

Nevada Syndromic Surveillance Alert and Investigation Plan

Purpose: The purpose of this investigation plan is to monitor the overdose risk in each behavioral health region in Nevada using Syndromic Surveillance. Syndromic Surveillance provides public health officials with a timely system for detecting, understanding, and monitoring health events. By tracking symptoms of patients in emergency departments (ED) before a diagnosis is confirmed, public health can detect unusual levels of illness to determine whether a response is warranted. Syndromic data can serve as an early warning system for public health concerns to respond to drug-related overdose.

Counties around the state have begun creating overdose spike response plans utilizing the Overdose Detection Mapping Application (ODMAP) as their main surveillance tool where first responders log overdose events in their communities. Although it can be a useful tool, its use in Nevada is relatively new and although multiple agencies are set-up in the system, not all of them log their data in a timely manner, leading some overdose spikes to go unnoticed until it is too late. This alert system is meant as a means to fill in the gap using ED encounter data as an additional tool to monitor overdose morbidity on a larger scale state-wide and by behavioral health region. **The following plan outlines what would constitute an alert in Syndromic Surveillance, as well as the steps Nevada Overdose Data to Action (OD2A) staff will play in investigating and validating the alert, before spike response planning teams are notified and respond.**

Figure 1: High-level overview of alert, investigation, and response protocol

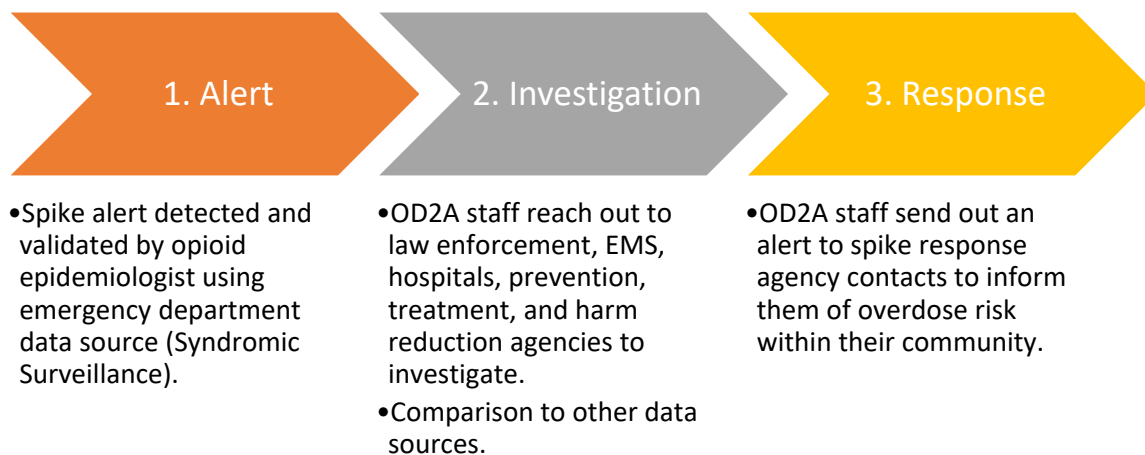


Figure 2. Breakdown of Alert Phase

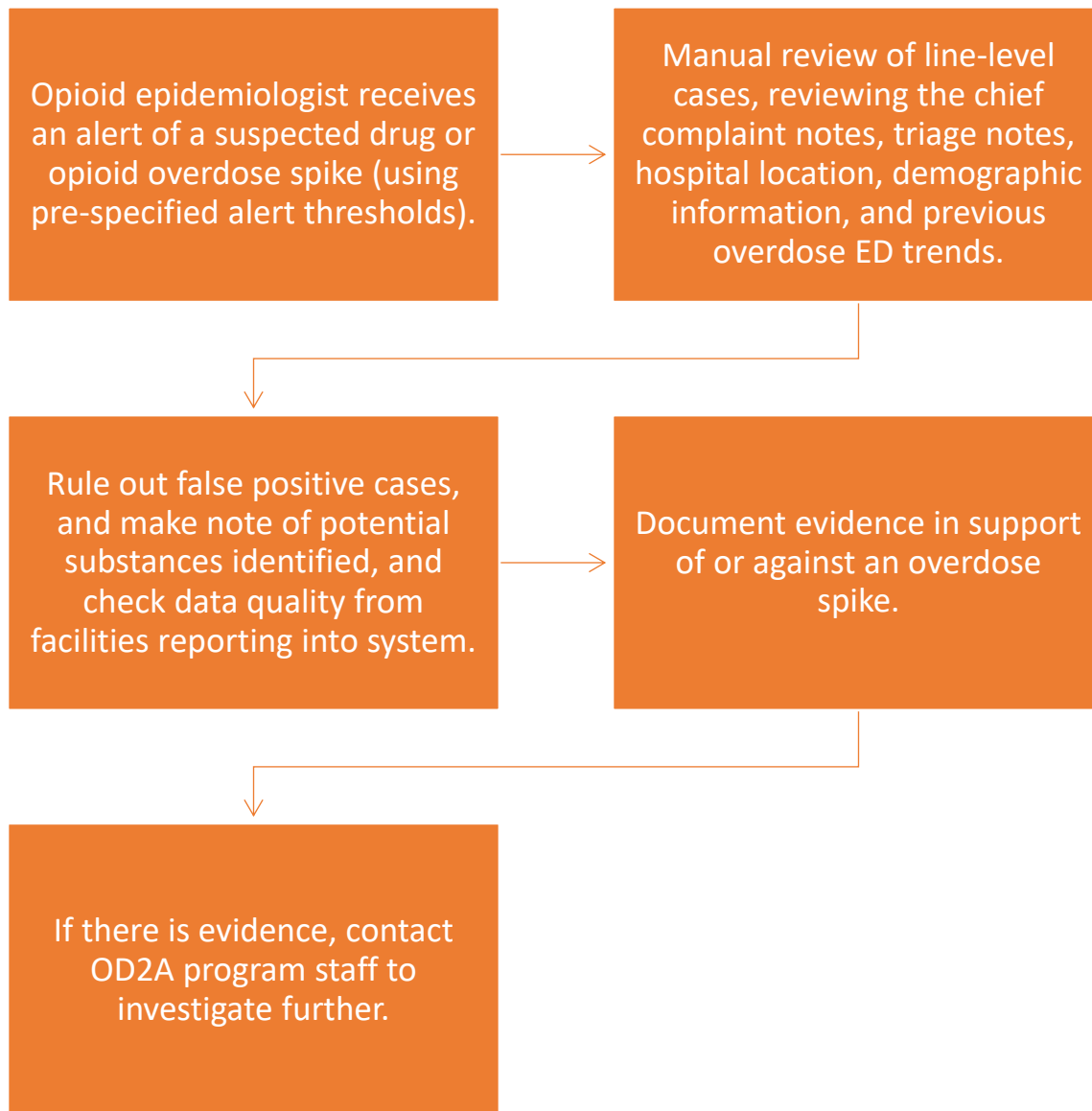
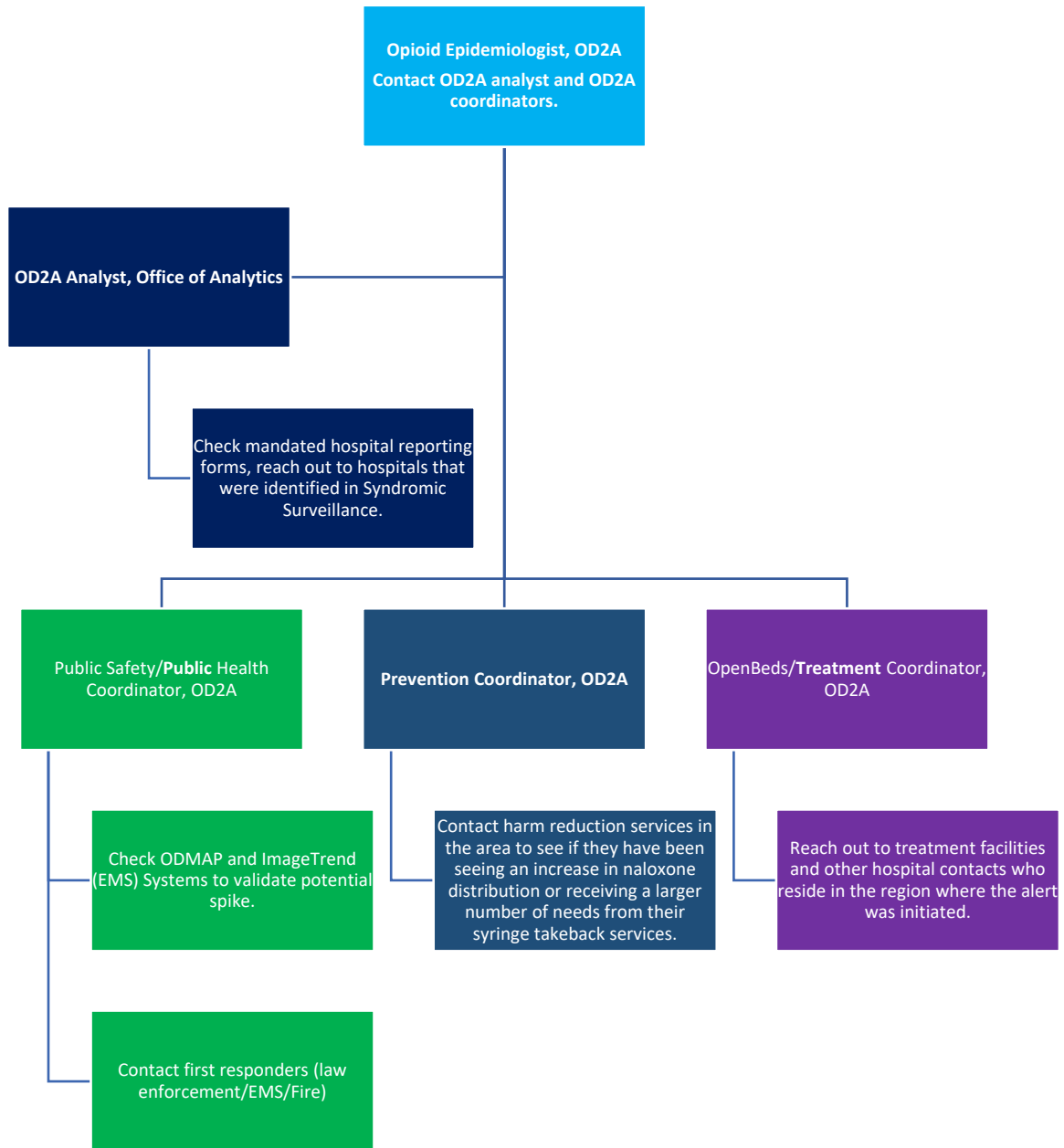


Figure 3. Breakdown of Investigation Phase



Regions and counties for the alert system:

1. Washoe Regional Behavioral Health Region: Washoe
2. Clark Regional Behavioral Health Region: Clark
3. Northern Regional Behavioral Health Region: Carson City, Storey, Douglas, Lyon, Churchill
4. Southern Regional Behavioral Health Region: Mineral, Esmeralda, Nye, Lincoln
5. Rural Regional Behavioral Health Region: Humboldt, Pershing, Lander, Eureka, Elko, White Pine

Section 1: Alert Phase

1A) Alert

The opioid epidemiologist will monitor Syndromic Surveillance daily for substance use-related emergency department encounters daily, using CDC case definitions for suspected drug-related and opioid-related emergency department visits (See Section 1.1 below). The system allows the user to set-up an alert using predefined criteria to identify overdose clusters. If an alert is generated in response to a spike or cluster of suspected drug-related or overdose-related ED visits, the opioid epidemiologist will manually review cases that triggered the alert and review data quality in the system over time to learn more about the alert generated.

2A) Manual Review:

The opioid epidemiologist will manual review the cases that led to the alerts to rule out any potential false positives (picked up as an overdose, but instead is cardiovascular/respiratory-related and no substances are involved). In addition, they will review the chief complaint text and triage notes to better understand the substances that may be involved in the visit. If a significant number of visits are for a particular substance, there may be reason to suspect a possible overdose spike in the community. If there is reason to suspect a possible overdose spike in the community, the investigation phase will be triggered. An email will be sent to the public safety/health coordinator, prevention coordinator, treatment coordinator, and Overdose Data to Action analyst, who will investigate further.

Section 1.1: Alert Threshold

To create the thresholds, 2019 Syndromic Surveillance data for drug-related and opioid-related ED visits were used. For each behavioral health region and statewide, a static annual daily

average for each type of visit was calculated. These standards were observed for several months to determine how they performed. Based on discussion with other states on national workgroup meetings, only a small handful of states are currently using this system to alert them to spikes of overdoses within their communities. So far, a best practice of using two or three standard deviations above the mean has proved successful in detecting overdose spikes, while reducing alert fatigue. Based on future performance, the thresholds identified may be updated.

Suspected drug overdose spikes and cluster

- Suspected drug overdose spike: a one-day threshold that is three standard deviations above the mean.
- Suspected drug overdose cluster: three days during a two-week period where the number of suspected overdoses is two standard deviations above the mean.

How this case definition was created

- First, discharge diagnosis codes and SNOMED indicating an acute drug poisoning were identified. Next, we identified “overdose terms”. Finally, we identified “drug terms” indicating that any type of drug was involved in the overdose. The definition was developed to be inclusive of all drug types, not specifically those that may be illicit versus prescription. We used both the discharge diagnosis codes/SNOMED and chief complaint free text with exclusions (as necessary). If discharge diagnosis code/SNOMED indicating a drug poisoning is present, the ED visit is automatically included in the syndrome. If there is no discharge diagnosis code/SNOMED present for drug poisoning, the visit is only included if the chief complaint text has both an “overdose” and “drug” term. In addition, the list of exclusions is only applied to the chief complaint text when a discharge diagnosis code is not present.

Table 1. Chief complaint and discharge diagnosis search terms		
Variable	Automatic Inclusion?	Specific Terms
<i>Inclusions</i>		
Discharge Diagnosis – ICD-9-CM poisoning	Yes	960-979; E850-E858; and E980.0-E980.5
Discharge Diagnosis – ICD-10-CM poisoning	Yes	T36-T50 (only 1 and 4 for intent and A for first encounter; no underdosing or adverse effect) For T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9, a 5th character; for all others, a 6 th character

Discharge Diagnosis – ICD-10-CM opioid abuse/dependence/use with intoxication	Yes	F11.12, F11.120, F11.121, F11.122, F11.129, F11.22, F11.220, F11.221, F11.222, F11.229, F11.92, F11.920, F11.921, F11.922, F11.929 (also included terms with no period, e.g., “F1112”)
Discharge Diagnosis – SNOMED	Yes	295121001, 295597003, 295487009, 295334008, 295313001, 295593004, 295799003, 295117008, 295495008, 295332007, 295808006, 295123003, 295587007, 295314007, 295134000, 295910009, 296295001, 296412004, 296529003, 296334003, 296921006, 296513006, 296389000, 296845006, 296499009, 296922004, 296825003, 296943003, 296896008, 296853003, 296974001, 296450005, 296478006, 296402006, 296970005, 296509004, 296503003, 296425007, 296811004, 296948007, 297006008, 297094003, 297065005
Chief complaint – narcan or naloxone	Yes	Naloxone (narcan, evzio)
Chief complaint – overdose term	Yes	Overdose (overdose, overdoes, averdose, averdoes, over does, overose)
Chief complaint – overdose term	No, must use in combination with overdose term	Poisoning (poison) Nodding off Snort Ingestion (ingest, inject) Intoxication (intoxic) Unresponsive (unresponsiv) Loss of consciousness (syncopy, syncope) Shortness of breath (SOB), short of breath Altered mental status (AMS)
Chief complaint – drug term	No, must use in combination with overdose term	Drug, pill, poly drug/substance Stimulants – Cocaine, Amphetamine, Methamphetamine... Benzodiazepines – Alprazolam, Clonazepam, Diazepam, Lorazepam, Xanax.... Hallucinogens - Phencyclidine (PCP), MDMA, Ecstasy, Lysergic acid diethylamide (LSD)... Opioids – Buprenorphine, Codeine, Fentanyl, Heroin, Hydrocodone, Hydromorphone, Methadone, Morphine,

		Oxycodone, Oxymorphone, kratom, loperamide... Marijuana, cannabinoids and synthetic cannabinoids... Cathinones or bath salts...Ketamine...Gabapentin...Gamma hydroxybutyrate (GHB)...Sleep sedatives *(all brand names/slang included)
Discharge Diagnosis – ICD-10-CM opioid abuse/dependence/use	No, must use in combination with overdose term	F11.10, F11.90, F11.20
<i>Exclusions</i>		
Chief complaint	Exclude	Built into code to exclude other conditions that may not be suspected overdose (i.e. excluding shortness of breath when no substance used).

Suspected opioid overdose spikes and cluster

- Suspected opioid overdose spike: a one-day threshold that is three standard deviations above the mean.
- Suspected opioid overdose cluster: three days during a two-week period where the number of suspected overdoses is two standard deviations above the mean.

How this case definition was created:

- First, discharge diagnosis codes and SNOMED indicating an acute opioid poisoning were identified. Next, we identified “overdose terms”. Finally, we identified “opioid drug” term indicating that an opioid was involved in the overdose. We use both the discharge diagnosis codes/SNOMED and chief complaint free text with exclusions (as necessary). If discharge diagnosis code/SNOMED indicating an opioid poisoning is present, the ED visit is automatically included in the syndrome. If there is no discharge diagnosis code/SNOMED present for opioid poisoning, the visit is only included if the chief complaint text has both an “overdose” and “opioid drug” term. In addition, the list of exclusions is only applied to the chief complaint text when a discharge diagnosis code is not present.

Table 2. Chief complaint and discharge diagnosis search terms

Variable	Automatic Inclusion?	Specific Terms
<i>Inclusions</i>		
Discharge Diagnosis – ICD-9-CM poisoning	Yes	965.01, E850.0 (also included terms with no period, e.g., “96501”)
Discharge Diagnosis – ICD-10-CM poisoning	Yes	T40.1X1A, T40.1X4A (also included terms with no period, e.g., “T401X1A”)
Discharge Diagnosis – SNOMED	Yes	295174006, 295175007, 295176008
Chief complaint – overdose term	No, must use in combination with heroin term	Poisoning (poison) Overdose (overdose, overdoes, averdose, averdoes, over does, overose) Nodding off Snort Ingestion (ingest, inject) Intoxication (intoxic) Unresponsive (unresponsiv) Loss of consciousness (syncope, syncope) Shortness of breath (SOB), short of breath Altered mental status (AMS)
Chief complaint – heroin term	No, must use in combination with overdose term	Heroin, herion, heroine, HOD, speedball, dope
<i>Exclusions</i>		
Chief complaint	Exclude	Built into code to exclude other conditions that may not be suspected overdose (i.e. excluding shortness of breath when no substance used).

Table 3. Counts that would generate an overdose spike or cluster in each region for investigation				
Region	Drug Overdose Alert Threshold		Opioid Overdose Alert Threshold	
	Spike	Cluster	Spike	Cluster
Statewide	40	35	15	13
Washoe	11	9	6	5
Clark	32	27	13	11
Northern	5	4	4	3
Southern	4	3	4	3

Rural	4	3	4	3
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Section 2: Investigation Phase

The Nevada Overdose Data to Action team will conduct a multi-pronged investigation, contacting hospitals, EMS, law enforcement, treatment providers, and harm reduction services, to cross reference other data sources or to receive anecdotal information that may be used to inform a response and alert local opioid spike response agencies.

- The opioid epidemiologist will check-in with the OD2A analyst within the Office of Analytics regarding the hospital-mandated reporting overdoses (441A reporting), to observe if there has been an increase in reporting from any of the hospitals. If hospital(s) within the region of the alert have seen such increases, follow-up to learn more may be necessary.
- The public safety/public health coordinator will check the Overdose Detection Mapping Application Program (ODMAP) and Emergency Medical Systems (EMS) platform ImageTrend to observe if there are any increases in overdoses being entered into the system. In addition, they will contact local law enforcement to see if they have been seeing an increase in calls related to drugs, increase in seized drugs, or other anecdotal information that would prove useful in understanding the situation.
- The prevention coordinator will contact harm reduction services in regions that may be seeing an overdose spike and ask if they have been seeing an increase in naloxone distribution or receiving a large number of needles from their syringe takeback services.
- The treatment coordinator will check the OpenBeds system, as well as reach out to their hospital contacts who reside in the region where the alert was initiated.

If there is evidence for an increase in overdoses, the opioid epidemiologist will notify the program manager and the overdose data to action team will begin the response phase.

Section 3: Response Phase

The program manager, working with the opioid epidemiologist, OD2A analyst, public safety/public health coordinator, and prevention coordinator, will send out an alert to overdose spike response planning contacts in the region where the alert was generated. These contacts will then evaluate their community's risk, and initiate their overdose spike response plan if needed.

The public safety/public health coordinator will make sure EMS and other public safety agencies are stocked with naloxone. The prevention coordinator will contact coalitions and harm reduction agencies to make sure naloxone is distributed to areas that are at-risk. The treatment

coordinator will contact hospital contacts regarding the situation, and provide education or resources if needed.

Section 4: After Response

After the response, the following may occur:

- Opioid epidemiologist and OD2A analyst will revise the alert definition for future use if necessary.
- Surveys will be sent out and follow-up interviews conducted among those involved in any part of the process to improve upon the overdose response.
- A short report will be put together by OD2A staff, to be sent to overdose spike response planning contacts or those who may have been involved in a response. The report will include, at a minimum, the reason for the alert, the investigation findings, notes from the response phase, and results from after response surveys and interviews.

Questions for Community Agencies:

A) Questions for EMS/Law Enforcement

1. Have you been seeing an increase in overdose calls/transportations in the past 7 days? If so, what are you seeing?
2. Have you been seeing overdoses clustering in a particular area?

B) Questions for Harm Reduction Services

1. Have you been seeing an increase or decrease in uptake of Naloxone?
2. Have you been distributing or collecting more syringes lately?

C) Questions for Hospitals (contacts for 441a contacts)

1. Have you been seeing an increase in overdose-related encounters? If so, what have you been seeing?
2. Have people reported more ingesting, smoking, sniffing, or injecting substances?