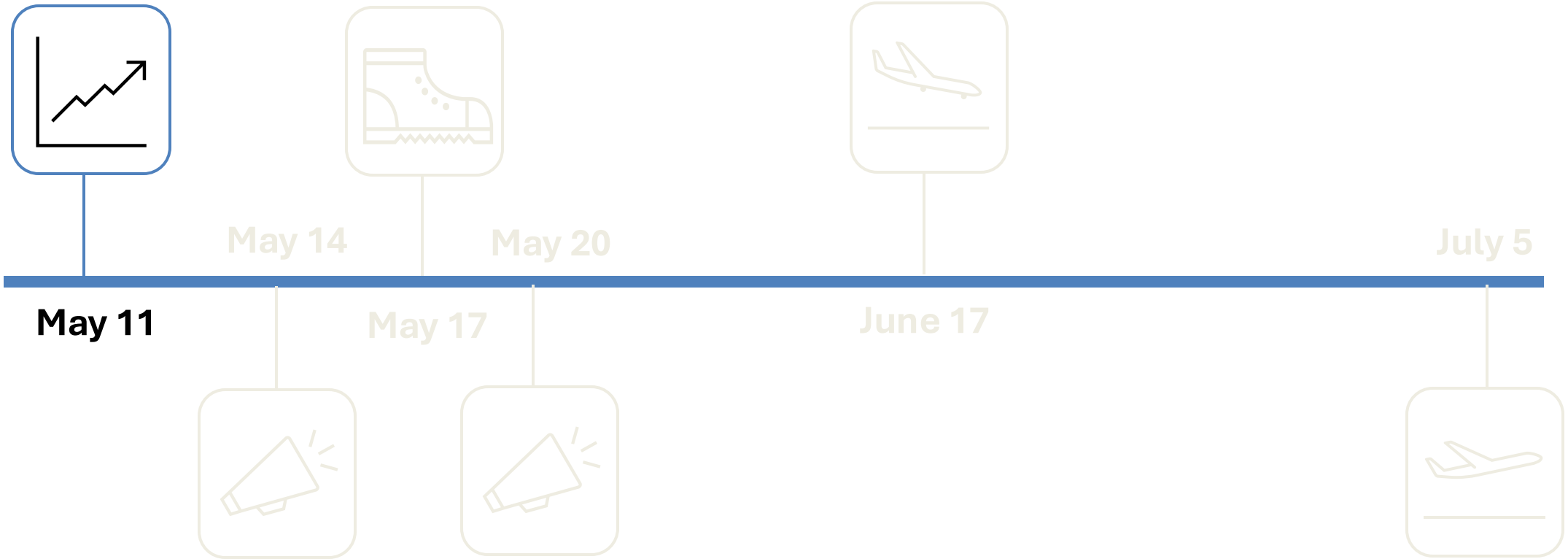
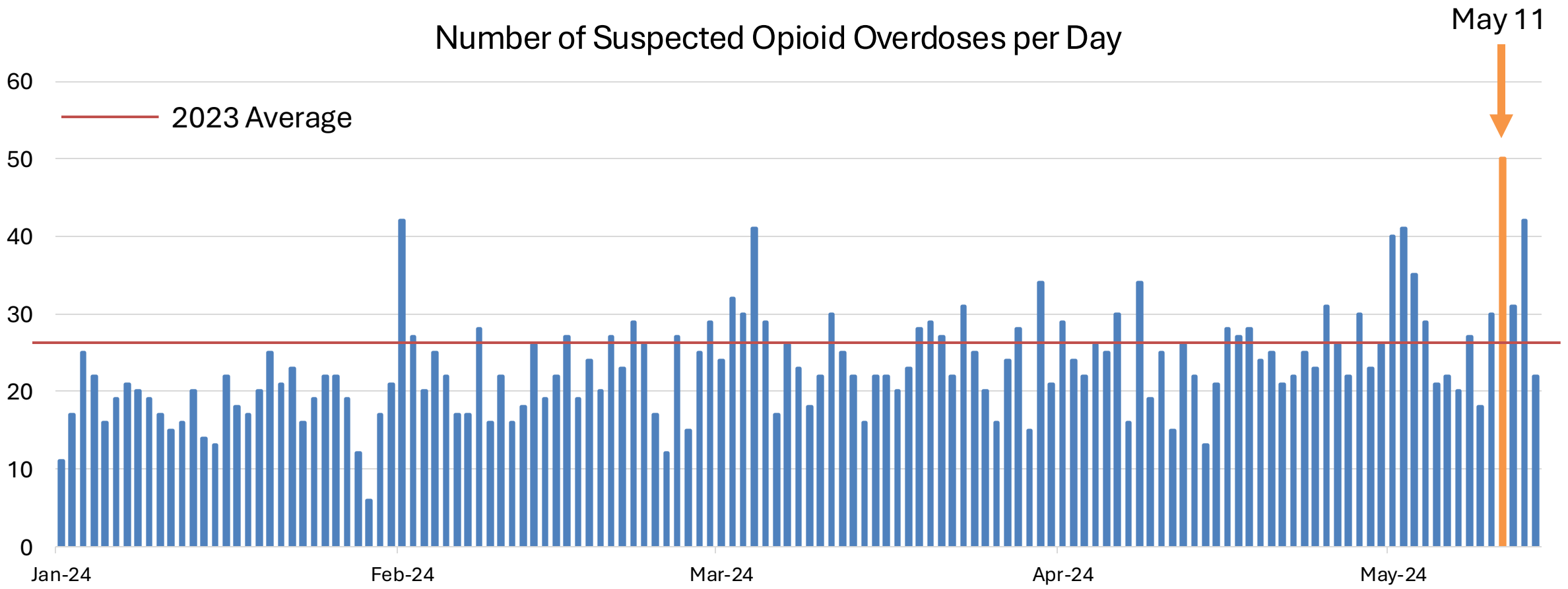
CDPH
Chicago Department of Public Health

Outbreak of Overdoses Involving Medetomidine Mixed With Opioids — Chicago, Illinois, May 2024

Amy Nham, PharmD, MPH
CDC Epidemic Intelligence Service (EIS) Officer
Chicago Department of Public Health
CDPH Disease Control Conference
September 10, 2024


May 11
May 14
May 17
May 20
June 17
July 5

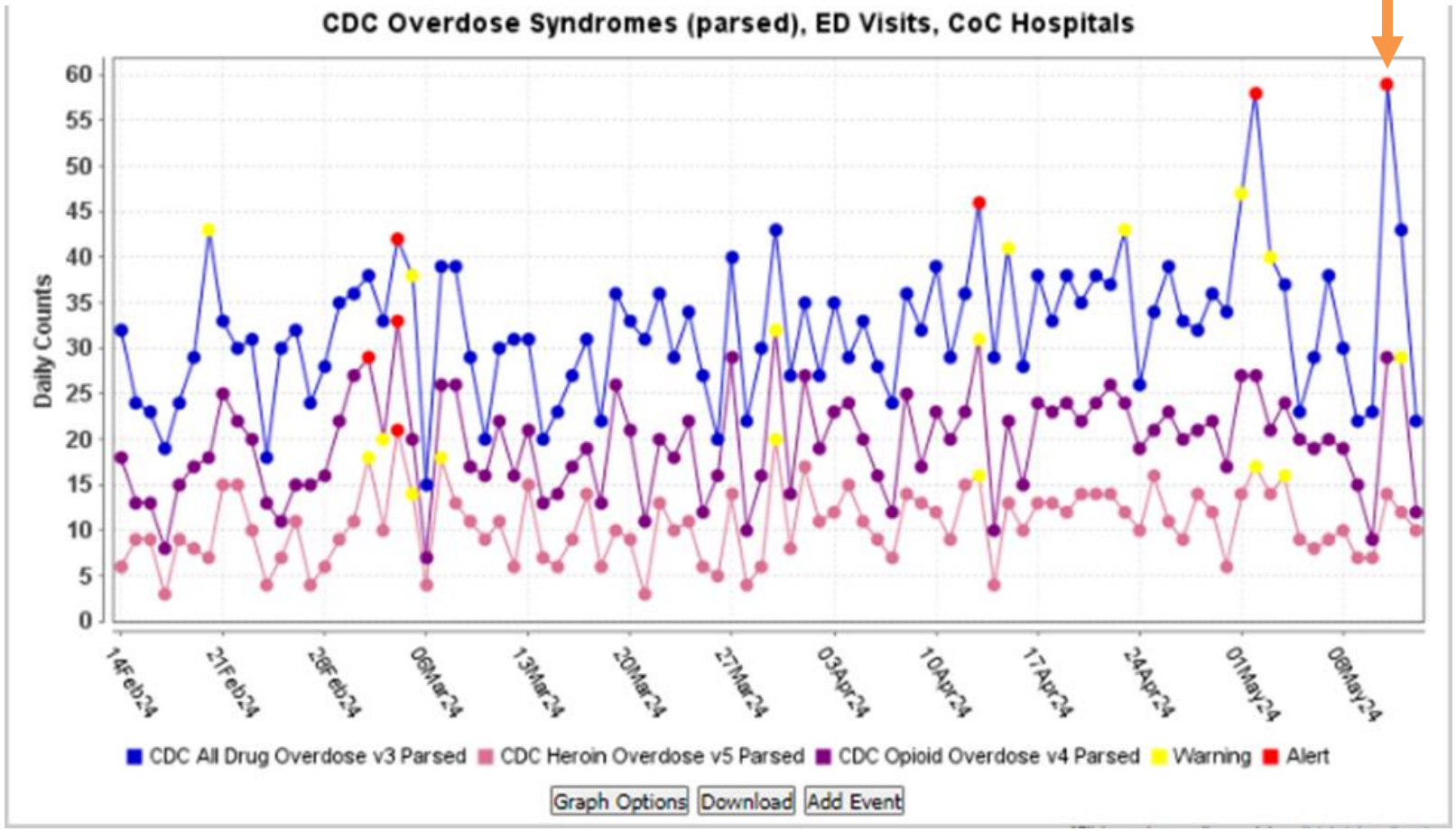
On May 11, ODMAP detected an increase in opioid overdoses in Chicago.

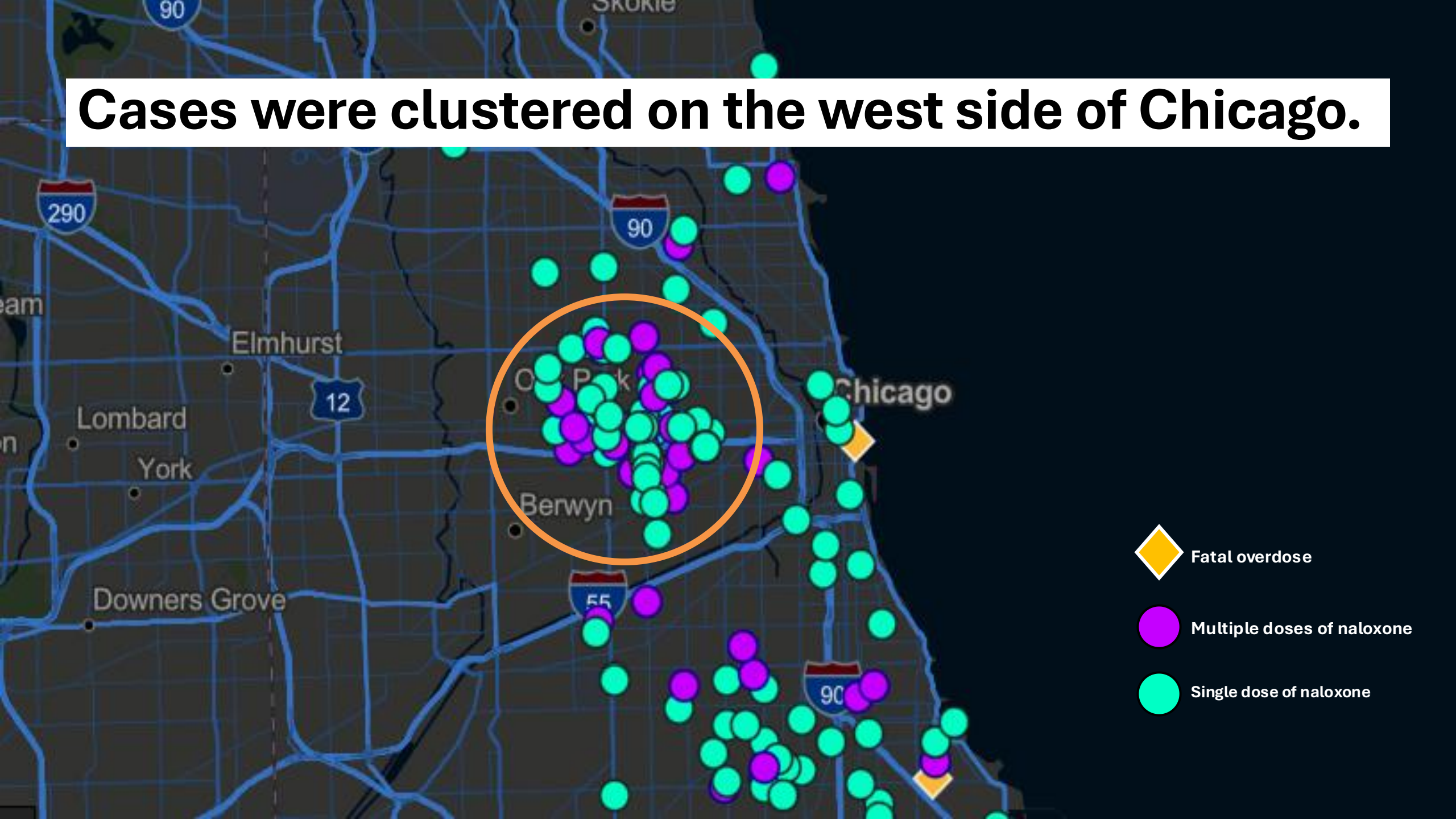


Data source: ODMAP

ESSENCE also detected an increase in overdoses.

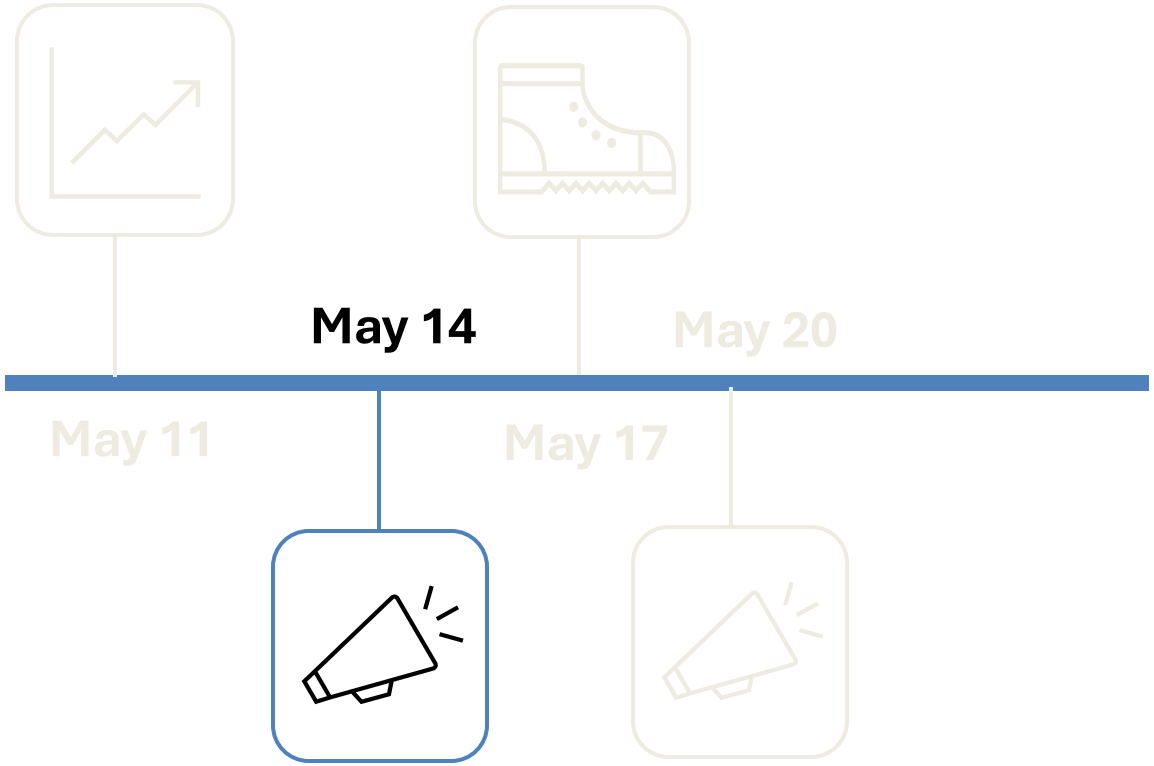
May 11




Cases were clustered on the west side of Chicago.
90
Skokie
290
90
Elmhurst
12
Lombard
York
Berwyn
Chicago
Downers Grove
55
90
Fatal overdose
Multiple doses of naloxone
Single dose of naloxone

There was a unique toxidrome.

- Opioid overdose symptoms
- Prolonged altered mental status, despite naloxone
- Bradycardia, hypertension, downward gaze



Chicago Department of Public Health

Health Alert

CDPH
Chicago Department of Public Health

City of Chicago
Brandon Johnson, Mayor

www.chicagohan.org

Chicago Department of Public Health
Olusimbo Ige, MD, MS, MPH, Commissioner

Increase in Opioid Overdoses

May 14, 2024

Summary and Action Items

- An increased number of opioid overdoses occurred in the Chicago area beginning Saturday, May 11, 2024, and remained elevated on Monday, May 13, 2024.
- In addition to presenting with symptoms of opioid toxicity (respiratory depression and pinpoint pupils), some patients also presented with hypertension, bradycardia and downward gaze.
- Providers should increase the amount of naloxone available on hand and distribute widely.
- Counsel patients and clients that *any* drug could contain fentanyl.
- The use of fentanyl and xylazine test strips on drug samples prior to consumption may help minimize the risk of overdose.
- Consider immediate initiation of buprenorphine for persons whose opioid overdose was reversed with Naloxone. MAR NOW is Illinois' immediate opioid treatment helpline. Call 833-234-6343 or text "HELP" to 833234.
- Visit overcomeopioids.org and chicagohan.org/opioid for more information.

Increase in Opioid Overdoses

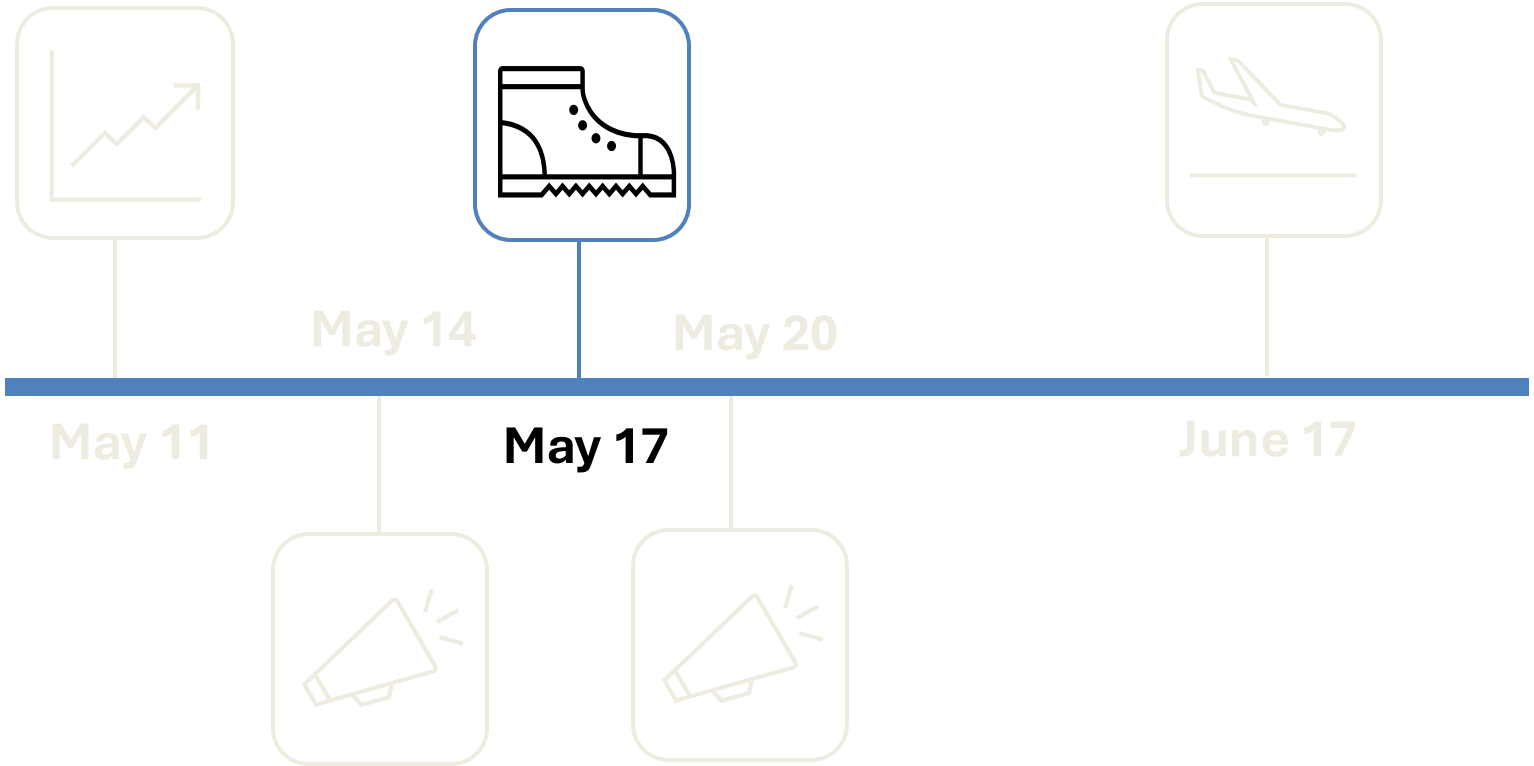
The Chicago Department of Public Health (CDPH) received confirmation from the Overdose Detection Mapping Application Program (ODMAP) that an increased number of opioid overdoses occurred in the Chicago area on Saturday, May 11, 2024, and remained elevated on Monday, May 13, 2024. The largest numbers of overdoses occurred in West Garfield Park, East Garfield Park, Austin, Humboldt Park, North Lawndale. CDPH is working to determine the specific substances associated with this increase in overdoses.

Clinical Relevance

Opioids are a class of drugs that include illicit substances like fentanyl or heroin as well as prescription pain medications including oxycodone and morphine. Overdoses can occur from taking a regular dose after tolerance has lowered, taking a stronger dose than the body is accustomed to, or combining opioids with other substances such as benzodiazepines. Fentanyl and synthetic opioids are extremely potent and have an increasing presence in the illicit opioid and stimulant drug supply in the Chicago area. Naloxone is a medication that acts as an opioid antagonist and is designed to rapidly reverse an opioid overdose. Given the possibility of adulteration with synthetic opioids, people who use other drugs such as cocaine, should also carry naloxone.

Actions to Take

- Increase the amount of naloxone and fentanyl and xylazine test strips available on hand and distribute widely to anyone at risk for an overdose.
- Counsel patients and clients that *any* drug could contain fentanyl.
- Healthcare providers should test specifically for fentanyl in patients presenting with symptoms of opioid overdose, because synthetic opioids, such as fentanyl, are not detected with routine toxicology testing.
- Consider immediate initiation of buprenorphine for persons whose opioid overdose was reversed with Naloxone. MAR NOW is Illinois' immediate opioid treatment helpline. Call 833-234-6343 or text "HELP" to 833234.


May 11
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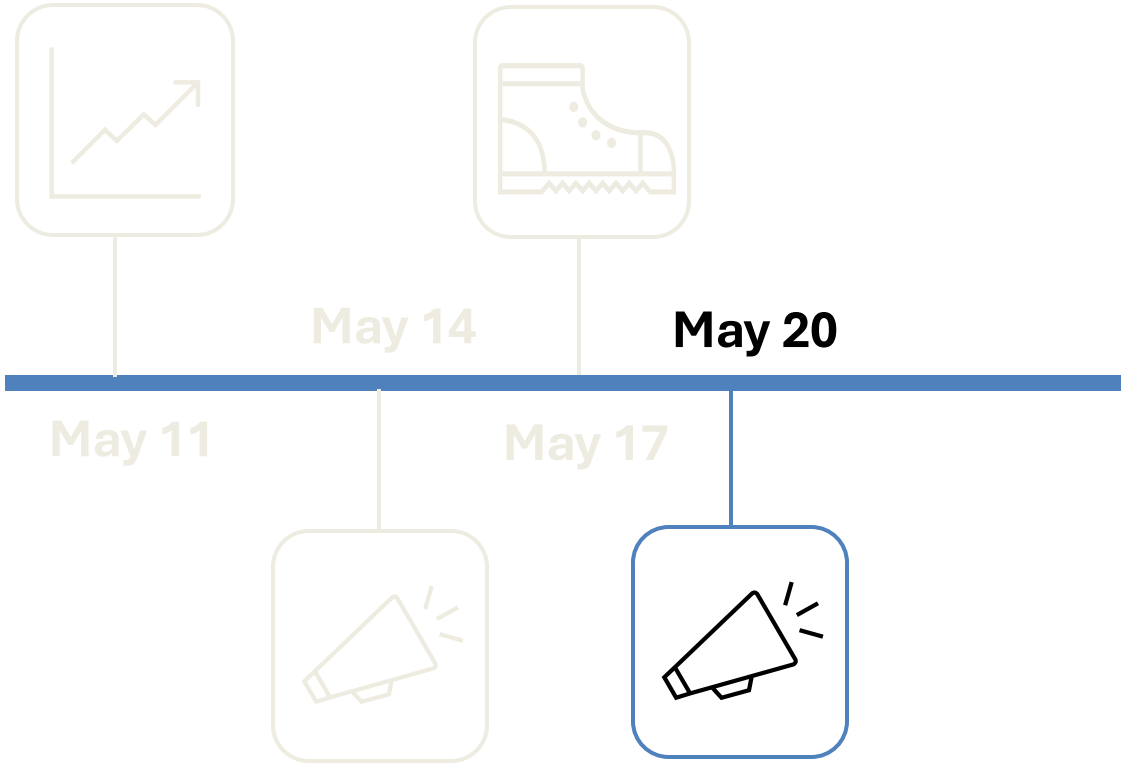

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Medetomidine in Chicago's Drug Supply

May 20, 2024

Summary and Action Items

- Multiple drug samples collected from the West Side of Chicago on May 11, 2024 tested positive for elevated levels of medetomidine. In addition, fentanyl, heroin, xylazine, alprazolam and nitazenes have been detected in the same samples.
- Medetomidine is a new adulterant in Chicago's drug supply. It is a non-opioid sedative like xylazine but considered more potent. It has no approved use in humans.
- Like its dextro-isomer dexmedetomidine (sold as Precedex® or Dexdor®), medetomidine acts on alpha-2-adrenergic receptors to cause sedation, analgesia, bradycardia, prolonged hypotension following initial hypertension, and peripheral vasoconstriction. It can also cause respiratory depression, which can be greater when taken with other opioid and non-opioid sedatives.
- Report overdoses with atypical features to the Illinois Poison Center – 1-800-222-1222 to send specimen for testing.
- Initiate all patients whose overdose was reversed with naloxone on medication for opioid use disorder (MOUD) before discharge from ED or hospital. MAR NOW is Illinois' immediate opioid treatment helpline. Call 833-234-6343 or text "HELP" to 833234.

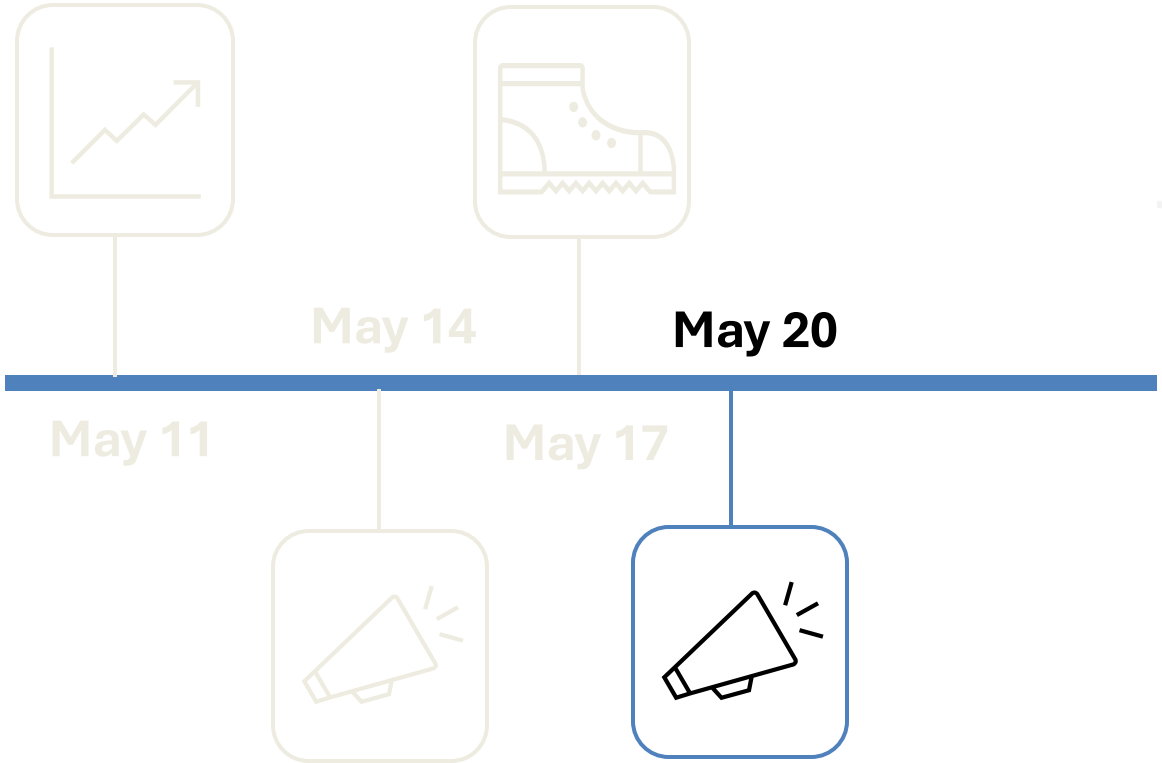
Medetomidine Detected in Chicago

During May 11-14, 2024 there was an increase in drug overdoses in Chicago. Multiple associated drug samples from the West Side of Chicago tested positive for elevated levels of medetomidine. Medetomidine has not previously been detected in Chicago, although it has recently been detected in Philadelphia. In Chicago, medetomidine has been detected in combination with fentanyl, heroin, xylazine, alprazolam and nitazenes.

Medetomidine Information

Medetomidine is a veterinary tranquilizer like xylazine but is considered more potent. It has no approved use in humans. Like its dextro-isomer dexmedetomidine (sold as Precedex® or Dexdor®), medetomidine is an alpha-2-adrenergic receptor agonist causing sedation, analgesia, bradycardia, prolonged hypotension following initial hypertension, and peripheral vasoconstriction. Other clinical indicators of medetomidine toxicity include dry mouth, mydriasis, hypothermia, and spontaneous muscle contractions (twitching). There are very few documented cases of medetomidine toxicity in humans.

Medetomidine can cause respiratory depression, which can be greater when taken with other opioid and non-opioid sedatives. Naloxone will not reverse the effects of medetomidine, a non-opioid substance. There are no recommended reversal agents for use in humans. Notably, naloxone should still be used for all suspected drug overdoses as fentanyl usually co-occurs with other substances. There are no immunoassay test strips available for detecting the presence of medetomidine in drug or urine samples.



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PUBLIC ALERT

MAY 2024

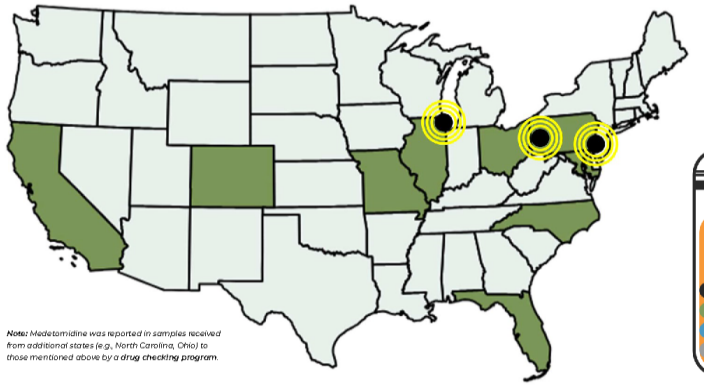
MEDETOMIDINE RAPIDLY PROLIFERATING ACROSS USA — IMPLICATED IN RECREATIONAL OPIOID DRUG SUPPLY & CAUSING OVERDOSE OUTBREAKS

PURPOSE: The objective of this announcement is to notify public health, harm reduction, first responders, clinicians, medical examiners and coroners, forensic and clinical laboratories, and all other related communities about new information surrounding the emergent adulterant **medetomidine** (also referred to as dexmedetomidine).

BACKGROUND: Medetomidine is an alpha-2 agonist, belonging to the same family of drugs as xylazine and clonidine. Medetomidine is synthetically manufactured and exists in two enantiomeric forms: **dexmedetomidine** and levomedetomidine, the former being active and potent. Dexmedetomidine is approved for use in humans and is administered in hospital, while differing forms of medetomidine are available for use in veterinary medicine. The effects of **medetomidine** can include sedation, analgesia, muscle relaxation, anxiolysis, bradycardia, hypotension, hyperglycemia, and hallucinations. Duration of action is noted to be longer for medetomidine relative to xylazine.

SUMMARY: Medetomidine is the latest CNS depressant to appear as an adulterant alongside fentanyl in the recreational drug supply. Recent mass overdose outbreaks in Philadelphia, Pittsburgh, and Chicago have all been associated with fentanyl or heroin drug products containing medetomidine, as well xylazine and/or other substances. In cases where medetomidine ingestion is suspected or confirmed, severe adverse effects have been noted, including **heightened sedation and profound bradycardia**.

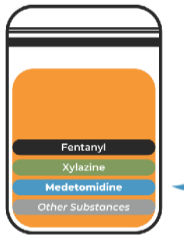
TIMEFRAME	DESCRIPTION OF MEDETOMIDINE IDENTIFICATIONS AND OVERDOSE EVENTS
Late 2022	Medetomidine begins appearing more regularly in the **Maryland** drug supply, following its first detection in July 2022. Medetomidine is commonly identified alongside fentanyl, xylazine, and other substances.
Mid-to-Late 2023	Medetomidine is sporadically identified in toxicology specimens collected from patients presenting to emergency departments after suspected opioid overdose (confirmed to not be administered). Overdose events originated from **Missouri, Colorado, Pennsylvania, California, and Maryland**. Medetomidine is commonly detected with fentanyl.
January 2024	An **alert** is issued out of **Toronto, ON**, about the emergence of medetomidine in the drug supply. This is followed by increased positivity in subsequent weeks and months, as medetomidine is found alongside fentanyl in suspected opioid products and commonly in combination with xylazine and other substances.
Early 2024	Medetomidine detections increase in drug materials and toxicology specimens originating from western Canada, including **Vancouver, BC**, commonly alongside fentanyl and other opioids.
Late April 2024	Medetomidine first appears in drug products in **Philadelphia, PA**, causing a large scale outbreak of overdoses and adverse events. Medetomidine is identified alongside fentanyl and xylazine.
Early May 2024	Medetomidine first appears in drug products in **Pittsburgh, PA**, causing a large scale outbreak of overdoses and adverse events. Medetomidine is identified alongside fentanyl and xylazine.
Early May 2024	Medetomidine first appears in drug products in **Chicago, IL**, causing a large scale outbreak of overdoses and adverse events. Medetomidine is identified alongside fentanyl and xylazine, or alongside heroin without xylazine.

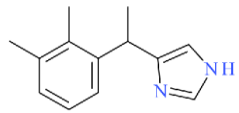


***Note:** Medetomidine was reported in samples received from additional states (e.g., North Carolina, Ohio) to those mentioned above by a drug checking program.*

◂ GEOGRAPHICAL DISTRIBUTION OF MEDETOMIDINE EMERGENCE

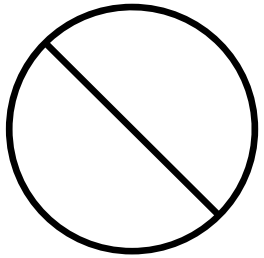
Medetomidine has been identified across several states in the U.S. and Canada, and is recently being observed in severe overdose outbreaks in major metropolitan areas (as marked).





Medetomidine is a potent veterinary tranquilizer.

- Non-opioid sedative
- Similar to xylazine but more potent
- Used for surgical anesthesia in animals
- No approved uses in humans
- Dexmedetomidine (Precedex) is used in humans for sedation
- Adverse effects: Respiratory depression, bradycardia, hypertension then hypotension



There are no reversal agents for medetomidine for use in humans.

History of Medetomidine as an Adulterant

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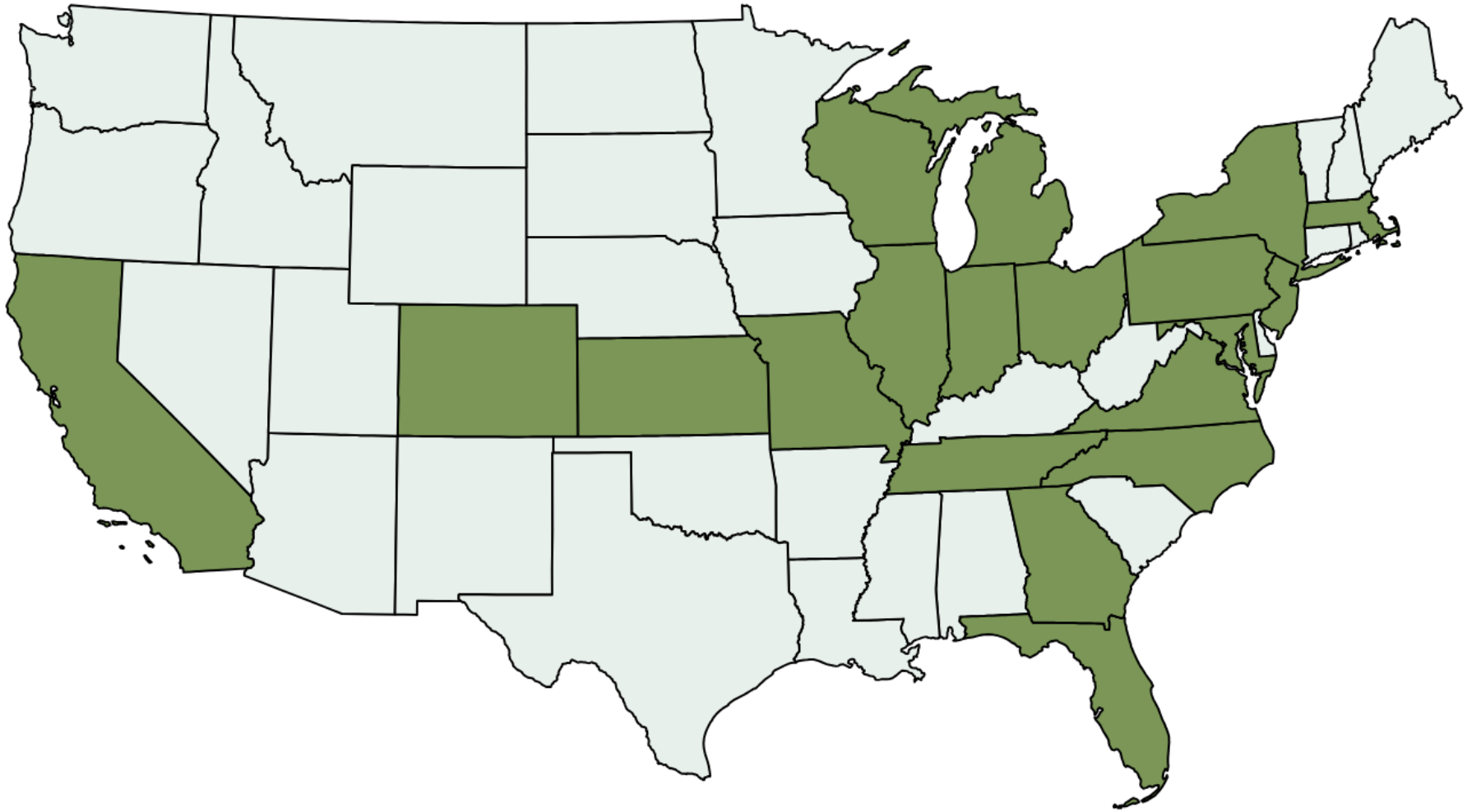
Early May 2024	Medetomidine first appears in drug products in **Chicago, IL**, causing a large scale outbreak of overdoses and adverse events. Medetomidine is identified alongside fentanyl and xylazine, or alongside heroin without xylazine.

Medetomidine as an adulterant has now been found in many states.



May 11

May 14

May 17

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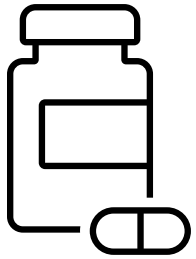
June 17

Epi-Aid Objectives



Summarize toxicology and drug testing data.

Epi-Aid Objectives

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Characterize the cluster of drug overdoses through medical chart review and linked toxicology data.

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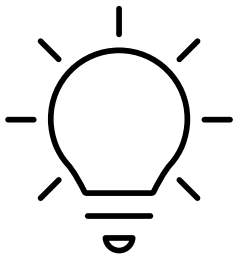


Provide public health recommendations for prevention.

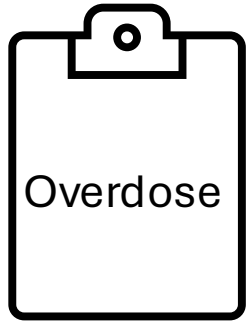
Methods

N = 245

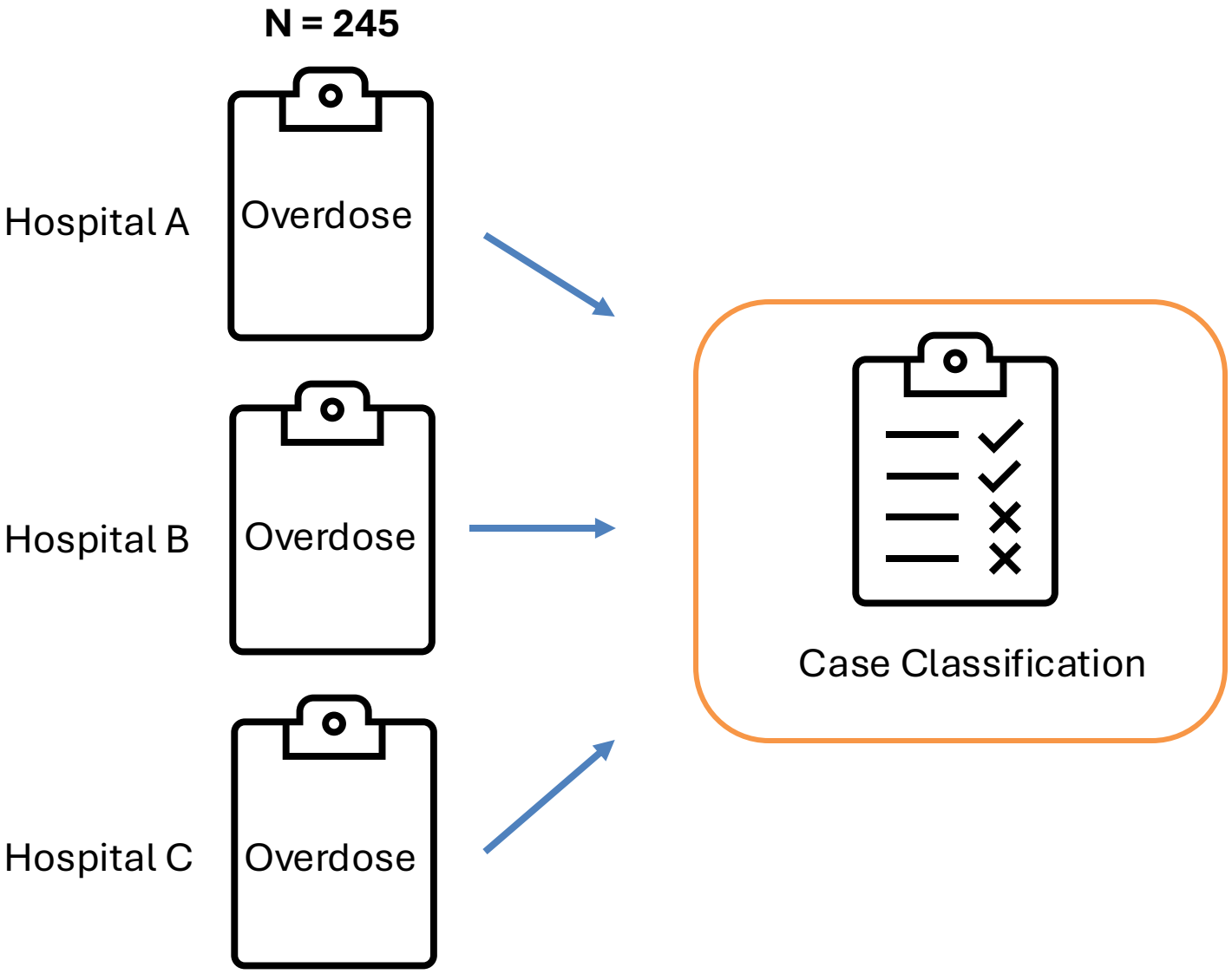
Hospital A

Hospital B

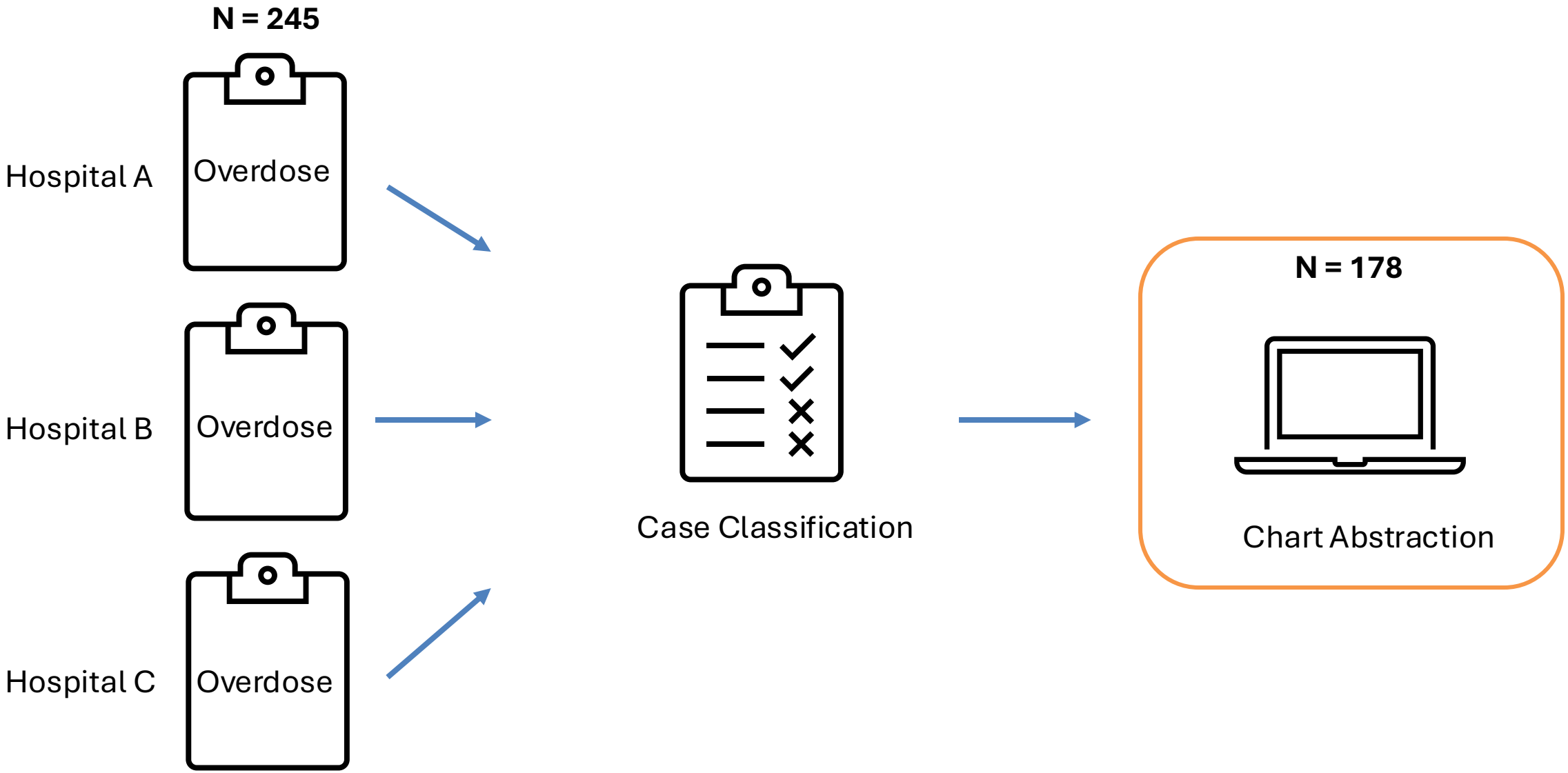
Hospital C



Methods


N = 245
Hospital A
Overdose
Hospital B
Overdose
Hospital C
Overdose
Case Classification

Methods


N = 245
Hospital A
Overdose
Hospital B
Overdose
Hospital C
Overdose
Case Classification
N = 178
Chart Abstraction

Case Definition

A case was defined as anyone who:

Case Definition

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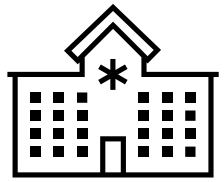

presented to the emergency departments at 3 hospitals in the West side of Chicago

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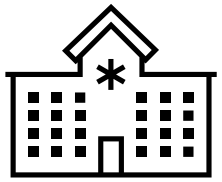
A case was defined as anyone who:



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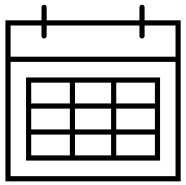

during May 11-17, 2024, and

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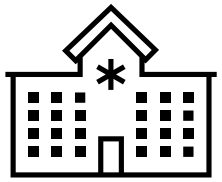

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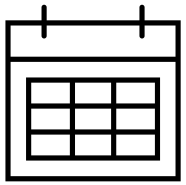
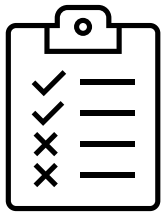
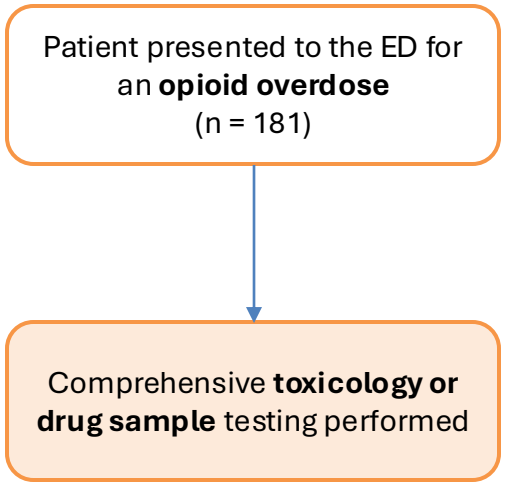


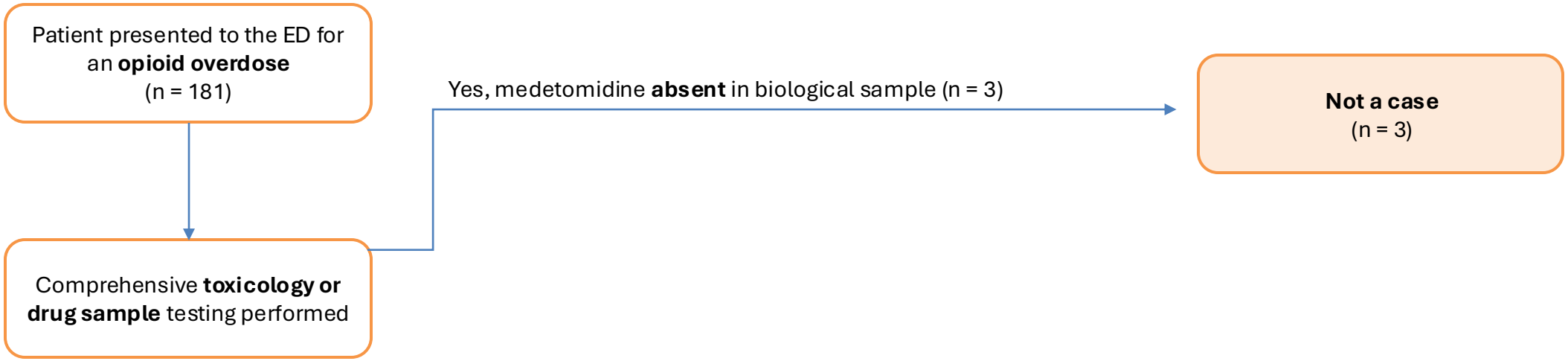
during May 11-17, 2024, and

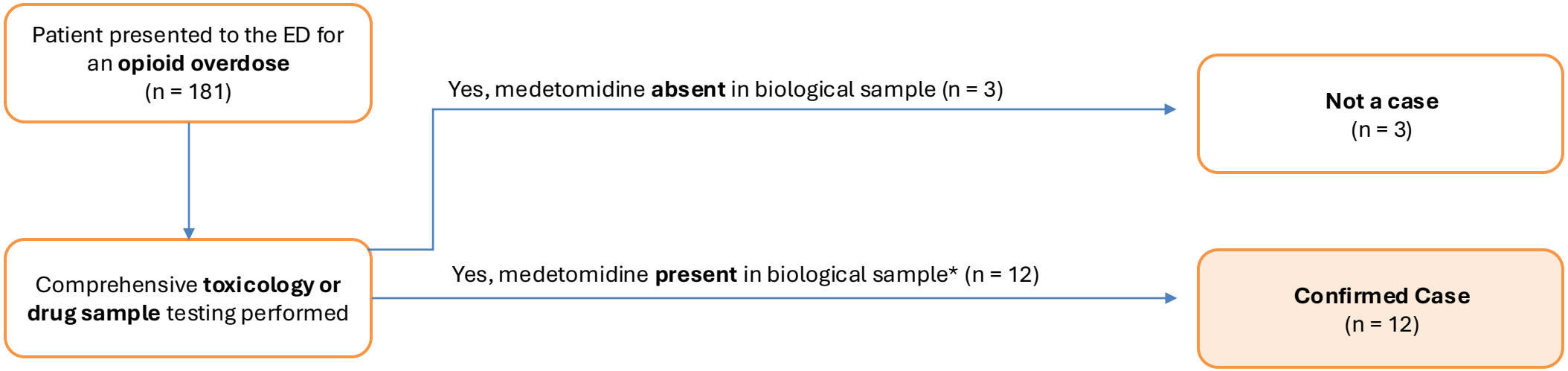


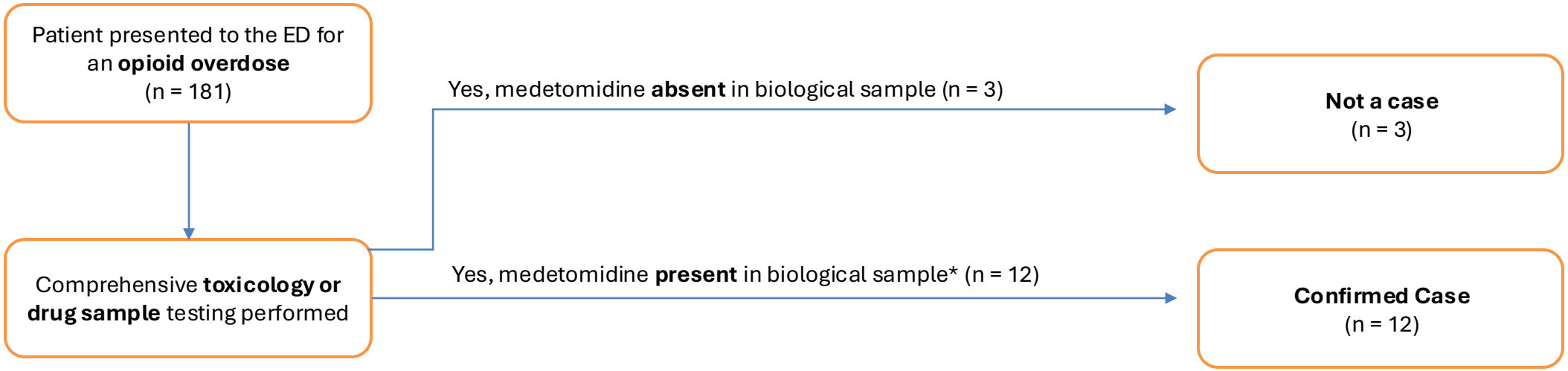
satisfied the criteria per the case classification algorithm.

Patient presented to the ED for an **opioid overdose**
(n = 181)

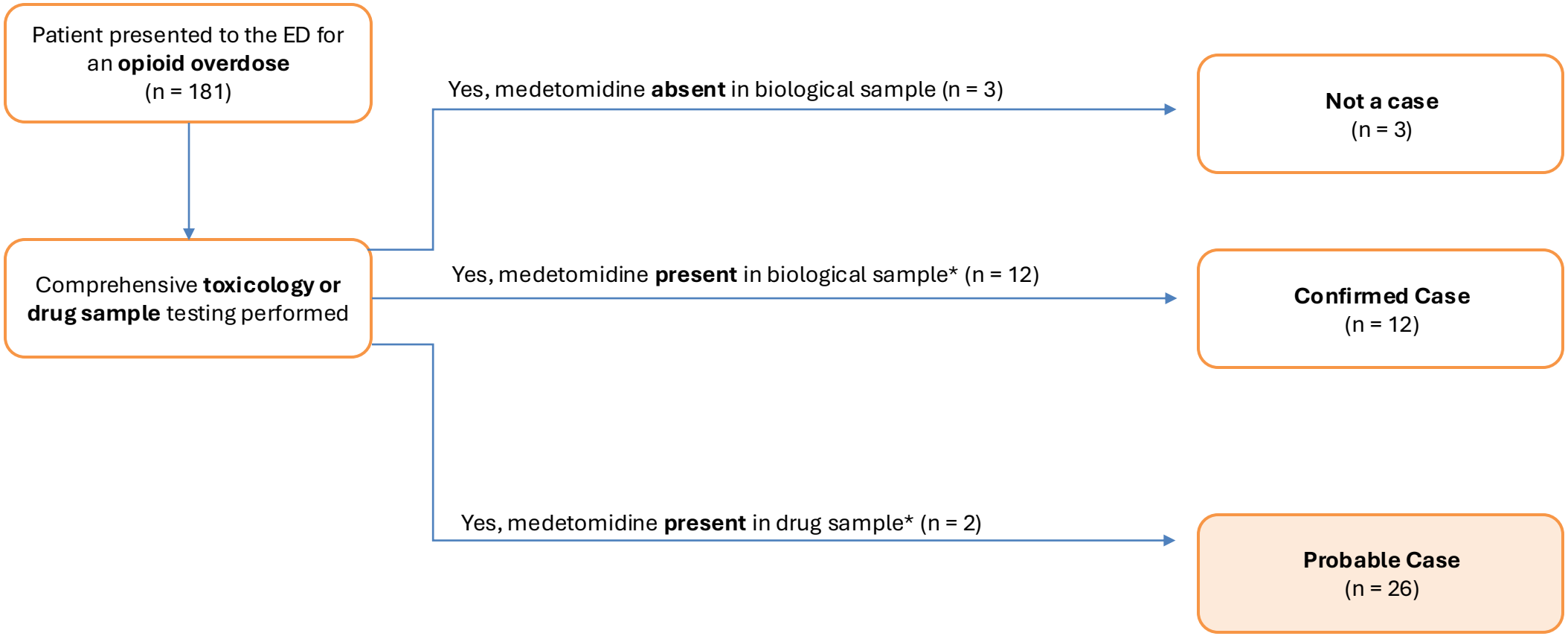

Patient presented to the ED for an **opioid overdose** (n = 181)
Comprehensive **toxicology or drug sample** testing performed


Patient presented to the ED for an **opioid overdose** (n = 181)
Comprehensive **toxicology or drug sample** testing performed
Yes, medetomidine **absent** in biological sample (n = 3)
Not a case (n = 3)


Patient presented to the ED for an **opioid overdose** (n = 181)
Comprehensive **toxicology or drug sample** testing performed
Yes, medetomidine **absent** in biological sample (n = 3)
Not a case (n = 3)
Yes, medetomidine **present** in biological sample* (n = 12)
Confirmed Case (n = 12)



***If comprehensive toxicology was performed for both biological and drug samples, results of biological sample supersede drug sample results for classification purposes.**



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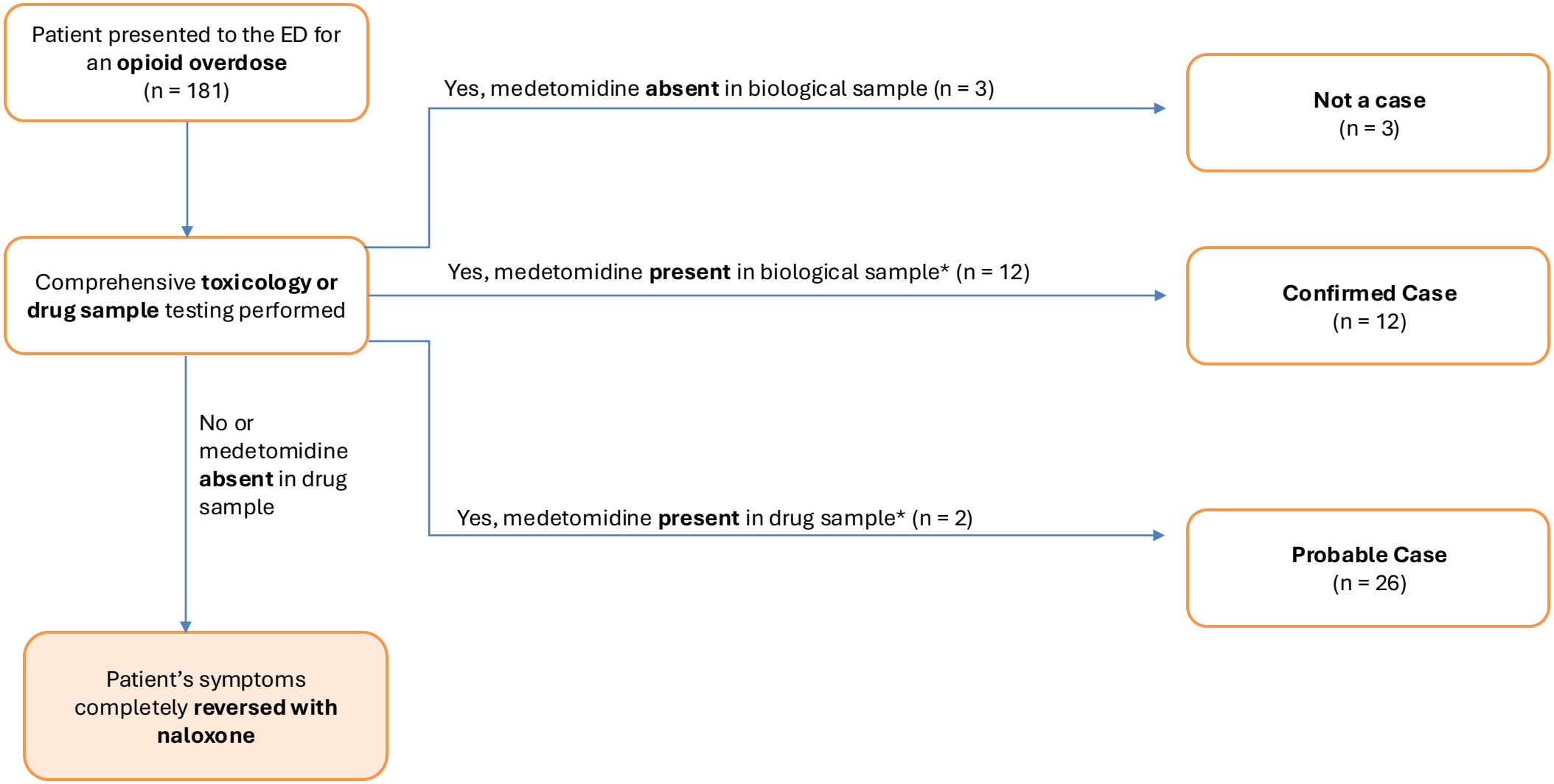

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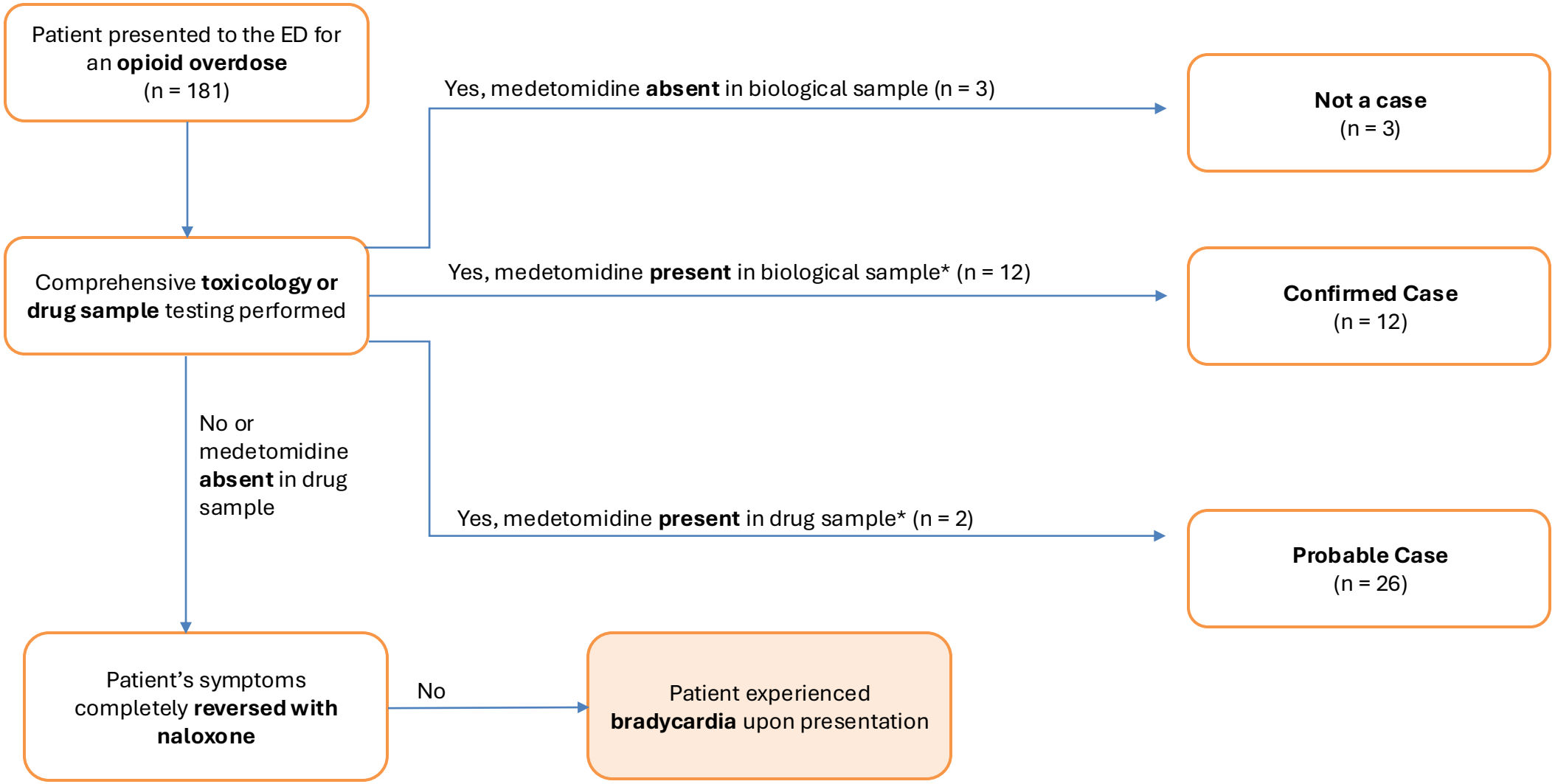

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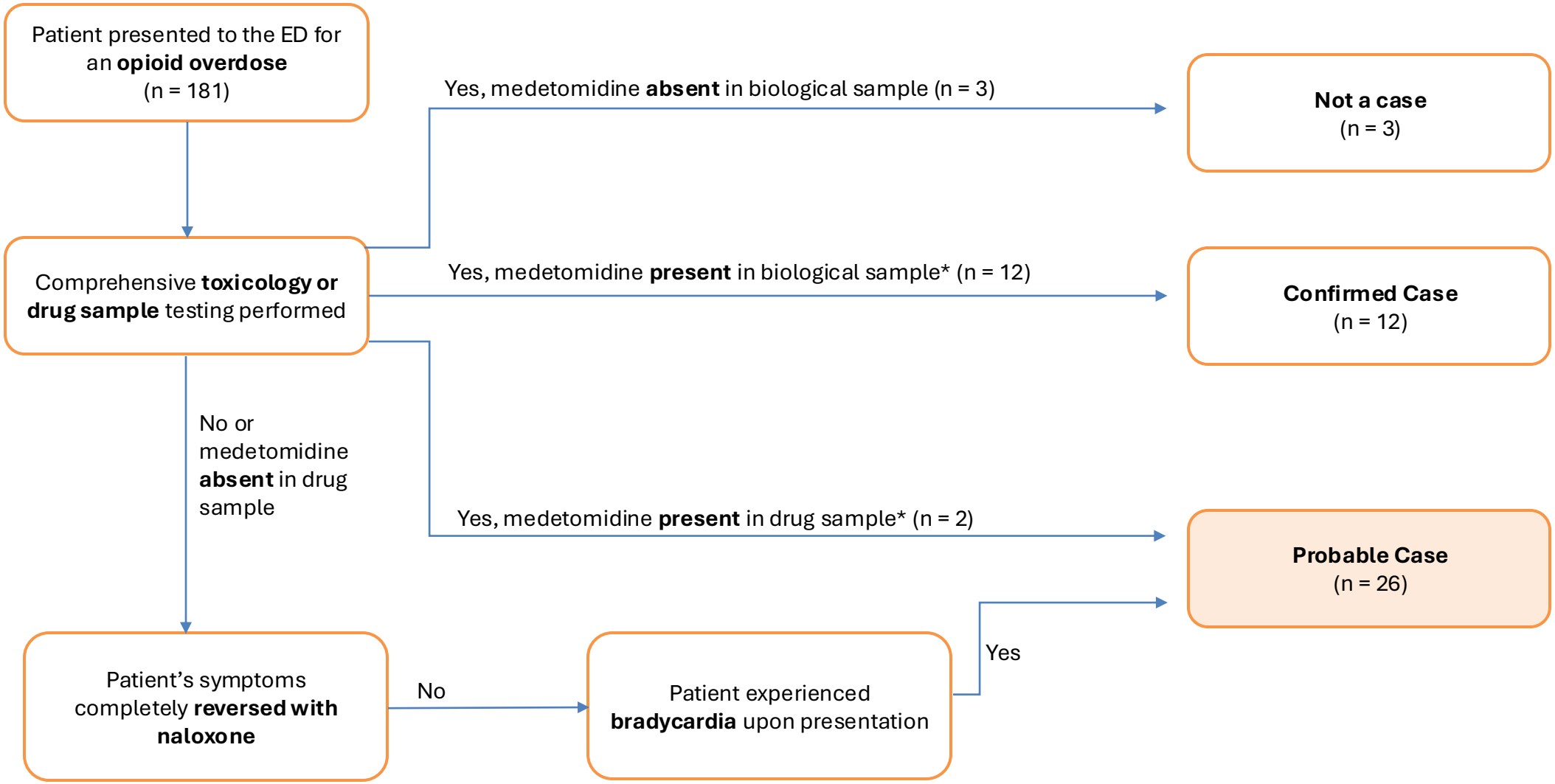
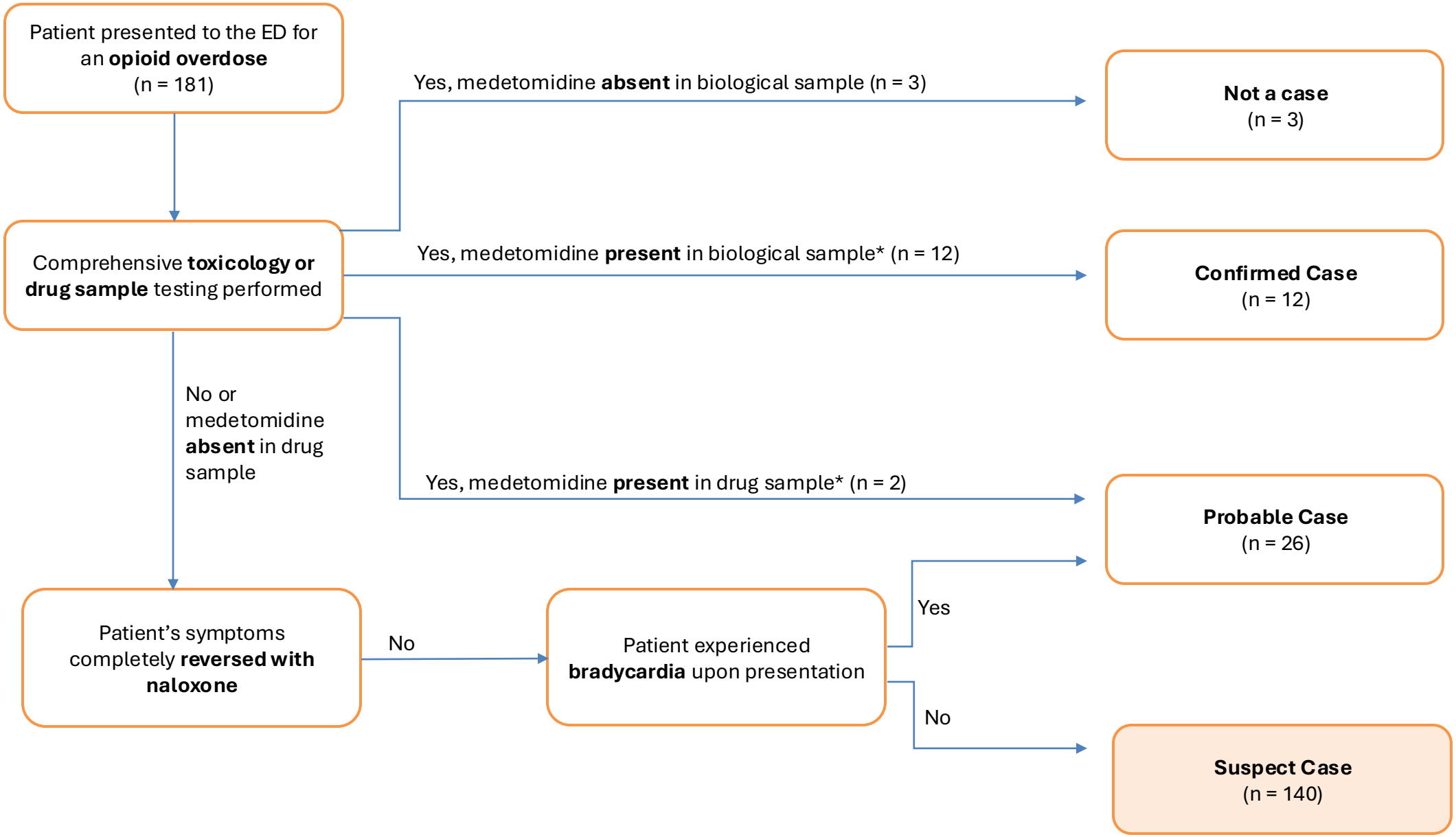


*If comprehensive toxicology was performed for both biological and drug samples, results of biological sample supersede drug sample results for classification purposes.



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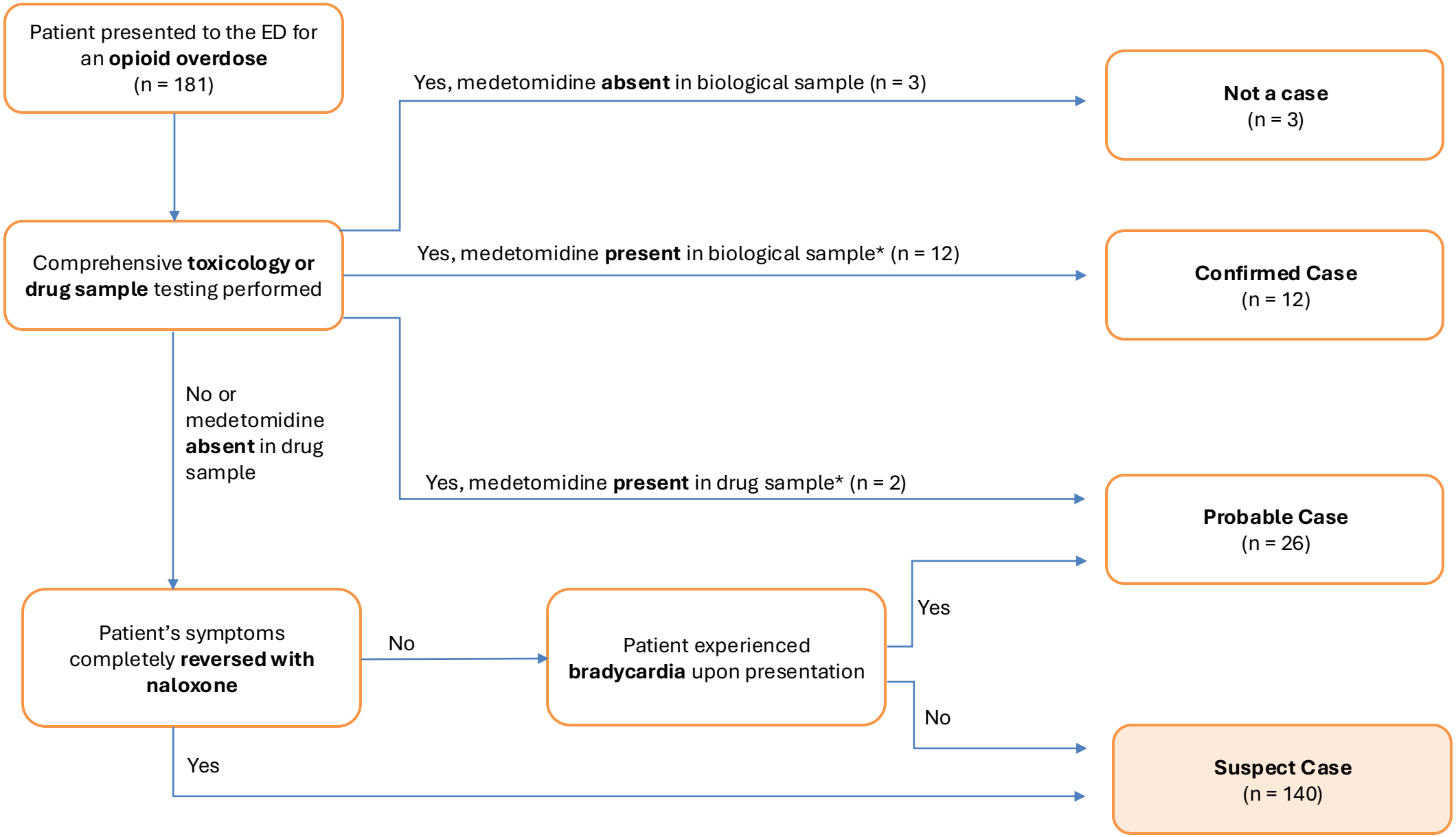
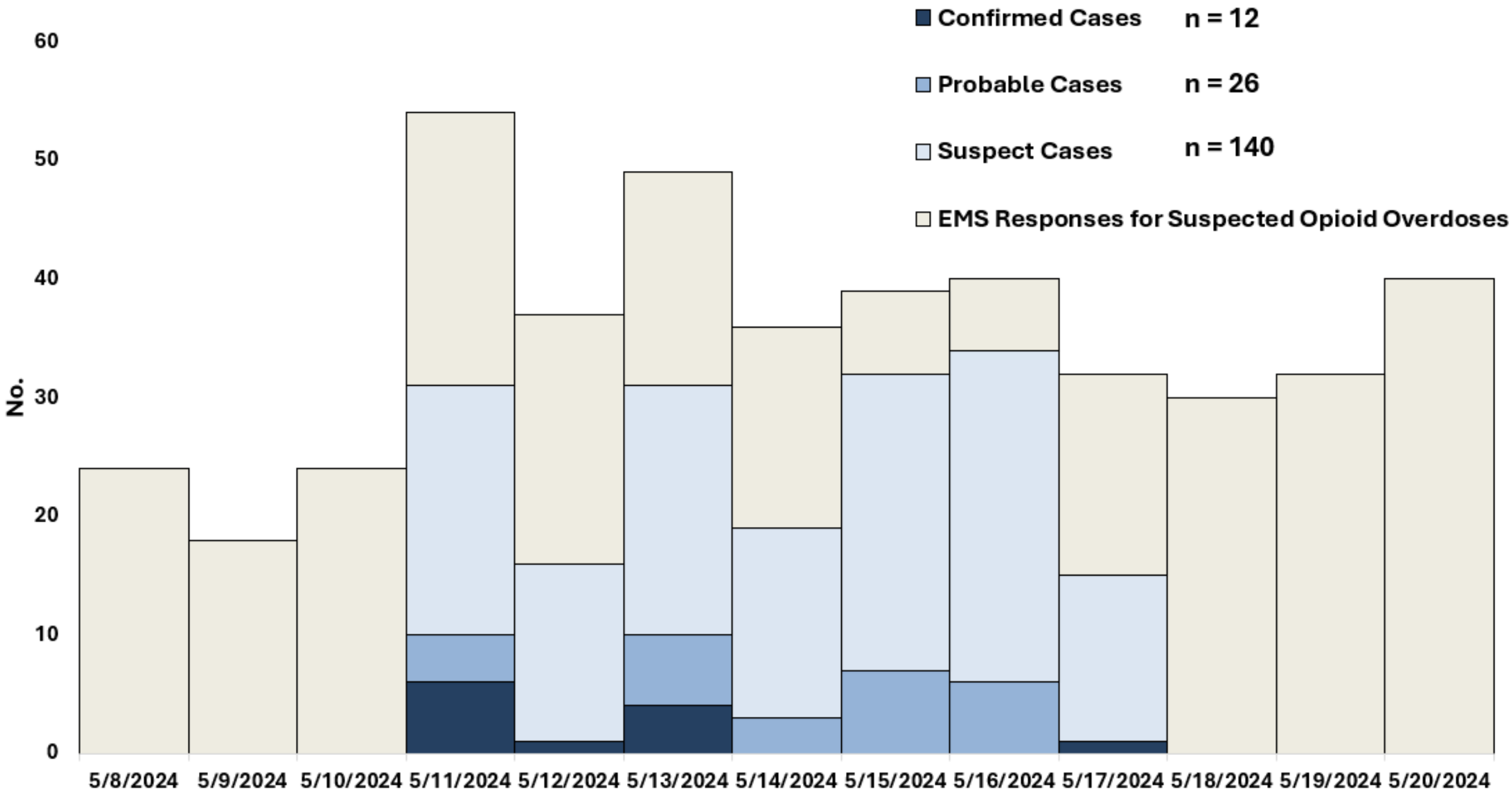


*If comprehensive toxicology was performed for both biological and drug samples, results of biological sample supersede drug sample results for classification purposes.


Confirmed Cases n = 12
Probable Cases n = 26
Suspect Cases n = 140
EMS Responses for Suspected Opioid Overdoses
No.
60
50
40
30
20
10
0
5/8/2024
5/9/2024
5/10/2024
5/11/2024
5/12/2024
5/13/2024
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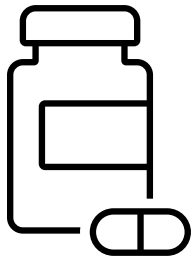
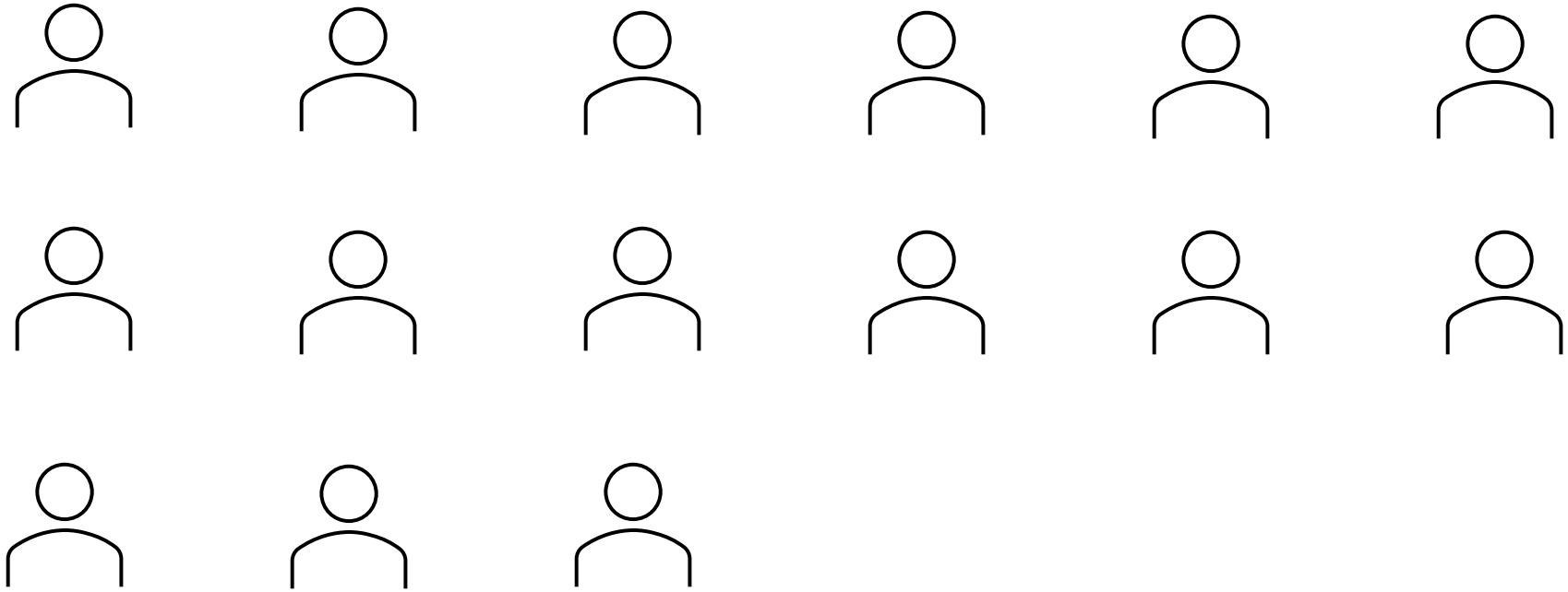
5/17/2024
5/18/2024
5/19/2024
5/20/2024



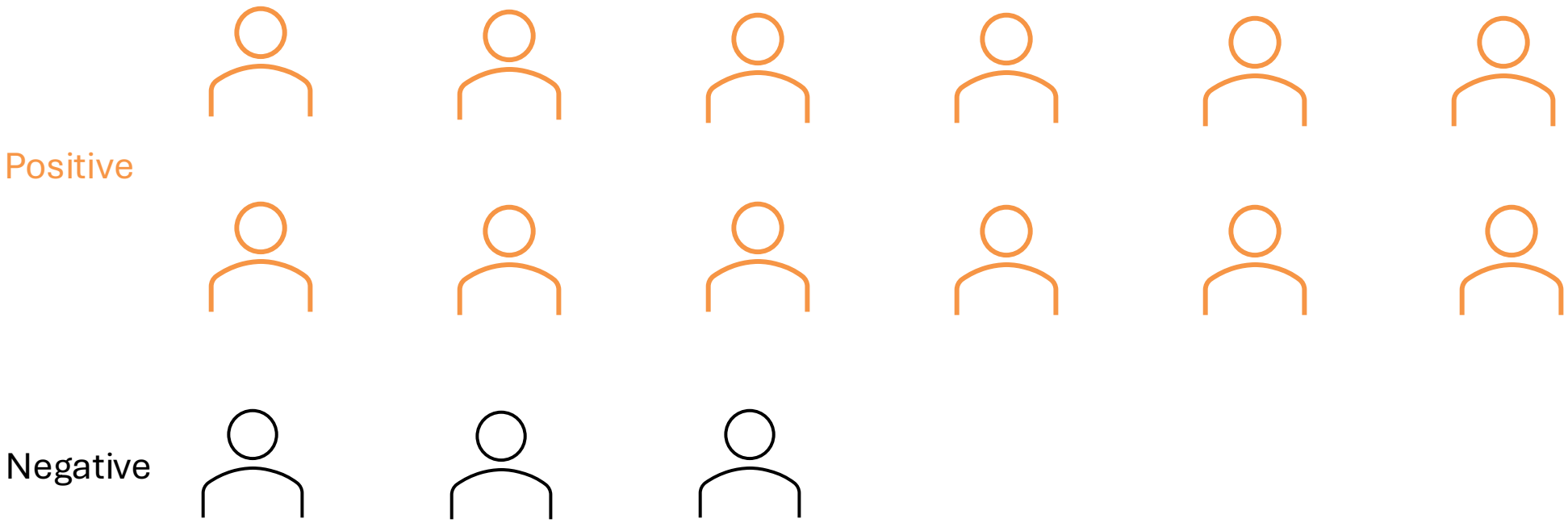
Objective 1: Summarize Toxicology and Drug Testing Data

There were 15 blood toxicology samples sent for testing.

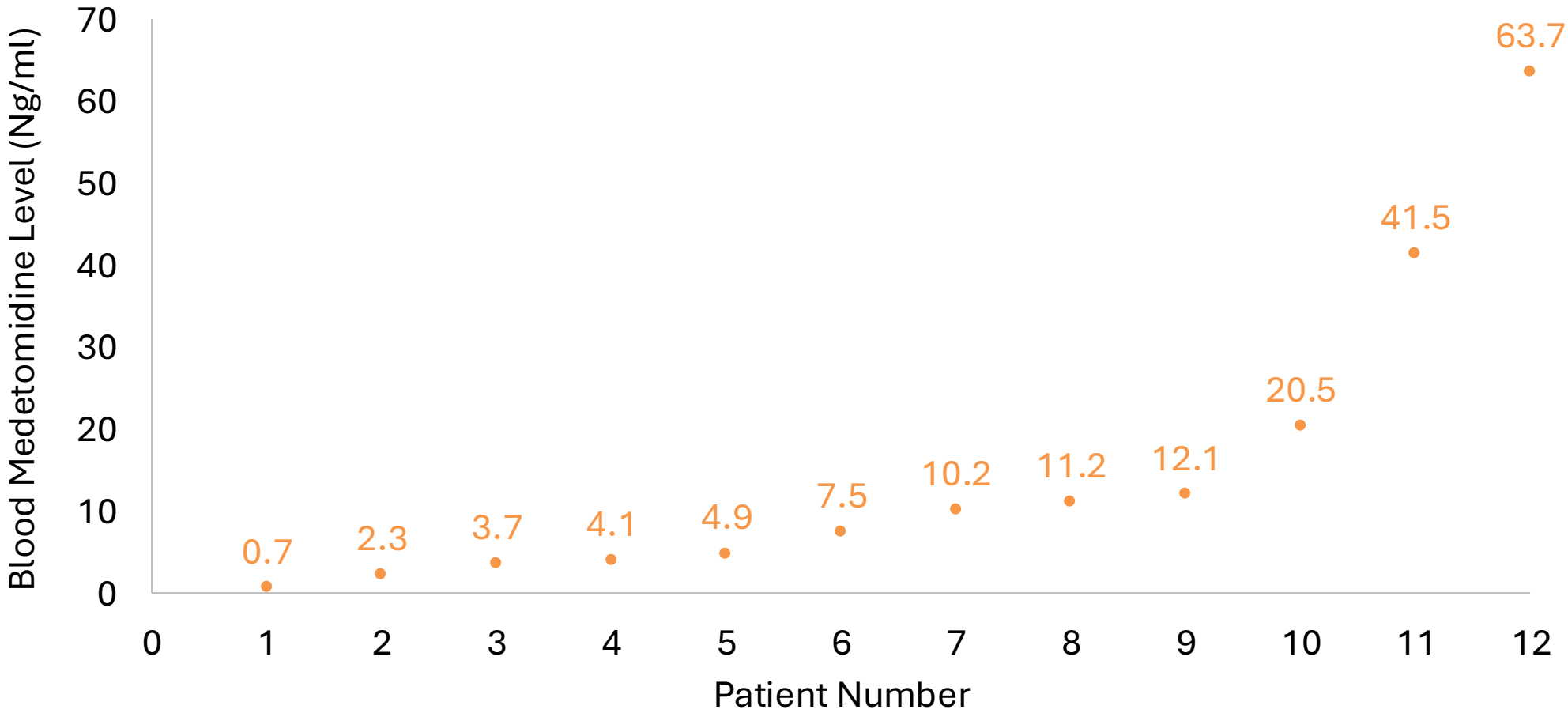


1 person icon : 1 case

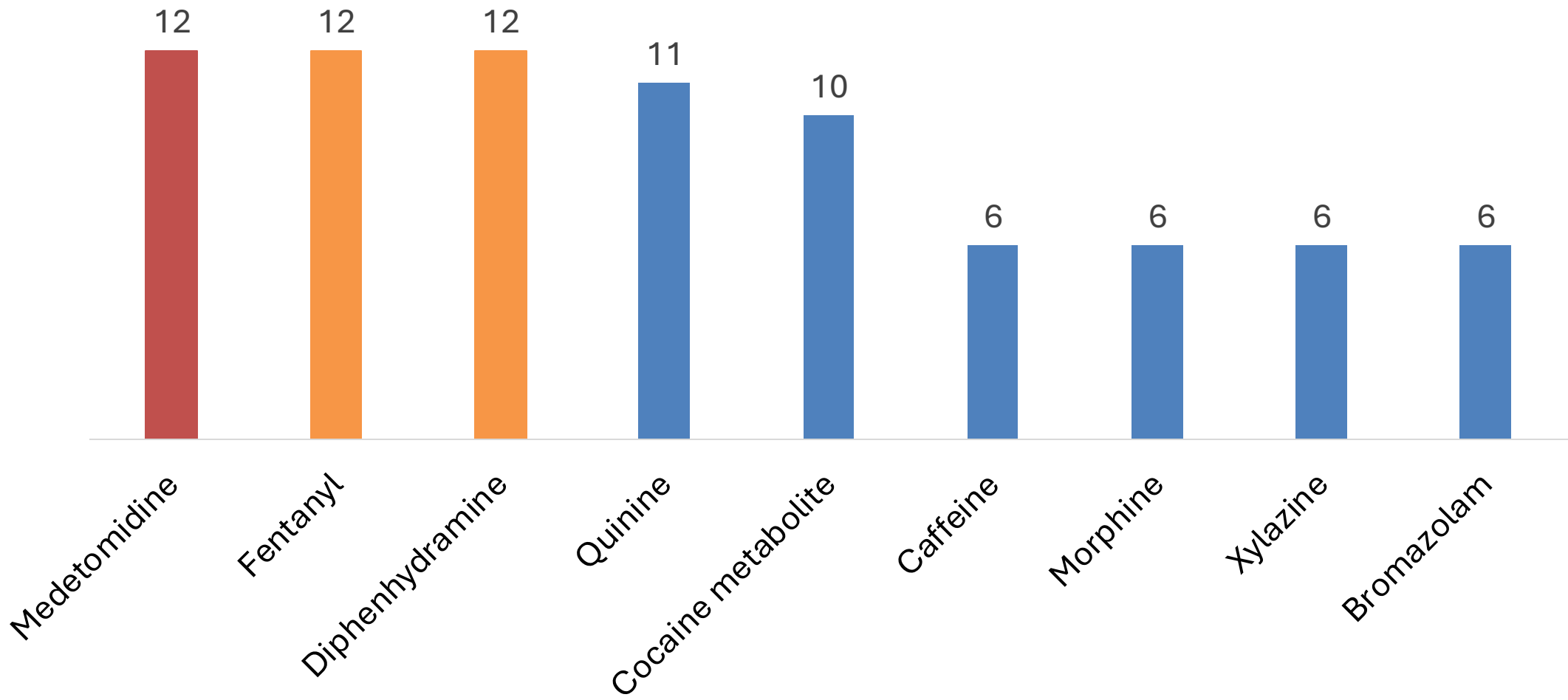
12 (80%) blood samples were positive for medetomidine.



Blood medetomidine levels ranged from 0.7 to 63.7 ng/ml.



All 12 blood samples also contained fentanyl and diphenhydramine.

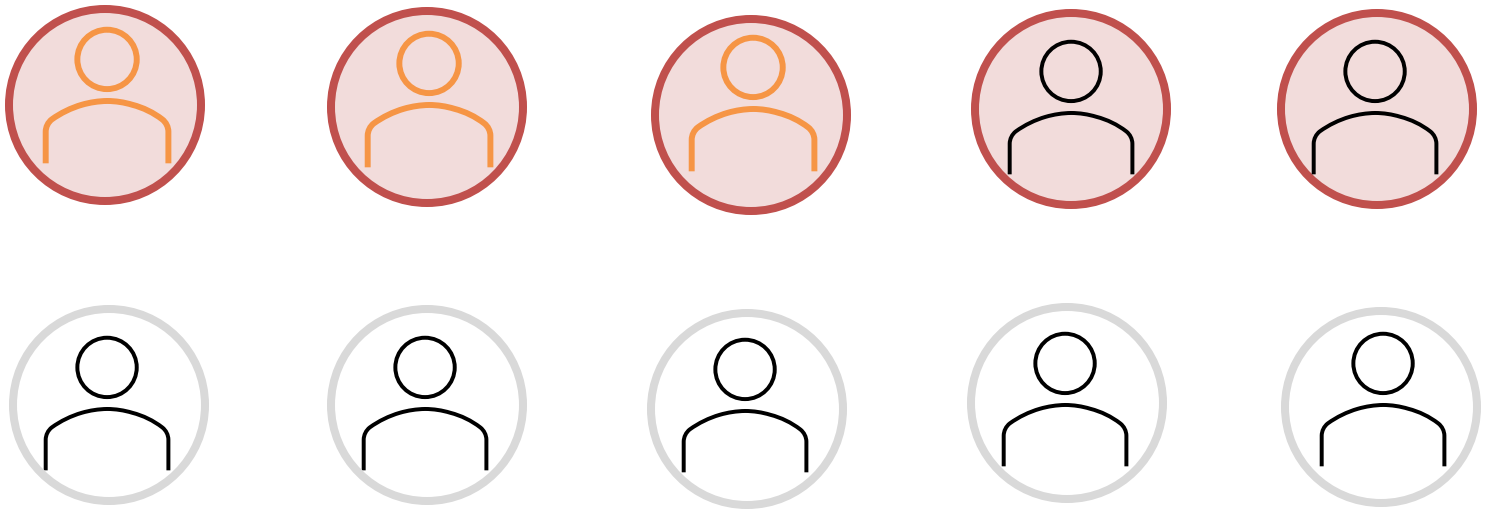


Ten drug samples were sent for testing.

Positive blood sample

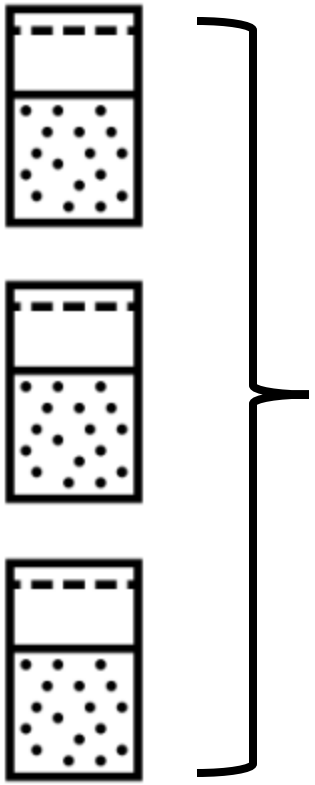
No blood sample

5 (50%) drug samples were positive for medetomidine.

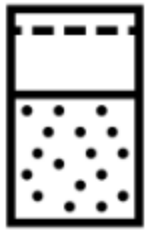


Positive drug sample

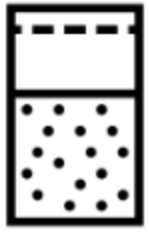
Medetomidine was not the only substance found in the drug samples.



Medetomidine (6.3-12p)
Diphenhydramine (2.6-3p)
Heroin (1p)
Fentanyl (trace)



Xylazine (2p)
Fentanyl (1p)
Medetomidine (0.6p)
Diphenhydramine (0.5p)
Quinine (0.5p)
Ketamine (0.2p)
Alprazolam (trace)
Metonitazene (trace)
N-pyrrolidino metonitazene (trace)
Para-fluorofentanyl (trace)



Fentanyl (209 ug/g)
Quinine (171 ug/g)
Xylazine (144 ug/g)
Diphenhydramine (104 ug/g)
Medetomidine (4.96 ug/g)
Cocaine (trace)
4-ANPP (trace)
6-acetyl morphine (trace)
Heroin (trace)
Despropionyl-para-fluorofentanyl (trace)
Para-fluorofentanyl (trace)

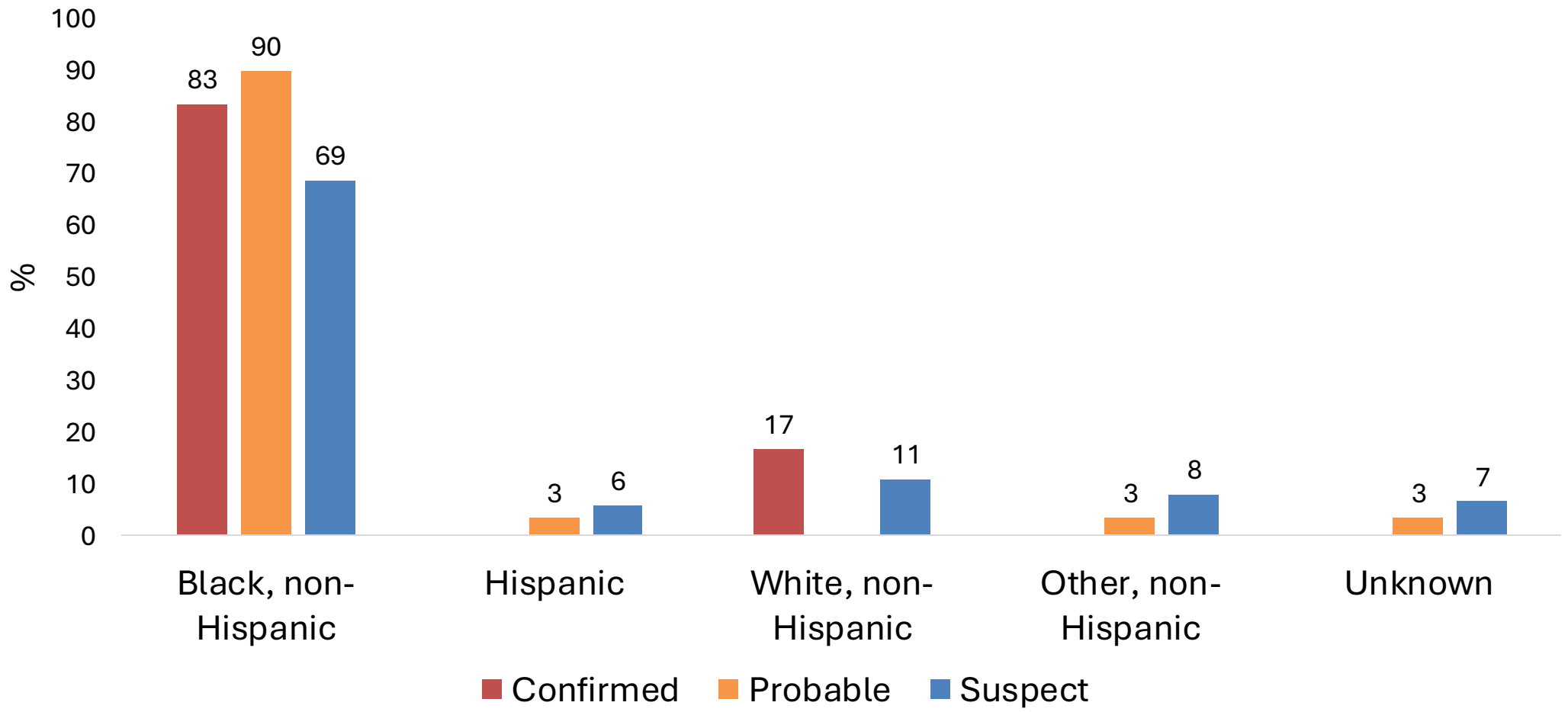
Objective 2: Characterizing the cluster

Most cases were male.

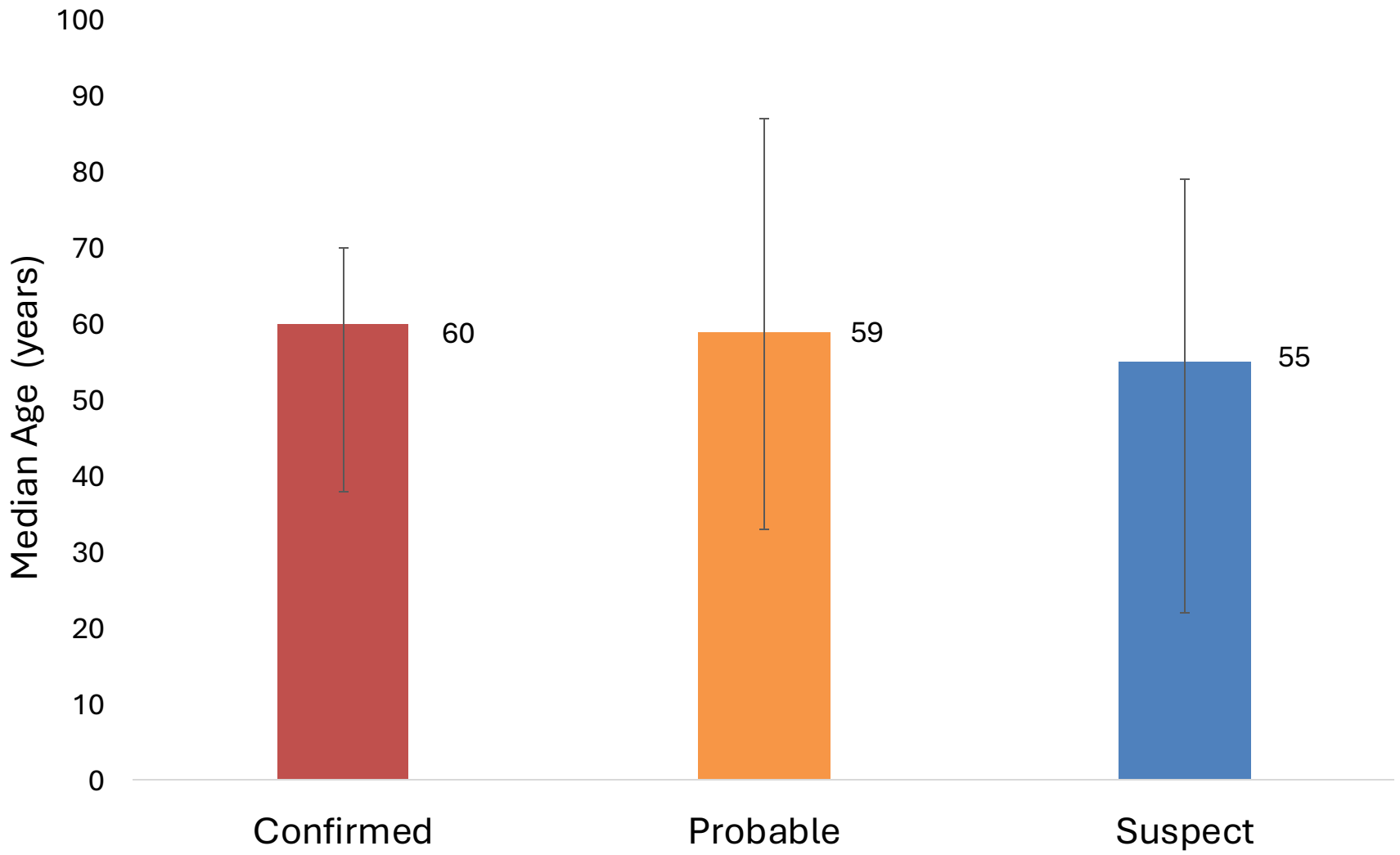
80%

20%

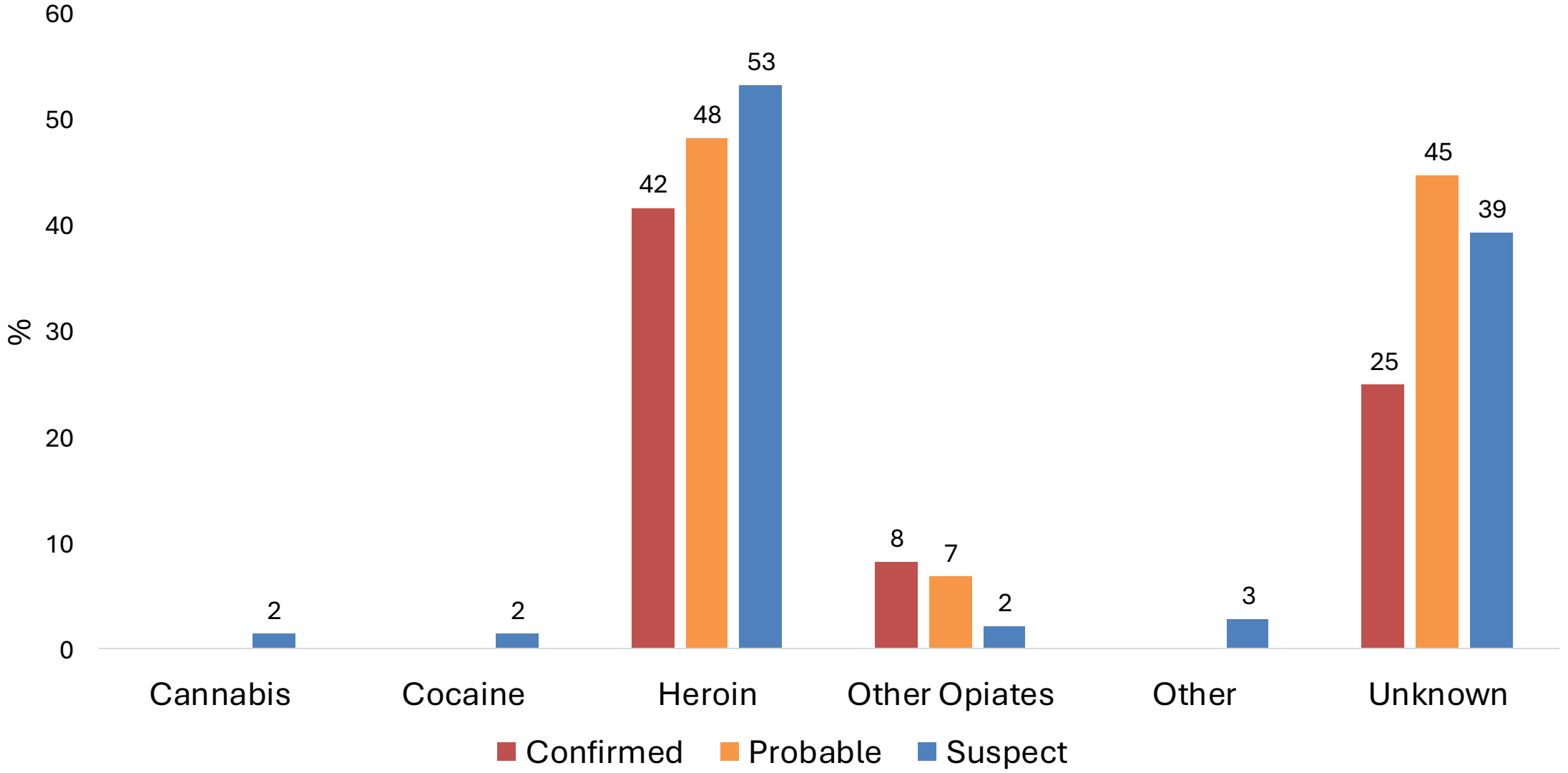
Most cases were Black, non-Hispanic.



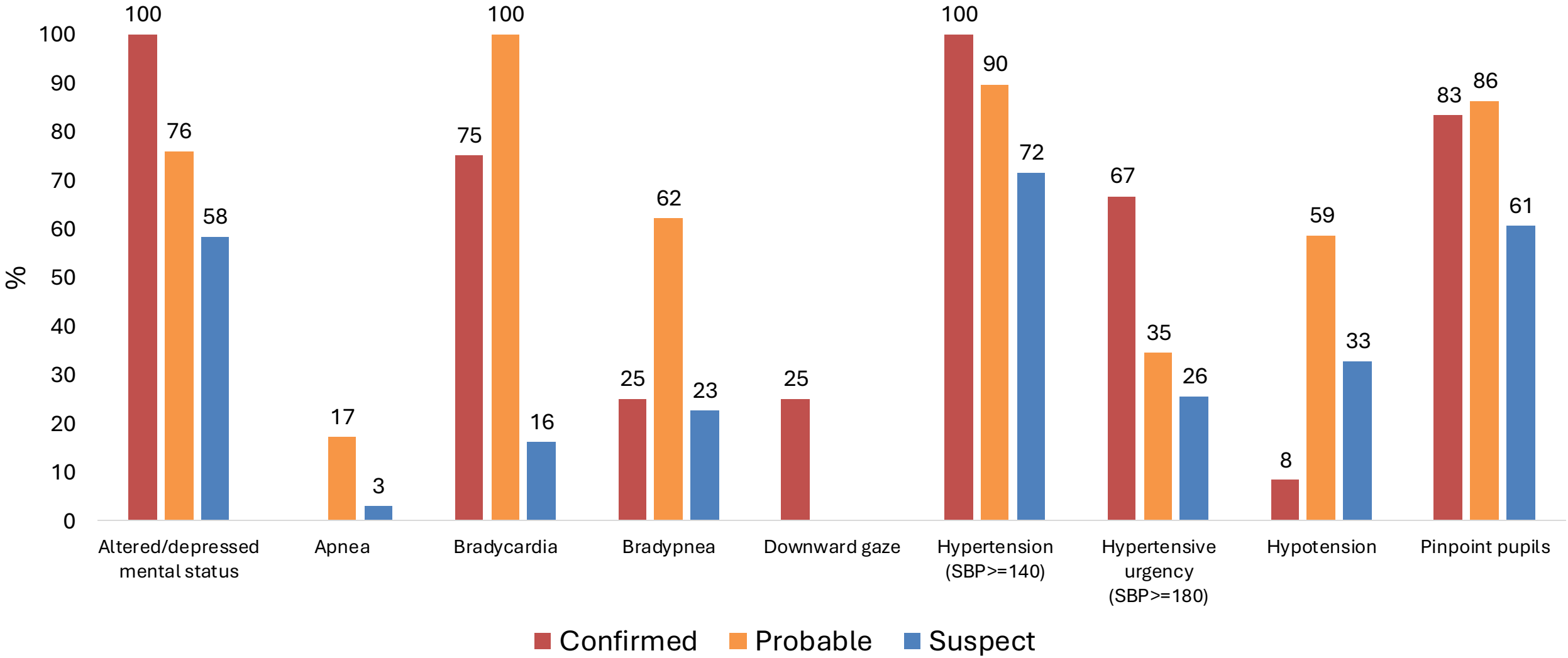
Median age of cases was similar.



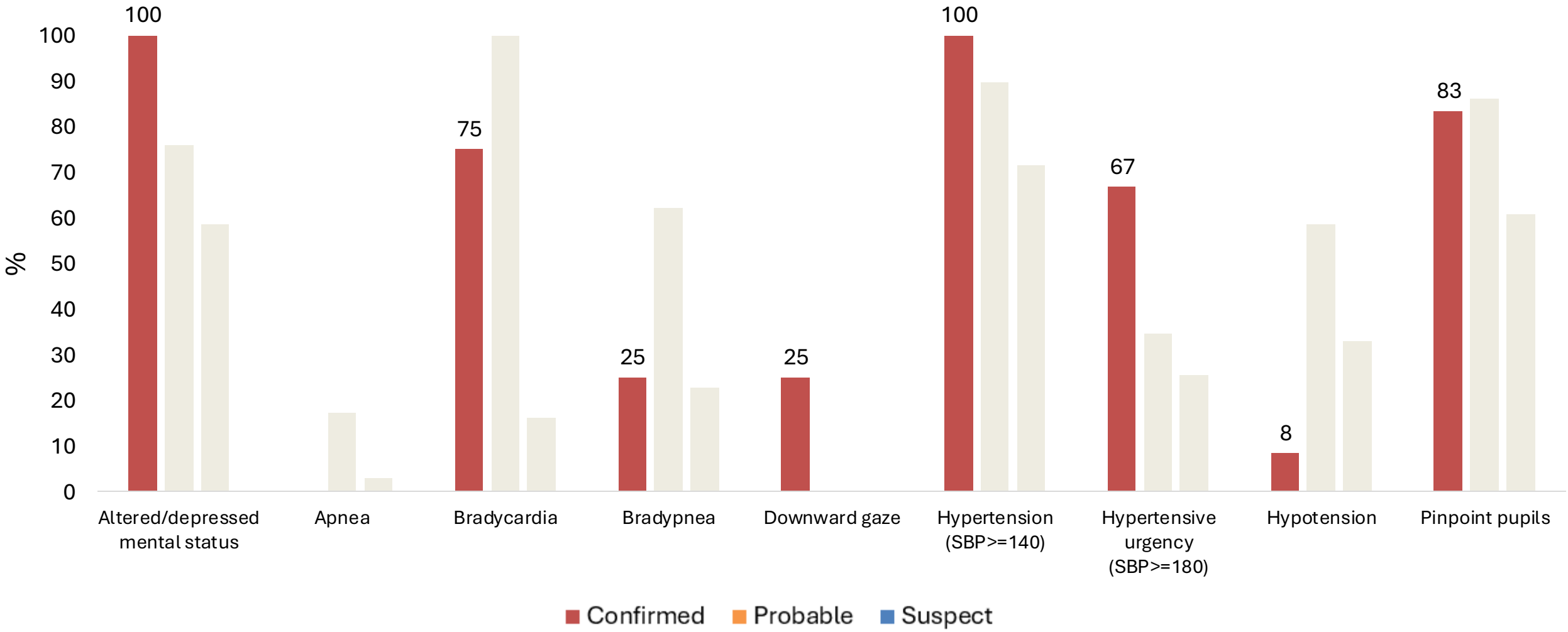
The most common reported drug used was heroin.



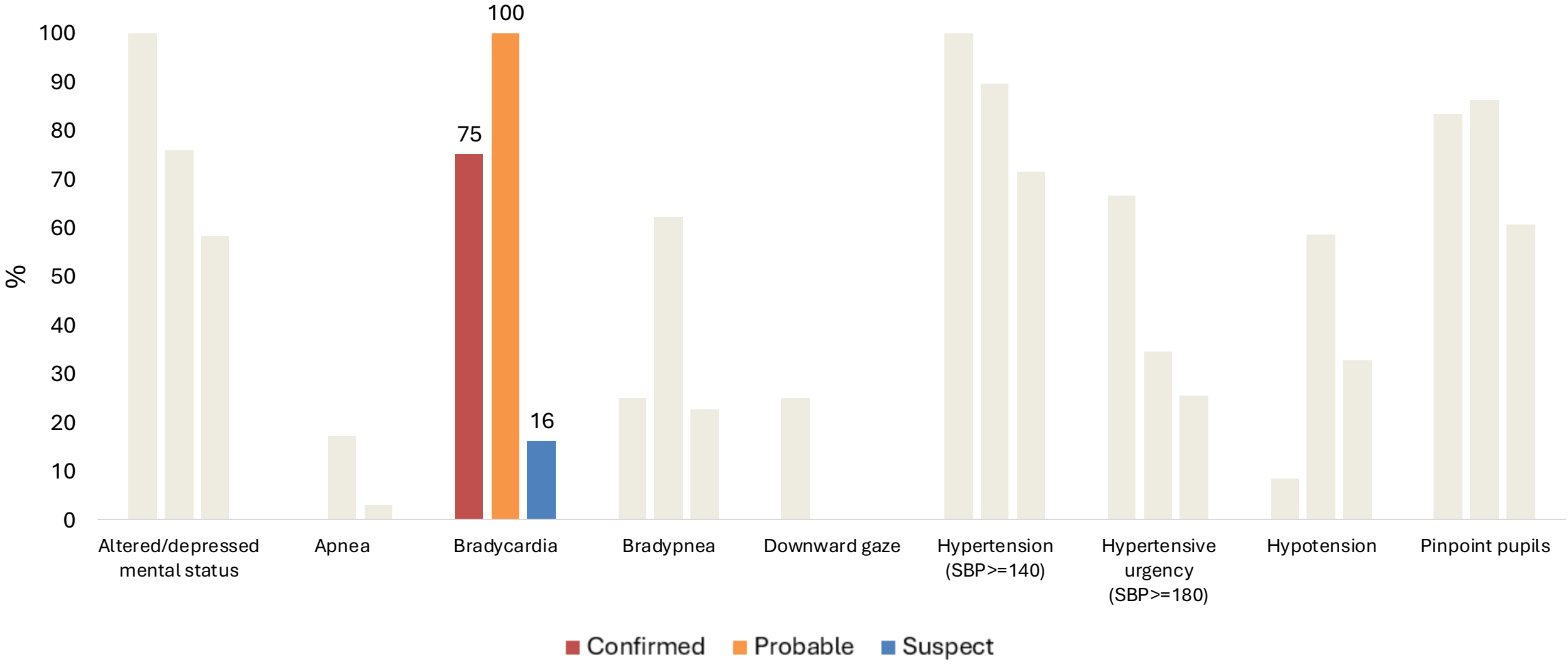
The most common symptoms upon presentation were…



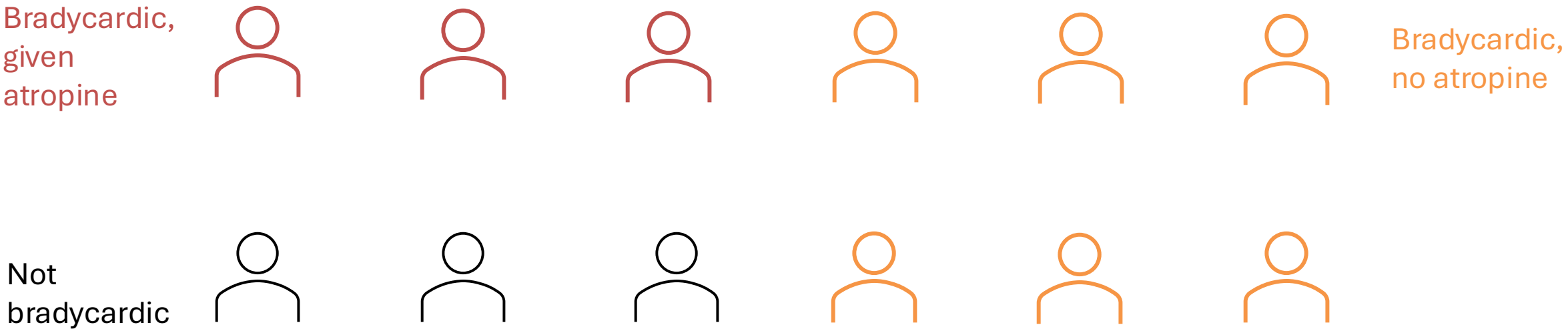
Among confirmed cases, the most common signs were altered mental status, hypertension, pinpoint pupils, and bradycardia.



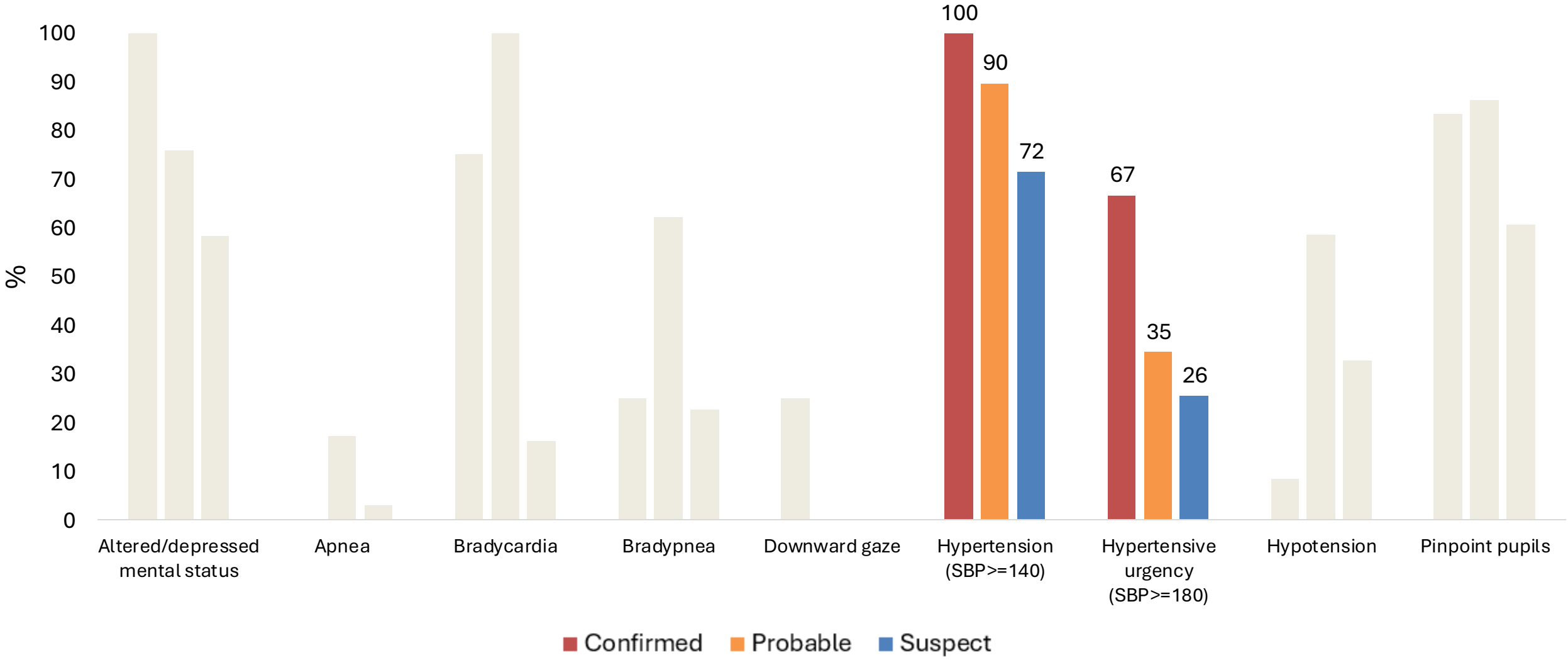
Most confirmed and all probable cases were bradycardic.



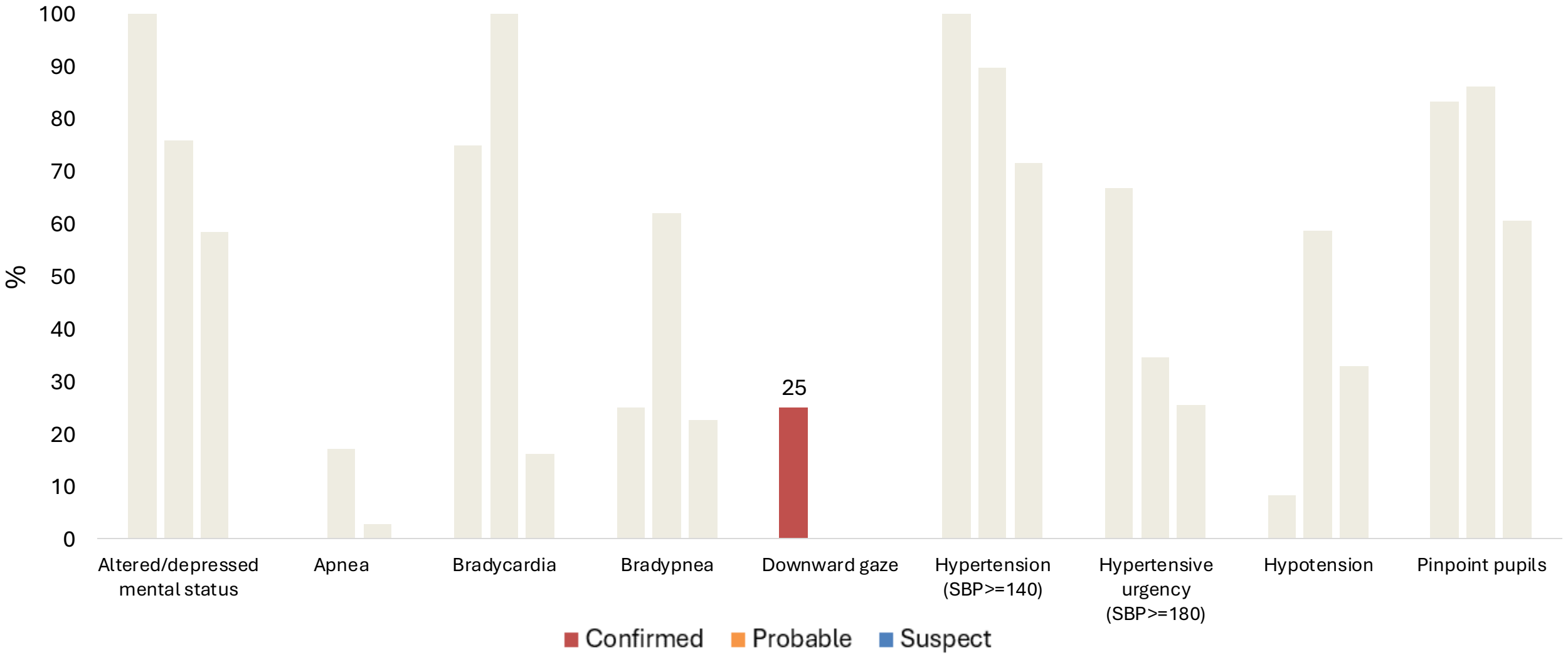
Among confirmed cases, 3 (25%) received atropine in the hospital.



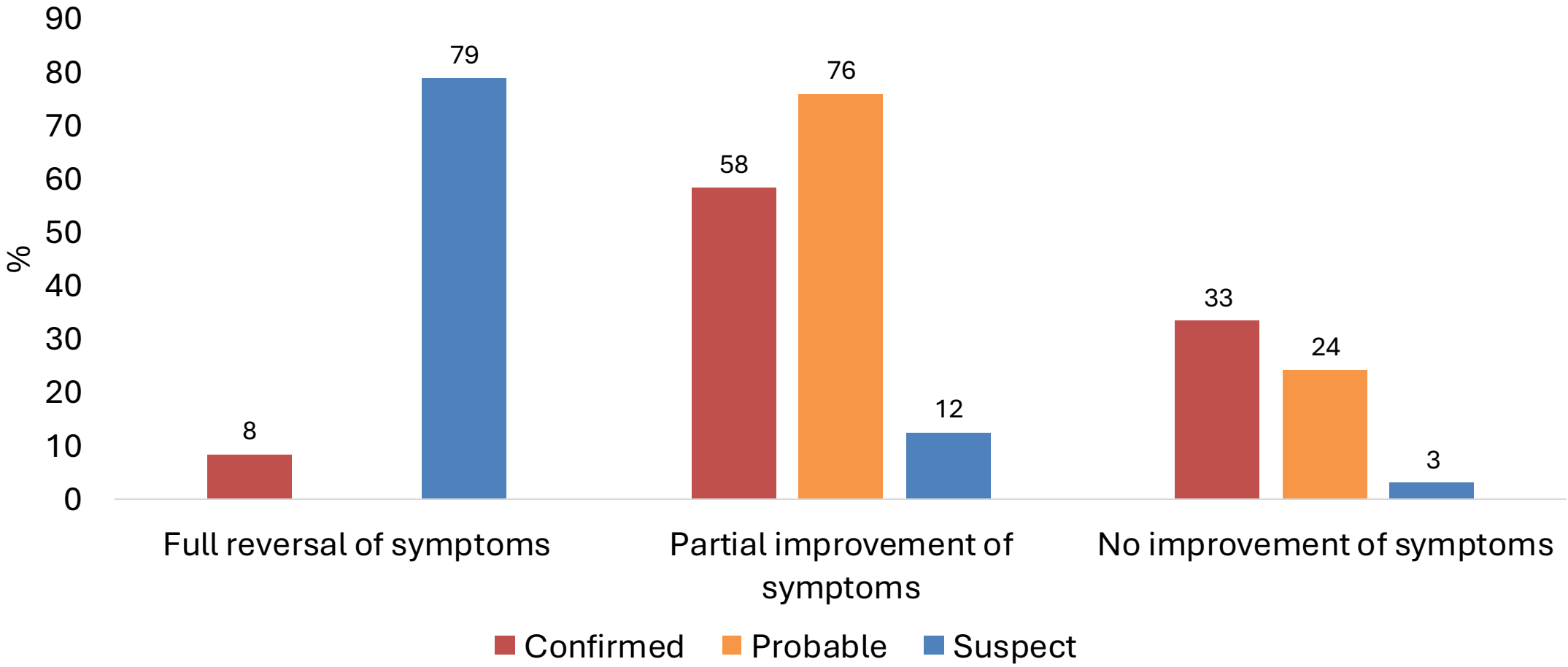
Hypertensive urgency was more common among confirmed cases.



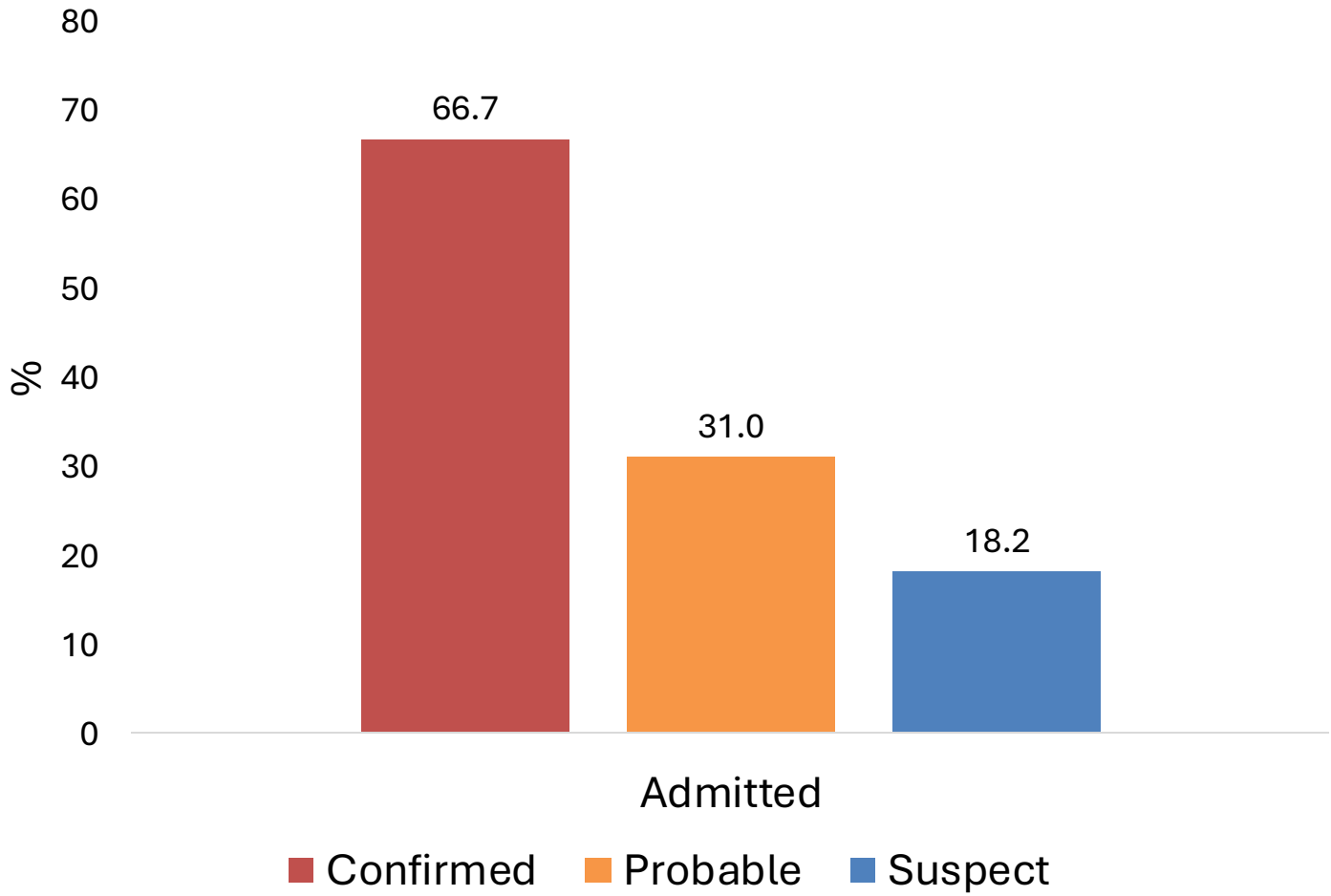
Downward gaze was only seen in confirmed cases.



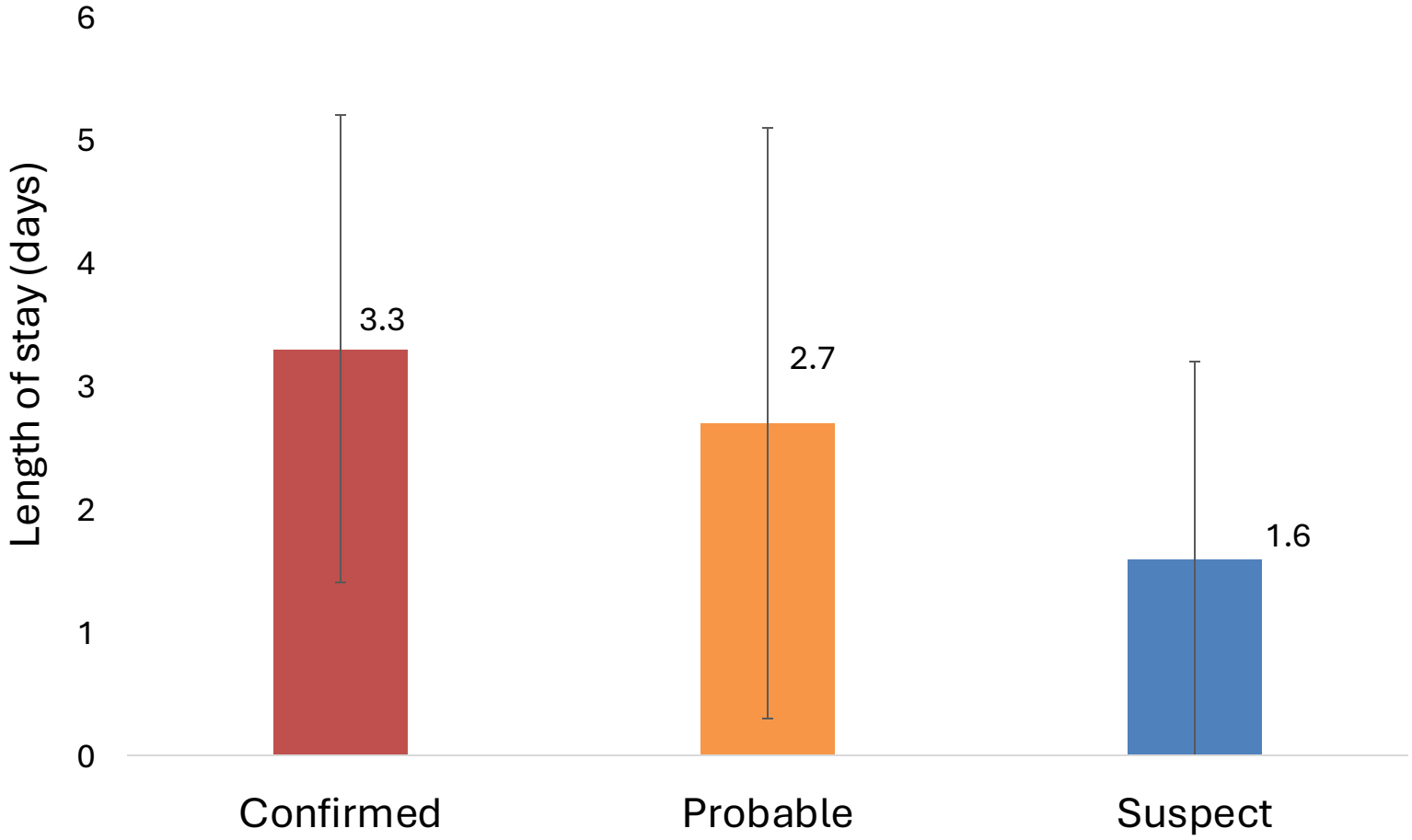
Suspect cases were more likely to have full reversal of symptoms with naloxone.



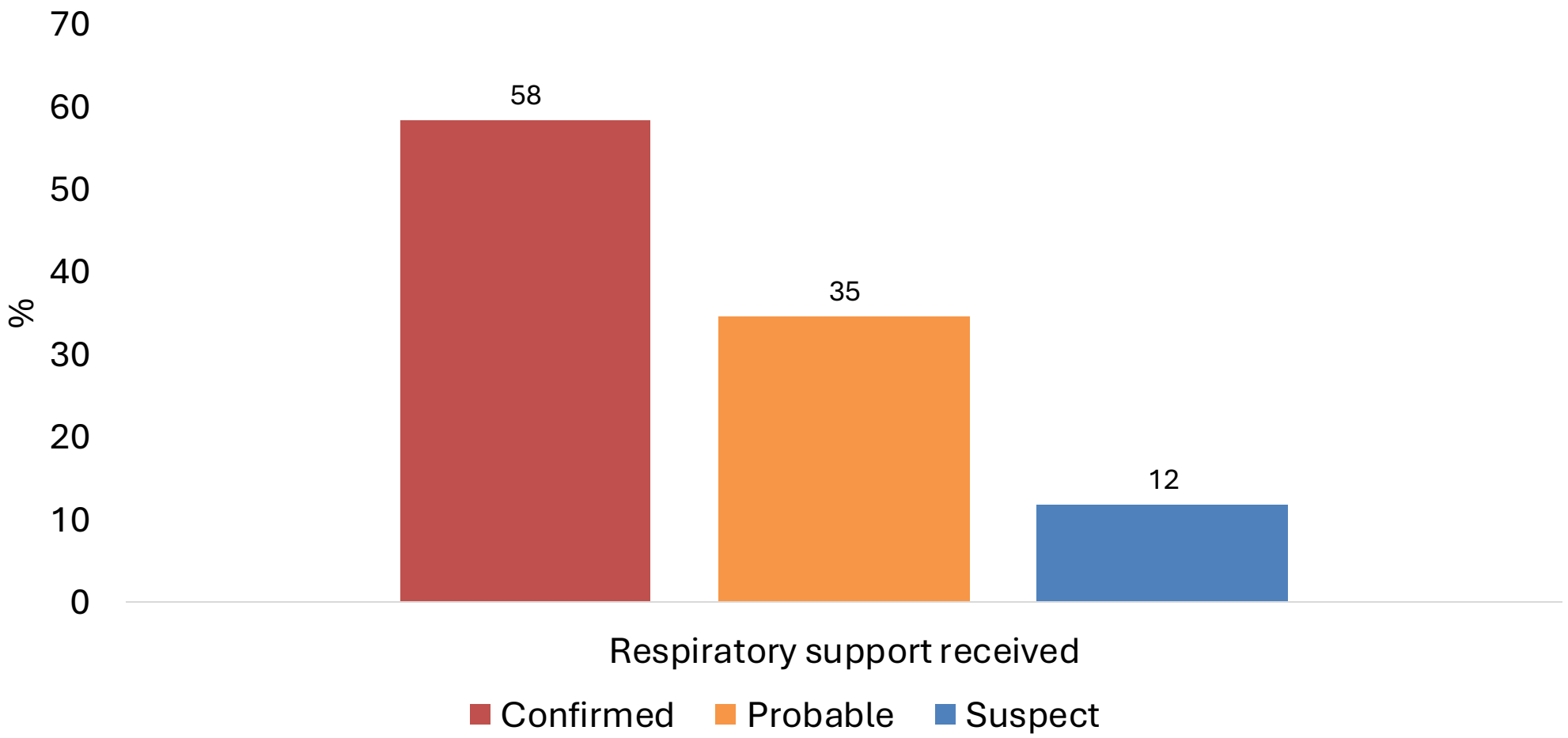
Confirmed cases had a higher percentage of hospital admission compared to probable and suspect cases.



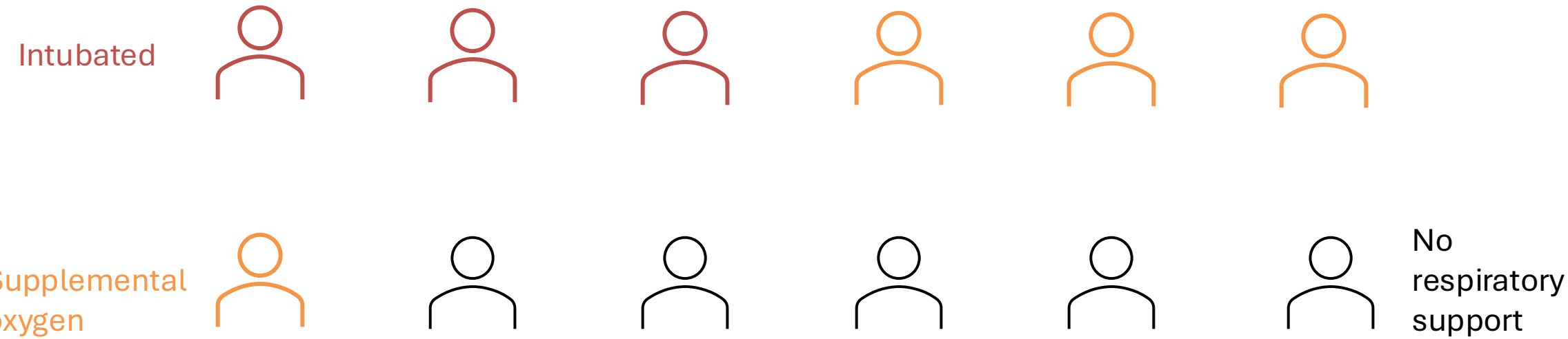
Among admitted cases, average length of stay among confirmed and probable cases was higher than suspect cases.



Confirmed cases were more likely to receive respiratory support than probable and suspect cases.

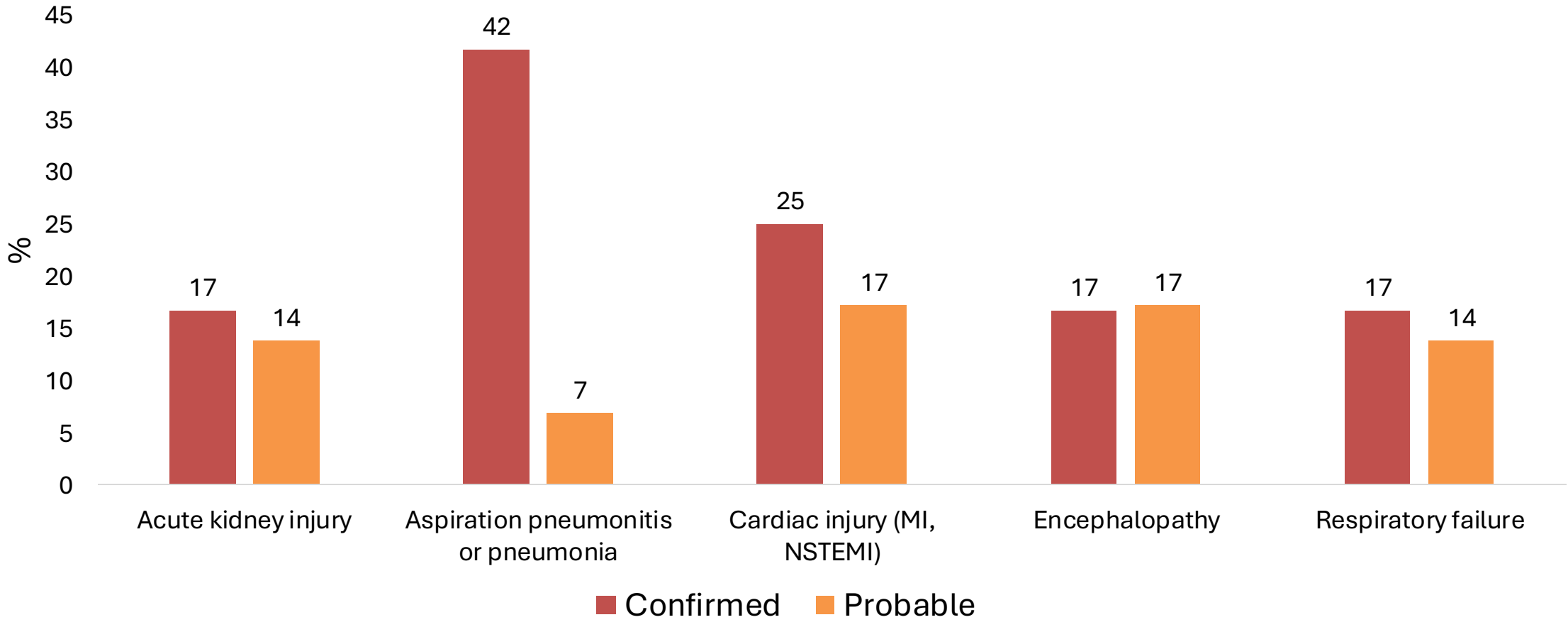


Among confirmed cases, 3 (25%) were intubated.



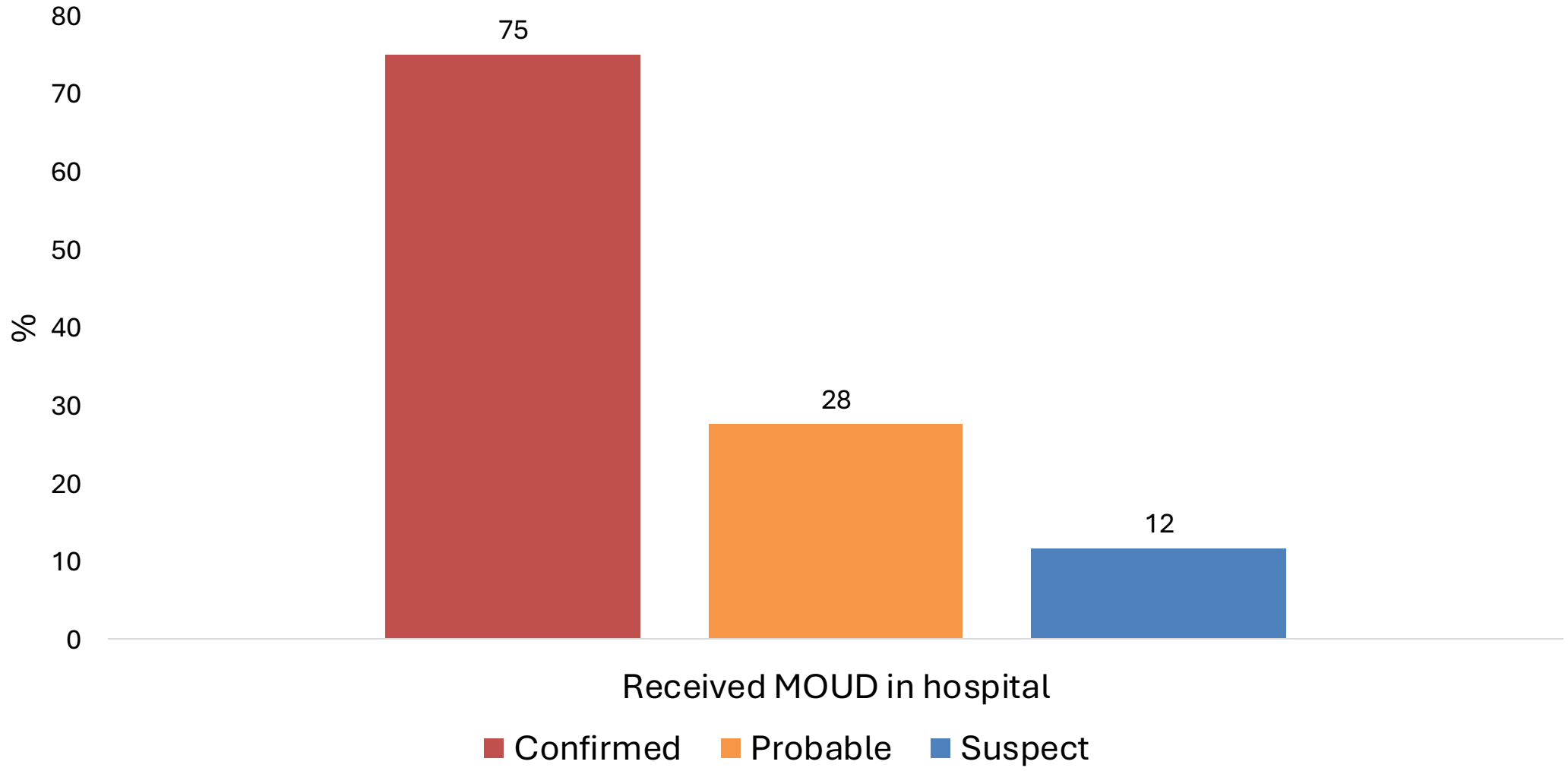
Median length of intubation (range): 1 day (1-2 days)

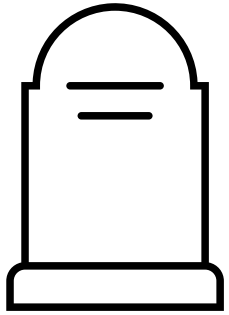
Confirmed cases experienced a high percentage of complications.



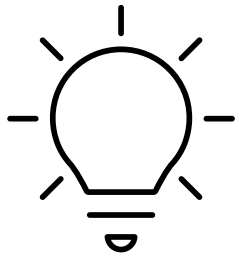
Suspect cases excluded from figure due to partial abstraction not including this information.

Most confirmed cases received MOUD in the hospital.





There were no deaths confirmed to be linked to medetomidine.

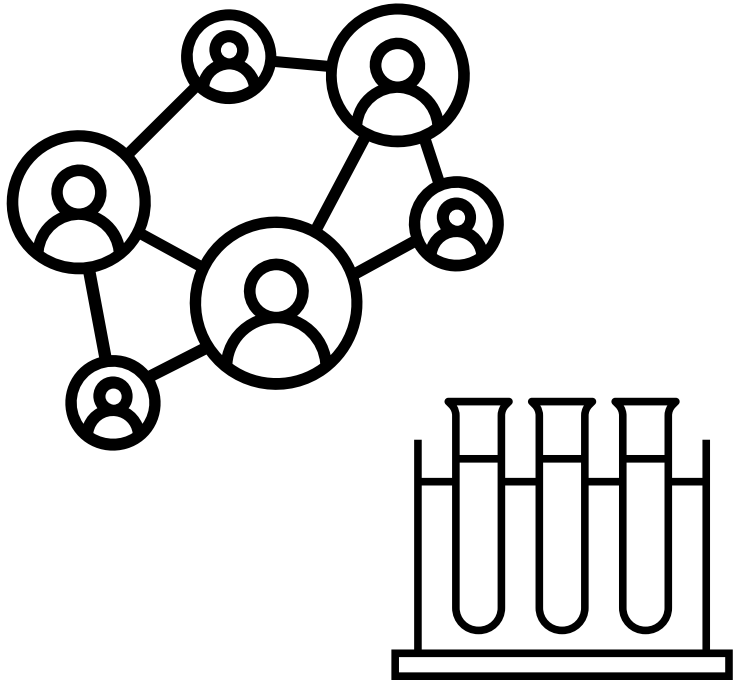


Objective 3: Provide public health recommendations for prevention.

Provide naloxone for suspected drug overdoses.

Provide naloxone for suspected drug overdoses.

Report overdose clusters and send biological samples for testing.

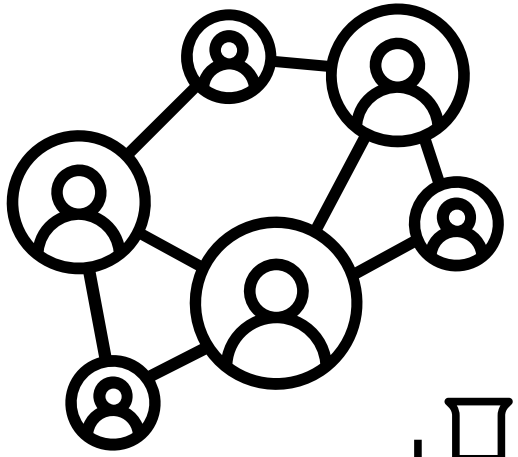


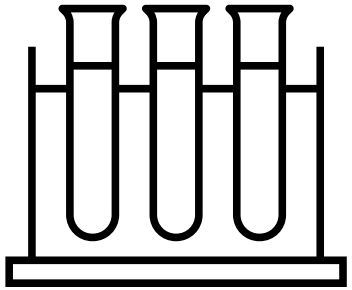
Report overdose clusters and send biological samples for testing.

Illinois Poison Center
POISON HELP
1•800•222•1222

Trusted poison information and advice, when you need it most.

The Illinois Poison Center's (IPC) toll-free, confidential 24-hour helpline is staffed by specially trained medical experts who provide comprehensive and trusted information and advice on potentially harmful substances.





Illinois Poison Center
POISON HELP
1-800-222-1222

833 W. Jackson Blvd
Suite 610
Chicago, IL 60607

312.906.6136
illinoispoisoncenter.org

DEA TOX PROGRAM FAQ
For Hospital Staff

What is the DEA TOX program?
The DEA TOX program provides surveillance on overdoses due to novel psychoactive substances (NPS) involved in the synthetic drug abuse epidemic. The Drug Enforcement Administration (DEA) has partnered with the University of San Francisco (UCSF) to test clinical samples from overdose patients across the nation. The clinical samples will undergo enhanced NPS analytical testing for wide variety of synthetic, semi-synthetic and prescription drugs.
It is difficult to identify novel synthetic drugs at most hospitals as most standard drug screens do not have the capability to test for the large variety of substances responsible for the synthetic drug epidemic. DEA TOX fills this gap and provides providers and public health with analytic information that would otherwise not be available.

Why should hospitals collaborate with the IPC and the DEA TOX program?
Synthetic drugs in communities change very rapidly and the ability to do expanded testing is not readily available in Illinois. By collaborating with IDPH and DEA TOX we can provide surveillance on new, novel drugs that cause injuries in the state. With this data, action plans can be developed including alerts and clinical education that can improve outcomes and reduce the harm from these products.

What types of clinical samples are accepted for testing?
Leftover samples from the time of presentation are sent to the UCSF lab for testing. Serum/Plasma and whole blood are preferred. In rare occasions, if serum/plasma or blood is unavailable, urine only may be accepted for testing. A minimum of 0.5 mL of plasma/serum, 1.0 mL of whole blood and 1.0 mL of urine is needed for testing of NPS in the specimens.

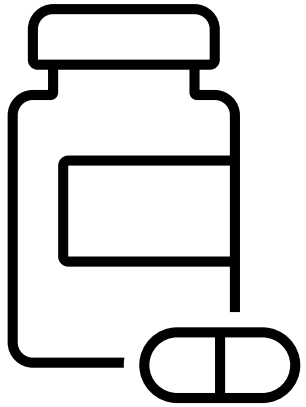
What is the cost of testing in the DEA TOX program?
The cost of the NPS testing is covered by the DEA TOX program. Shipping of the samples is covered by the hospital. If shipping is a hardship, IDPH may be able to pay for shipping, but this will delay arrival of the sample. If IDPH is needed to fund the shipping, the IPC staff will contact IDPH for pre-paid shipping labels (if available).

What is the procedure to have a sample sent for testing?
There is a protocol *DEA TOX Sample Collection and Shipping Protocol May 2021* that must be sent to the participating Illinois hospital. It contains the instructions on how and where to send the leftover clinical samples. All samples will be de-identified per the DEA Shipping Protocol.

How is the DEA TOX sample submission process initiated?
A synthetic drug or NPS exposure must first be suspected, either by patient history of NPS ingestion/inhalation or parenteral use OR presentations that do not fit a clear toxidrome (e.g. opioid appearance, but no response to naloxone). Once a potential synthetic drug exposure is suspected, the DEA TOX submission process can be started.

When do results come back for specimens sent to DEA TOX?
Specimen results will come back within 3 weeks after receipt of the sample at UCSF. The IPC will need the email of the treating provider or lab staff to return the DEA TOX results to.

Provide MOUD.



Provide MOUD.

HELP IS HERE. NOW.

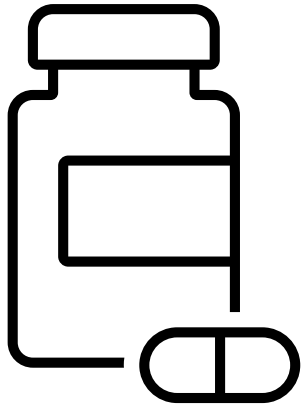
MAR NOW is a new service that connects you directly to a provider for opioid use disorder treatment.

Call the IL Helpline 833-234-6343 24/7 and ask for MAR NOW. You can receive medication over the phone, or a same-day appointment for treatment.

MAR (Medication assisted recovery) is a safe and effective treatment for opioid use disorder. If you have problems with heroin, fentanyl, or other opioid use, MAR can help.

MAR NOW is ***available to all Chicagoans,*** regardless of ability to pay, insurance status, or documentation.

Overdose is preventable.



Acknowledgments

CDPH
Chicago Department of Public Health

THANK YOU!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