full year were released all at once, usually six to seven months after the calendar year has finished. This is transitioning to quarterly data releases starting in 2024. The lag in data availability can prevent real-time tracking of overdoses.
- Naloxone administration is not captured in this dataset.
- ED and hospital discharge data does not include data from patients that died in the field.

ED Syndromic Surveillance Data (ESSENCE)

How are opioid overdoses identified in ED syndromic surveillance data (ESSENCE)?

Opioid overdose patients that arrive at Montana EDs are tracked using ESSENCE. ESSENCE (Electronic Surveillance System for the Early Notification of Community-based Epidemics) is a web-based syndromic surveillance system designed for the early detection of disease outbreaks, suspicious patterns of illness, and public health emergencies. ESSENCE collects, processes, and analyzes information from patient records (such as chief complaints and triage notes from ED visits) to identify anomalous disease activity in a community. These records are uploaded by participating hospitals every 24 hours, generally.

To standardize syndromic surveillance of overdoses nationwide, the CDC created pre-set syndrome definitions for any drug overdose, all opioid overdoses, heroin overdoses, and stimulant overdoses. These definitions can be queried by location and time to create a temporo-spatial understanding of overdose in Montana.

What is the difference between ED discharge data and ED syndromic surveillance data (ESSENCE)?

ED discharge data is a final, cleaned, and verified dataset that is made available to epidemiologists in one-year increments. ED syndromic data is updated every 24 hours but is subject to change as the patient's file is updated or edited to reflect changes in their care or diagnoses.

The ED discharge dataset is derived from billing data, while the ED syndromic surveillance data capture some narrative and other elements from the electronic health record that would not be available on the billing form – chief complaint, triage notes, initial temperature, initial pulse oximetry percent, height, weight, BP.

ESSENCE is not subject to the same exclusion criteria as ED discharge data (which excludes VA and IHS hospitals). Any hospital with an emergency and/or urgent care department and the ability to meet the current PHIN HL7 messaging requirements can submit syndromic surveillance data to ESSENCE. Currently, no Montana IHS facilities submit data to ESSENCE, and VA hospitals have only been submitting a limited dataset during the COVID pandemic.

What are the benefits of using ED syndromic surveillance (ESSENCE) data to track opioid overdoses?

About 86% of MT hospitals share data with ESSENCE, which captures approximately 96-99% of the ED visits that happen across the state. ESSENCE also has data on Montana residents who are seen in South Dakota EDs. Since these data are updated every 24 hours, it may be used to observe any trends as they are happening across the state.

With syndromic surveillance, both chief complaint and discharge diagnosis codes are used to identify opioid overdose ED visits. The chief complaint provides a level of detail not available from the diagnosis code descriptions alone.

What are the limitations of using ED syndromic surveillance data to track opioid overdoses?

- Not every hospital submits data to the ED syndromic surveillance dataset, which leaves some gaps in surveillance coverage.
- Hospital connectivity and submission issues can cause artificial fluctuations in the volume of overall and condition-specific ED visits over time

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- These data are also subject to change—laboratory results as well as final diagnoses are not always included in this dataset. Approximately 10-15% of ED visits have missing discharge diagnoses.
- There is substantial variability in the completeness and quality of the data by facility.
- The level of detail included in the chief complaint varies by facility.

ODMAP

What is ODMAP?

ODMAP stands for the Overdose Detection Mapping Application Program. ODMAP provides maps of geocoded naloxone administration and overdose events. Entries are automatically added from the state EMS data repository if the EMS record meets Montana's EMS suspected opioid overdose syndrome definition. Law enforcement can manually enter cases, and coroner data is also manually added for fatal overdoses. Hospital systems are also being onboarded to enter data in ODMAP for cases that may not have interacted with pre-hospital responders (EMS or law enforcement). Maps allow for the addition of multiple layers to provide further context (for example, layers that show naloxone distribution).

The system also allows for spike alerts, with communications sent to specified users if the number of overdoses in a defined geographic region exceeds a specified threshold in a 24 hour period.

Authorized users can request an account through DPHHS using this form.

Can we use ODMAP data to track fentanyl overdoses?

No. ODMAP data mainly comes from EMS and law enforcement. Because the signs/symptoms of a fentanyl overdose are similar to those of other opioids, it is often not possible for pre-hospital responders to determine the specific type of opioid involved. If a specific opioid is mentioned, this information is based on observation, patient self-report, or information from bystanders – rather than a definitive lab test, which are not performed in the pre-hospital setting. Because the presence of fentanyl requires laboratory testing, ODMAP data cannot be used to identify fentanyl overdoses.

What are the benefits of using ODMAP data to track opioid overdoses?

- Near real-time availability of data
- Provides precise location information
- Captures a wider net of overdoses than any other single data source, because of law enforcement, coroner, and hospital system participation
- Able to upload map layers of interest
- Facilitates coordination and communication between public safety and public health

What are the limitations of using ODMAP data to track opioid overdoses?

- Data may include duplicates, accidental prescription overdoses, and false positives (not actually an overdose). Users should confirm data with other sources as possible.
- Does not currently include overdoses that do not get reported by EMS, law enforcement, or hospital systems.
- Spike alerts can only count overdoses that occur within 24 hours and cannot be extended to a longer timeframe.

Mortality (Death Certificate) Data

How are opioid overdoses identified in mortality (death) data?

Mortality data is pulled from death certificates, which include information on the underlying and contributing causes of death. If there is any mention of an opioid overdose ICD-10 code on the death certificate, it is classified as an opioid overdose.

Can we use death data to track fentanyl overdoses?

To an extent, yes. Death certificates use ICD-10 codes when reporting causes of death. Unfortunately, unlike ICD-10-CM codes used in ED and hospital discharge records, there is no specific ICD-10 code for fentanyl as a cause of death at this time. The closest existing ICD-10 code is "T40.4- Other Synthetic Narcotics", which is not specific to fentanyl (it can include fentanyl & fentanyl analogs, pethidine, levorphanol, tramadol, and dextropropoxyphene).

However, death certificates contain a free text field where coroners or medical examiners may add extra information outside of the ICD code fields. In the event of overdoses, coroners and medical examiners may write out the exact substances identified in a toxicology screen conducted during an autopsy. If the word "fentanyl" is written in a free text field, we can positively identify the death as fentanyl-related.

Limitations for using this data source to capture fentanyl overdose include:

- Not every overdose death receives an autopsy and post-mortem toxicologic screen that can definitively identify the presence of fentanyl (in 2022, around 7% of deaths in Montana receive an autopsy according to the 2023 Medical Examiners annual report)
- Even if fentanyl is known to be involved, some coroners or medical examiners fail to document this in the free text fields of the death certificate

What are the benefits of using death data to track opioid overdoses?

All deaths are required to have a death certificate which must include a cause of death. This means that death certificate data is representative of the Montana population.

What are the limitations of using death data to track opioid overdoses?

- Mortality data for a full year are released all at once, usually six to seven months after the calendar year has finished. This does not allow for real-time tracking of overdoses.
- There are inconsistencies with coroner's and medical examiner's methodology in completing death certificate data.
- Naloxone administration or any other lifesaving measures attempted prior to the death is not captured in this dataset.
- Not every overdose death receives an autopsy or has toxicologic testing, which means the specific substance(s) involved in a death may not be definitively known.

Crime Lab Data

What kind of data on opioids is available from the state crime lab (Forensic Science division)?

Autopsy data, postmortem toxicology data, and seized drug data. Autopsy data and postmortem toxicology data both pertain to deaths, and seized drug data refers to drugs found/taken by law enforcement during an incident.

What is the difference between autopsy data and post-mortem toxicology data?

Autopsy data comes from the Medical Examiner's Office and postmortem toxicology data comes from the Toxicology Section.

Autopsies tell us about the causes of death. Post-mortem toxicology tells us what (if any) substances were present in a dead body but does not tell us whether those substances were related to the cause of death.

What are the benefits of using autopsy data to track opioid overdoses?

Most autopsies will involve a postmortem toxicology analysis. Significant toxicology results on autopsied cases can confirm the role of opioids, including fentanyl, in drug overdose deaths.

Autopsied cases are typically finalized in less than 90 days.

What are the limitations of using autopsy data to track opioid overdoses?

Autopsies are only done on around 7% of all deaths in Montana. Generally, the need for an autopsy is determined by the county coroner per Title 46, Chapter 4, Part 1 of Montana Code Annotated. At the discretion of county coroners, selected suicides, overdoses, traffic fatalities, and well-established natural deaths are not submitted for autopsy. Therefore, autopsy data can be used for looking at trends in opioid overdoses but is not representative of the entire state.

Can postmortem toxicology data be used to track opioid overdoses?

Yes, but is important to recognize that the presence of a drug in a postmortem tox case does NOT necessarily mean that it was part of the cause of death. Therefore, this data source is not representative of opioid overdose deaths.

Post-mortem toxicology testing is done during most autopsies in Montana, and occasionally for deaths where no autopsy is requested. Toxicology results provide a detailed picture of which substances were present in the decedent, distinguishing between acute single drug or poly-drug combinations.

SUDORS Data

What is SUDORS data?

SUDORS stands for State Unintentional Drug Overdose Reporting System and is intended to help people better understand the circumstances surrounding unintentional drug overdose deaths. The SUDORS program collects data from death certificates and coroner/medical examiner reports, which include a variety of documents including autopsy reports, toxicology reports, and occasionally investigation summaries and scene descriptions. More about SUDORS can be found on the [CDC website](#).

Can we use SUDORS data to track fentanyl overdoses?

Yes. SUDORS data has similar limitations to death certificate, autopsy, and postmortem toxicology data, although some of these limitations may be overcome through combining information from each of these three sources.

What are the benefits of using SUDORS data to track opioid overdoses?

Because SUDORS data includes information from multiple sources, it provides comprehensive details about drug overdose deaths and can overcome some of the limitations of using a single data source on its own. SUDORS data can include information on the drugs that caused death, additional drugs detected, and additional context around the overdose (if bystanders were present, if naloxone was administered, if the decedent had a history of substance use disorder, etc. The potential richness of this data can lend itself to multiple types of analysis.

After DPHHS submits SUDORS data, the CDC conducts extensive data cleaning and quality checks and sends a final dataset back to DPHHS about six months to one year after data is submitted.

What are the limitations of using SUDORS data to track opioid overdoses?

Data completeness is dependent on information documented at the time of death and therefore leads to potentially large amounts of missing data. DPHHS receives data from a variety of law enforcement agencies that do not always provide complete information; most agencies are concerned primarily with the cause and manner of death, and not the circumstances around it. This means that many reports do not contain past drug use or overdose history, bystander information, or if the decedent had received any treatment for prior substance use disorders. DPHHS is working with counties to improve the level of detail available in reports.

Addressing emerging drugs

Public health and public safety professionals should be aware of new drugs entering the US drug supply such as xylazine, and more recently, medetomidine. These drugs are often mixed with other drugs and people overdosing on these drugs may not respond to naloxone, increasing the risk of death. Currently, the data available to monitor emerging dugs is limited and dependent upon whether testing is available for specific drugs. The following are data sources that are currently used to monitor the presence of xylazine in the Montana:

- **Crime Lab data:** Testing on drugs seized by law enforcement during an incident
- **SUDORS data:** If xylazine is detected during postmortem toxicology, it will be indicated in the SUDORS dataset
- **Drug test data** (not included in this FAQ): Millennium Health provides drug testing services to clinicians and substance abuse treatment providers in Montana and shares summary data with the state. This data is highly correlated with drug overdose data, and they currently test for xylazine.
- **Wastewater data** (not included in this FAQ): Biobot Analytics tests wastewater in Bozeman and Missoula for various substances, including xylazine.

Hospital data and EMS data will both be limited and unreliable for monitoring emerging drugs, as there are no ICD-10-CM codes for these specific drugs. This section will be updated as new drugs of concern arise or data availability changes.

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