CO Poisoning Surveillance in Kansas

LT Alexa Schappert, DVM, MPH | July 30, 2024

Kansas Department of Health and Environment
Division of Public Health

Surveillance is a systematic way to collect, analyze, and interpret health data.

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It involves data collection, monitoring, management, and analysis.

There are two forms of surveillance.

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Passive surveillance uses information shared by health care facilities.

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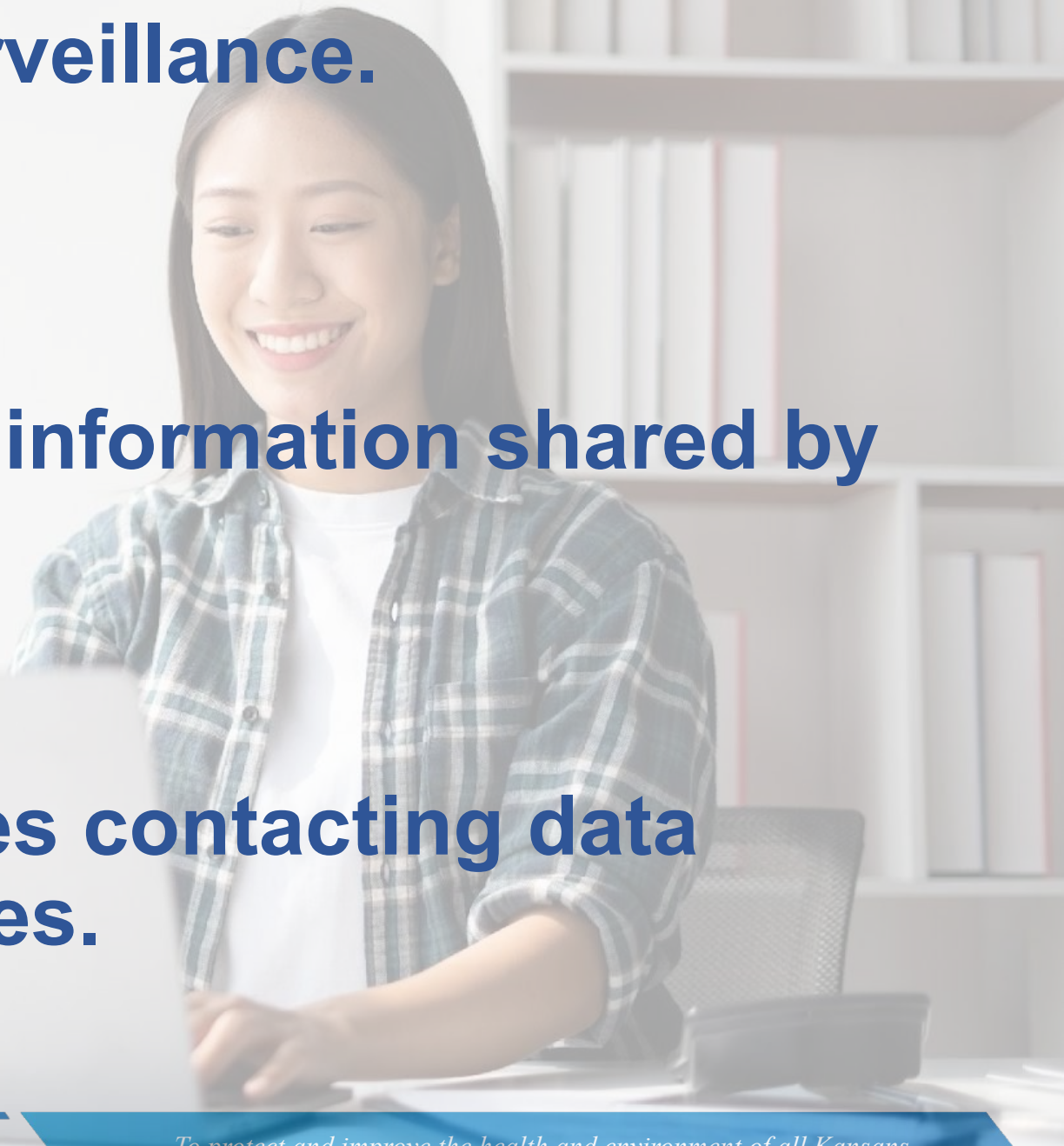
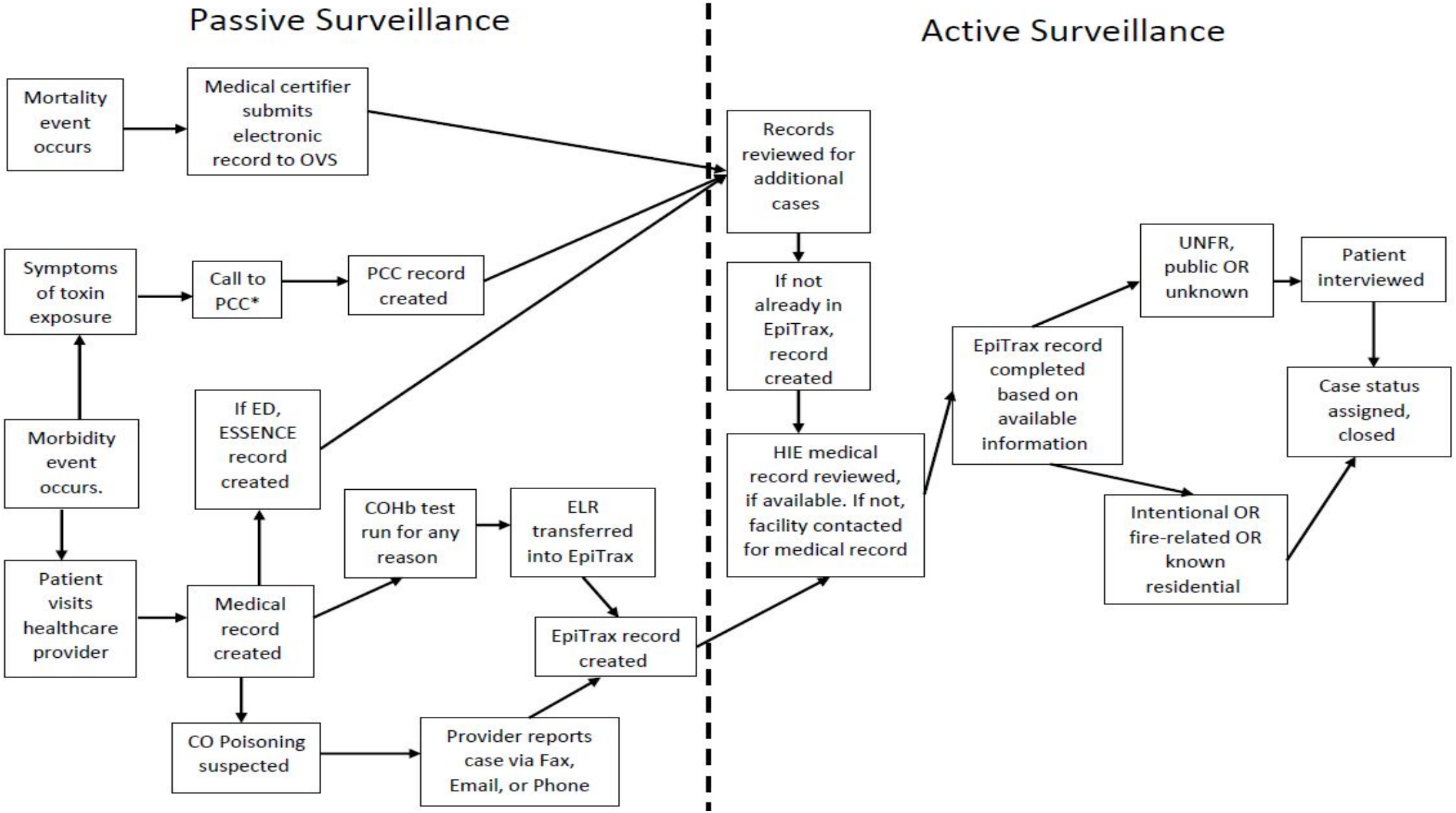
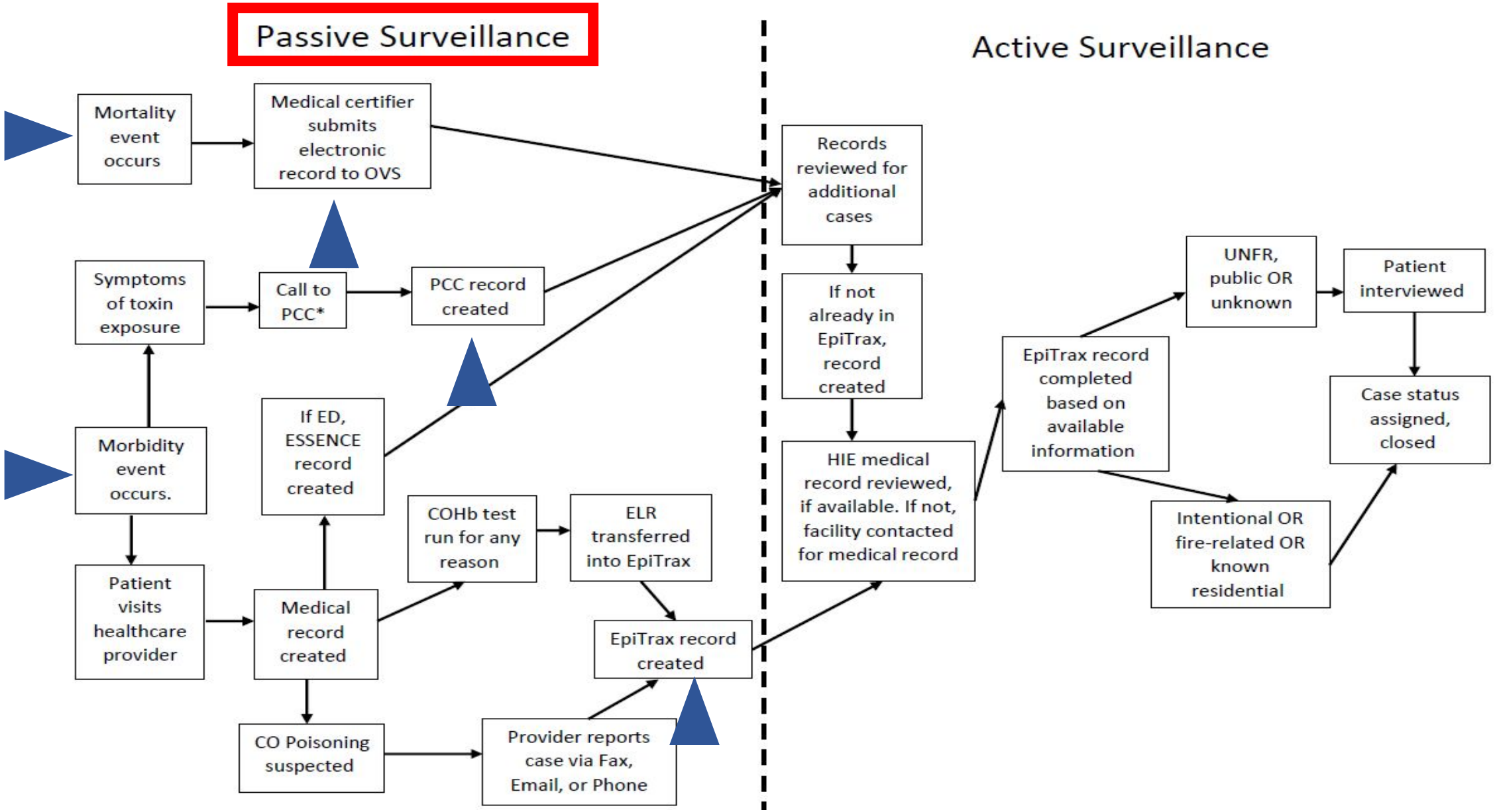
Active surveillance requires contacting data sources for additional cases.




Passive Surveillance
Active Surveillance
Mortality event occurs
Medical certifier submits electronic record to OVS
Symptoms of toxin exposure
Call to PCC*
PCC record created
Morbidity event occurs.
If ED, ESSENCE record created
Patient visits healthcare provider
Medical record created
COHb test run for any reason
ELR transferred into EpiTrax
EpiTrax record created
CO Poisoning suspected
Provider reports case via Fax, Email, or Phone
Records reviewed for additional cases
If not already in EpiTrax, record created
HIE medical record reviewed, if available. If not, facility contacted for medical record
EpiTrax record completed based on available information
UNFR, public OR unknown
Patient interviewed
Case status assigned, closed
Intentional OR fire-related OR known residential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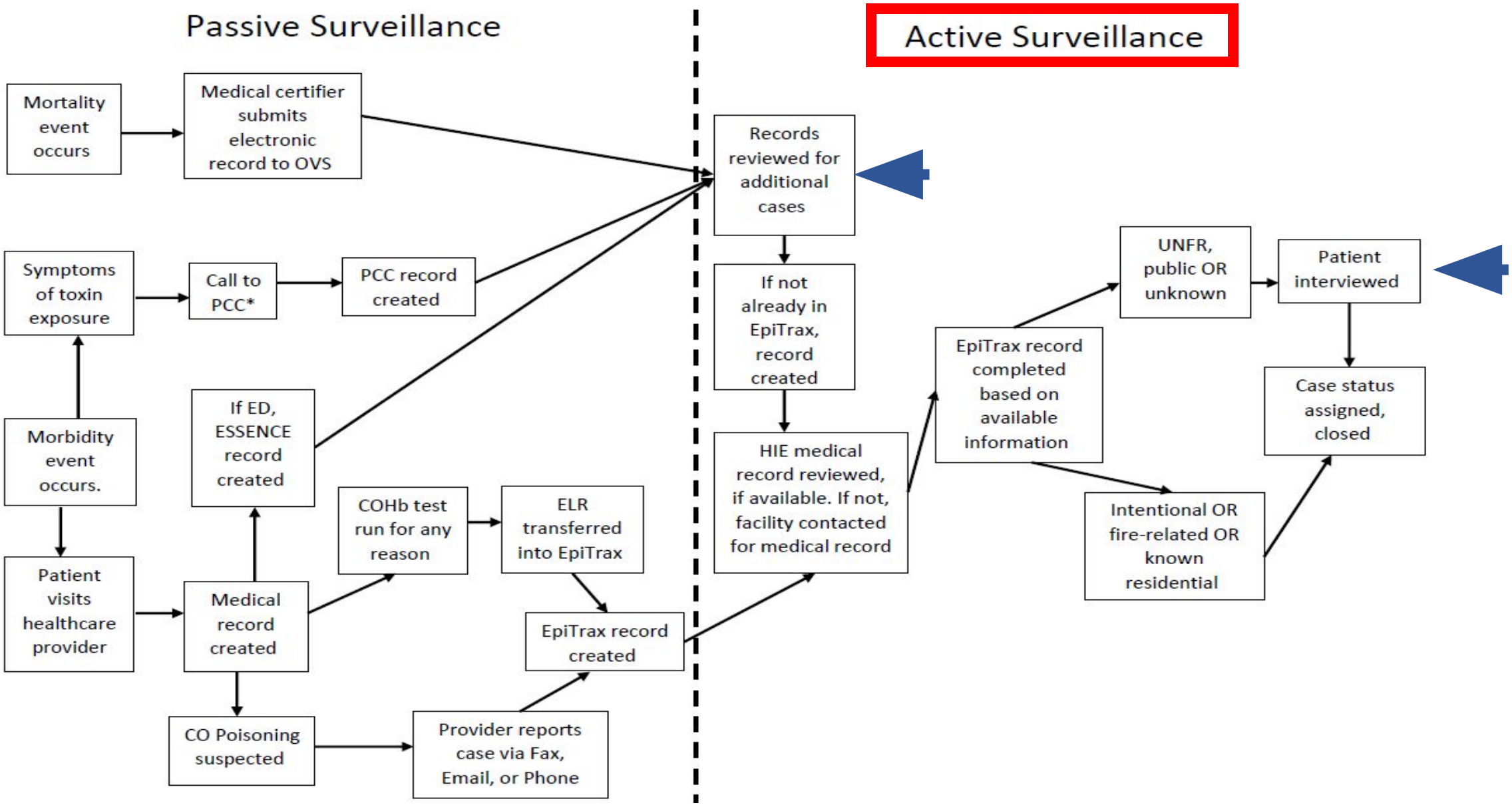
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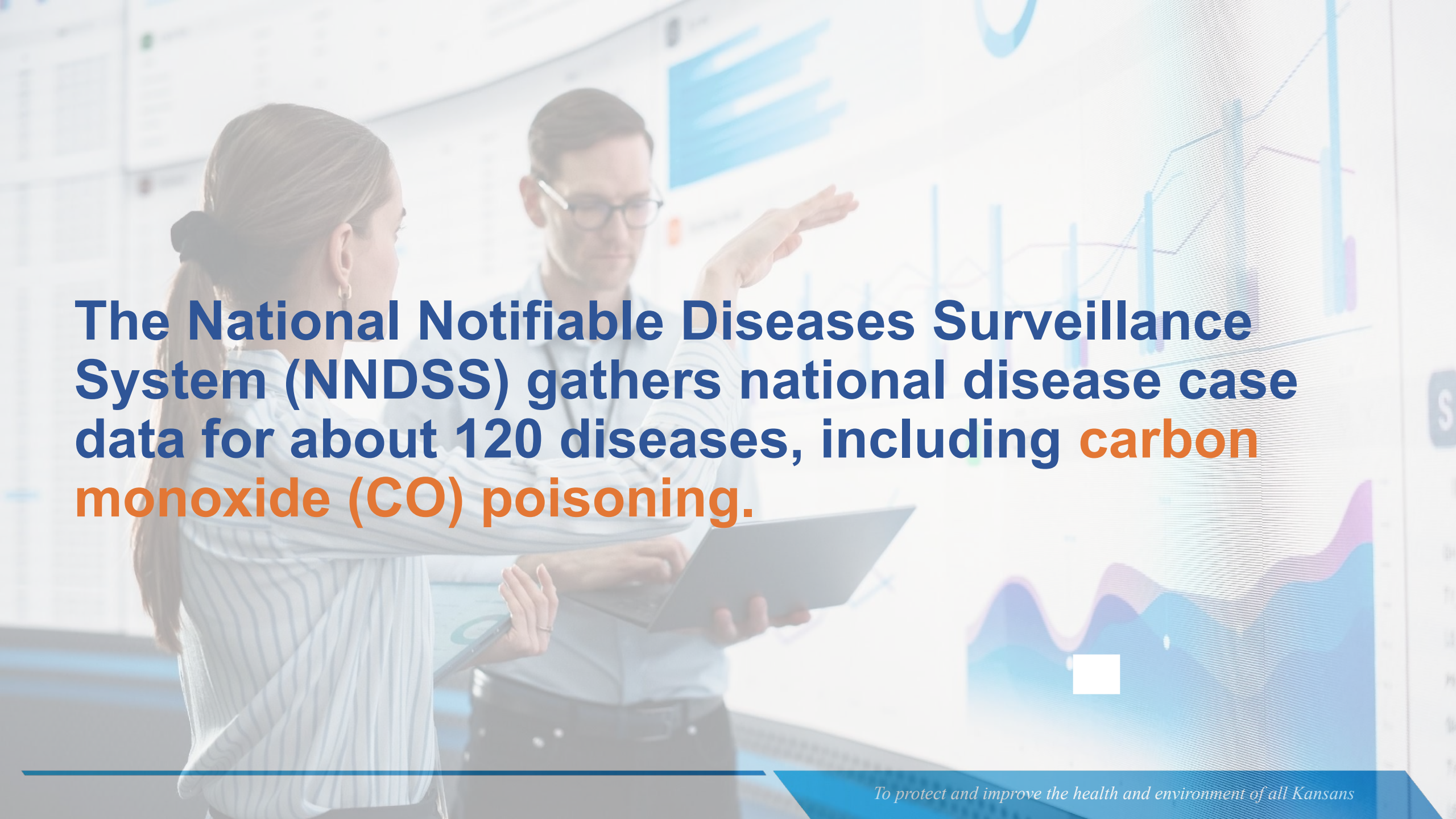
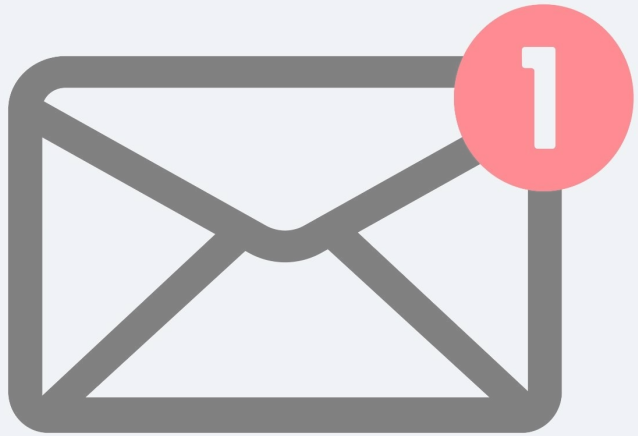
Surveillance guides public health decisions.



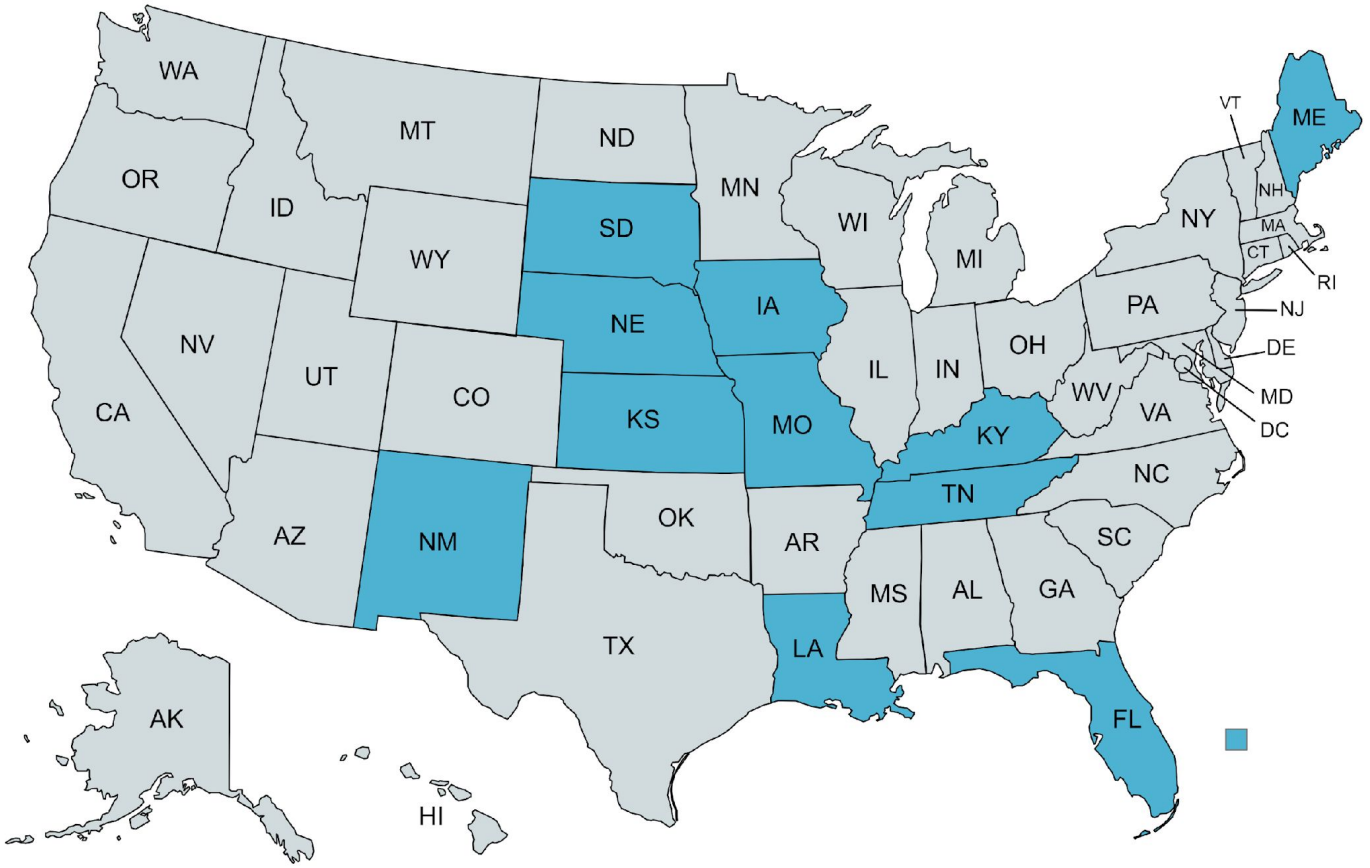
The National Notifiable Diseases Surveillance System (NNDSS) gathers national disease case data for about 120 diseases, including carbon monoxide (CO) poisoning.

Nationally notifiable diseases are voluntarily reported to CDC by states and territories.

CO poisoning has been a nationally notifiable condition since 2014.



Kansas mandated CO poisoning reporting on May 11, 2018, making it 1 of 11 states that mandate reporting of CO poisoning.



Created with mapchart.net

CO poisoning surveillance has many purposes.

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Understand health effects

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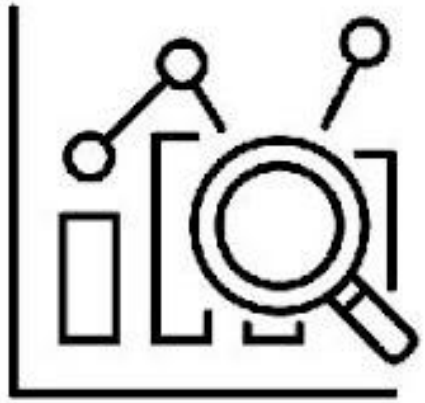
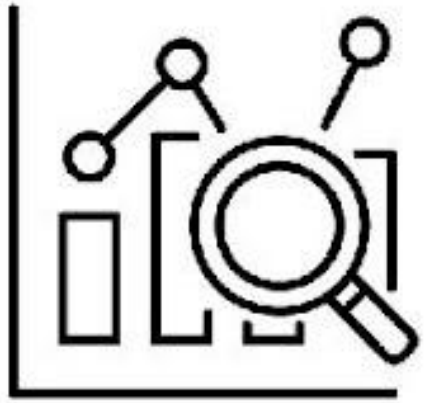


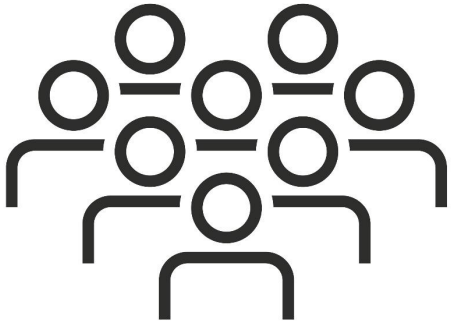
Monitor trends

CO poisoning surveillance has many purposes.

Understand health effects



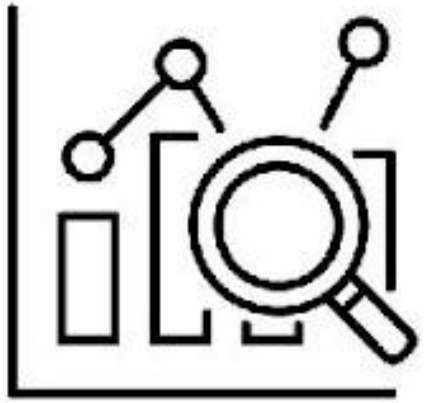
Monitor trends



Identify high-risk groups

CO poisoning surveillance has many purposes.

Understand health effects



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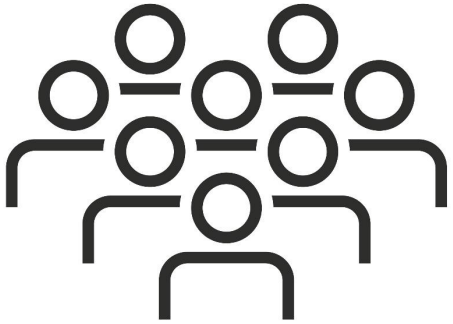


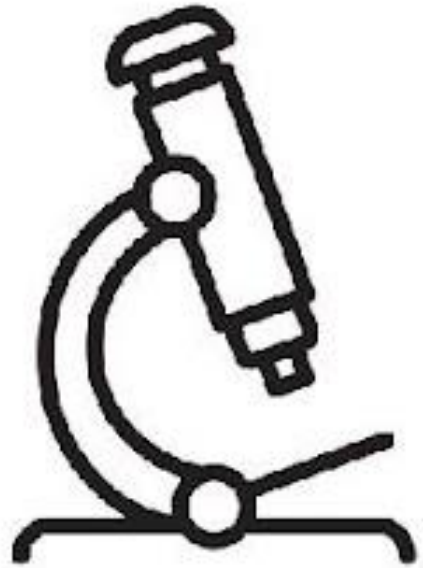
Identify high-risk groups

Determine policy impacts

In Kansas, we focus on unintentional, non-fire related CO poisonings that occur in public settings.

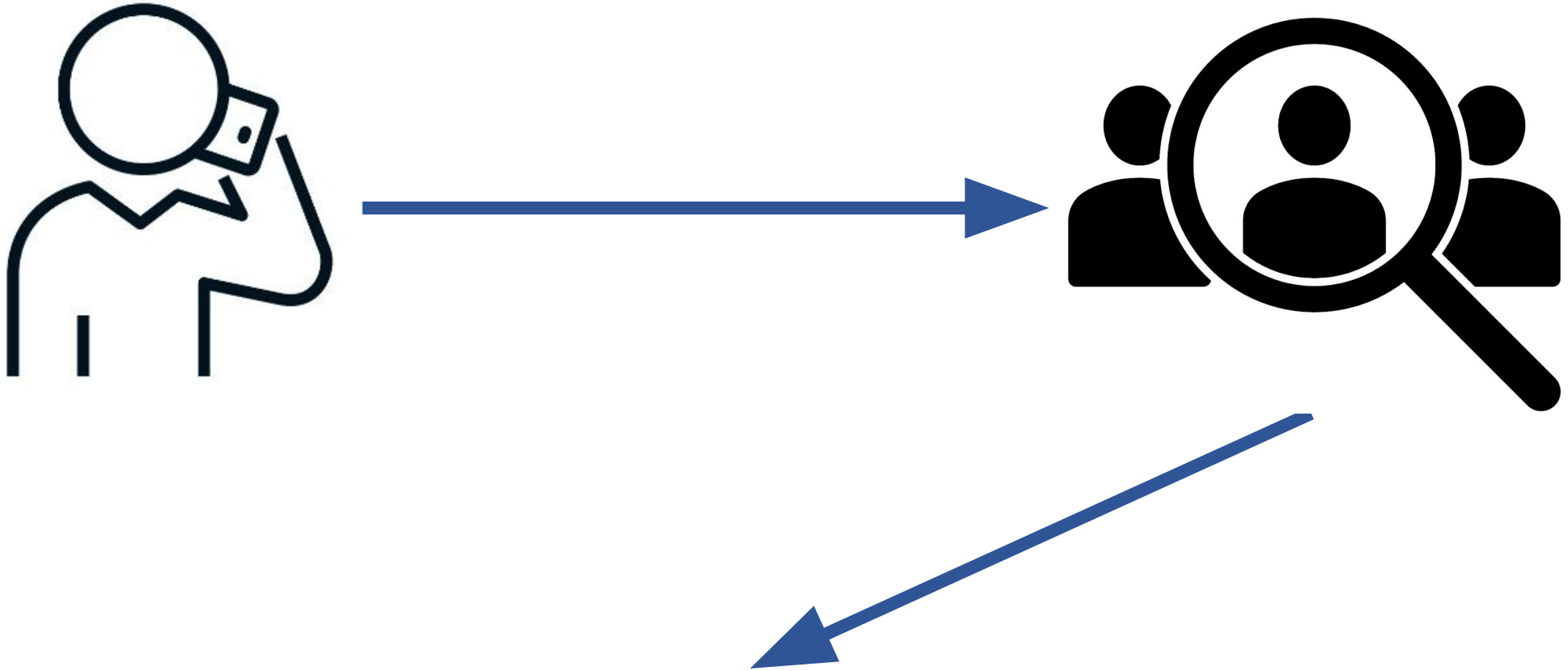
We improve the data we receive by requiring disease reporting.

Mandatory reporters include healthcare providers and laboratories.



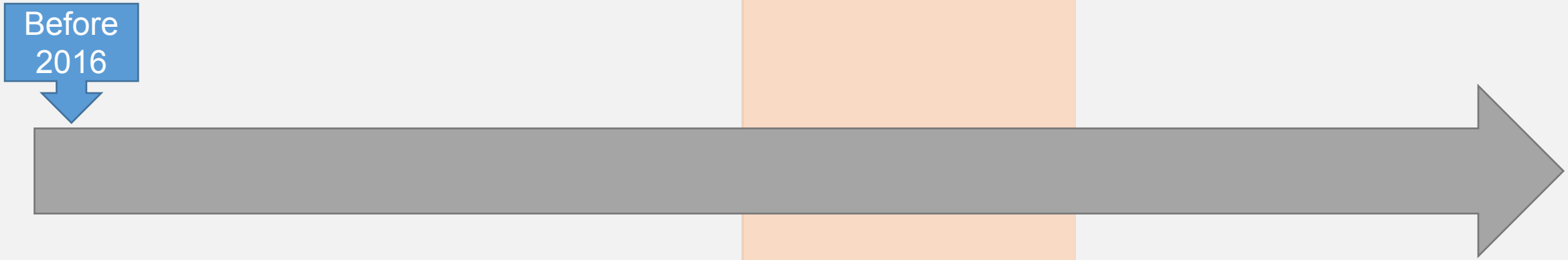
Mandatory reporters report cases within 24 hours.

Identifiable data are collected.

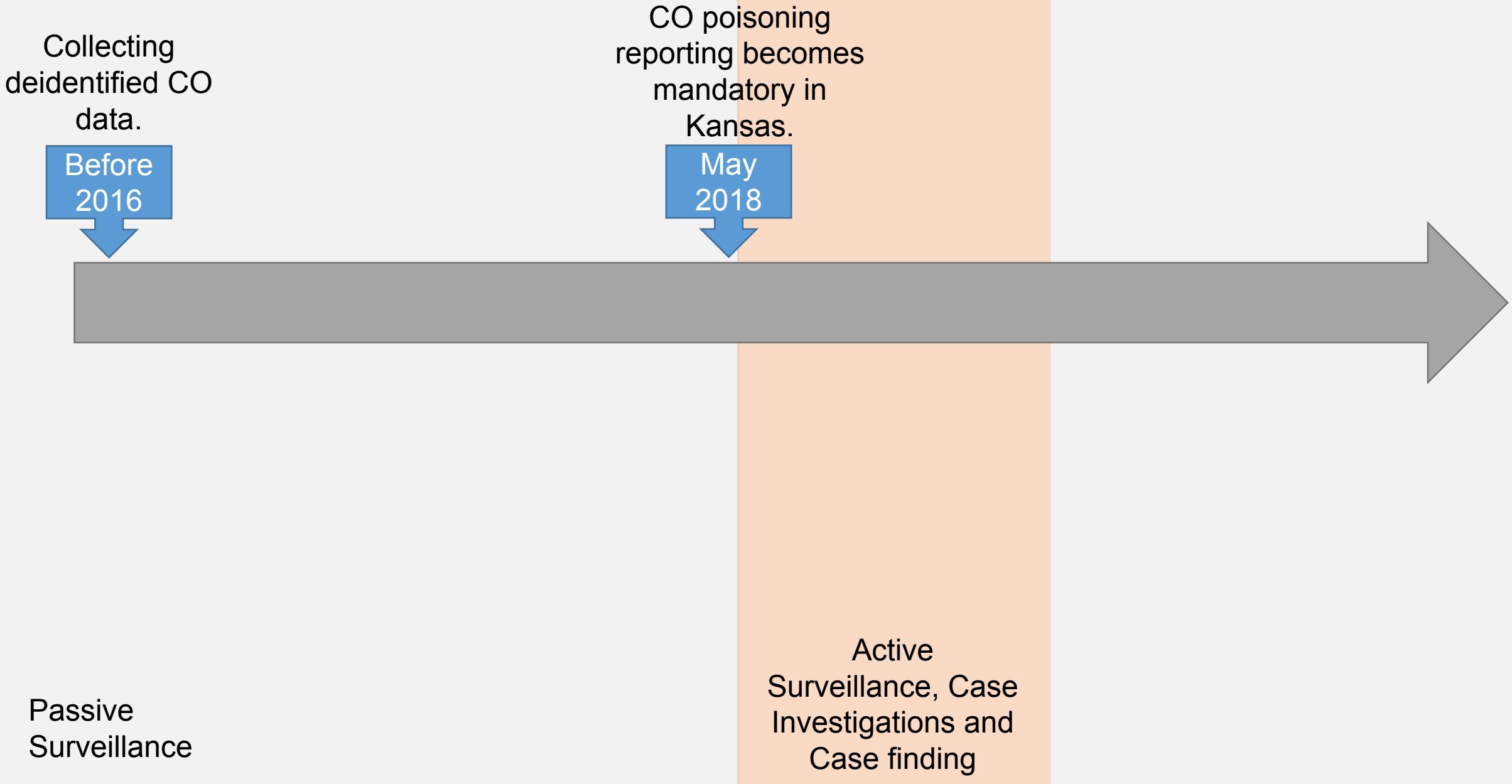


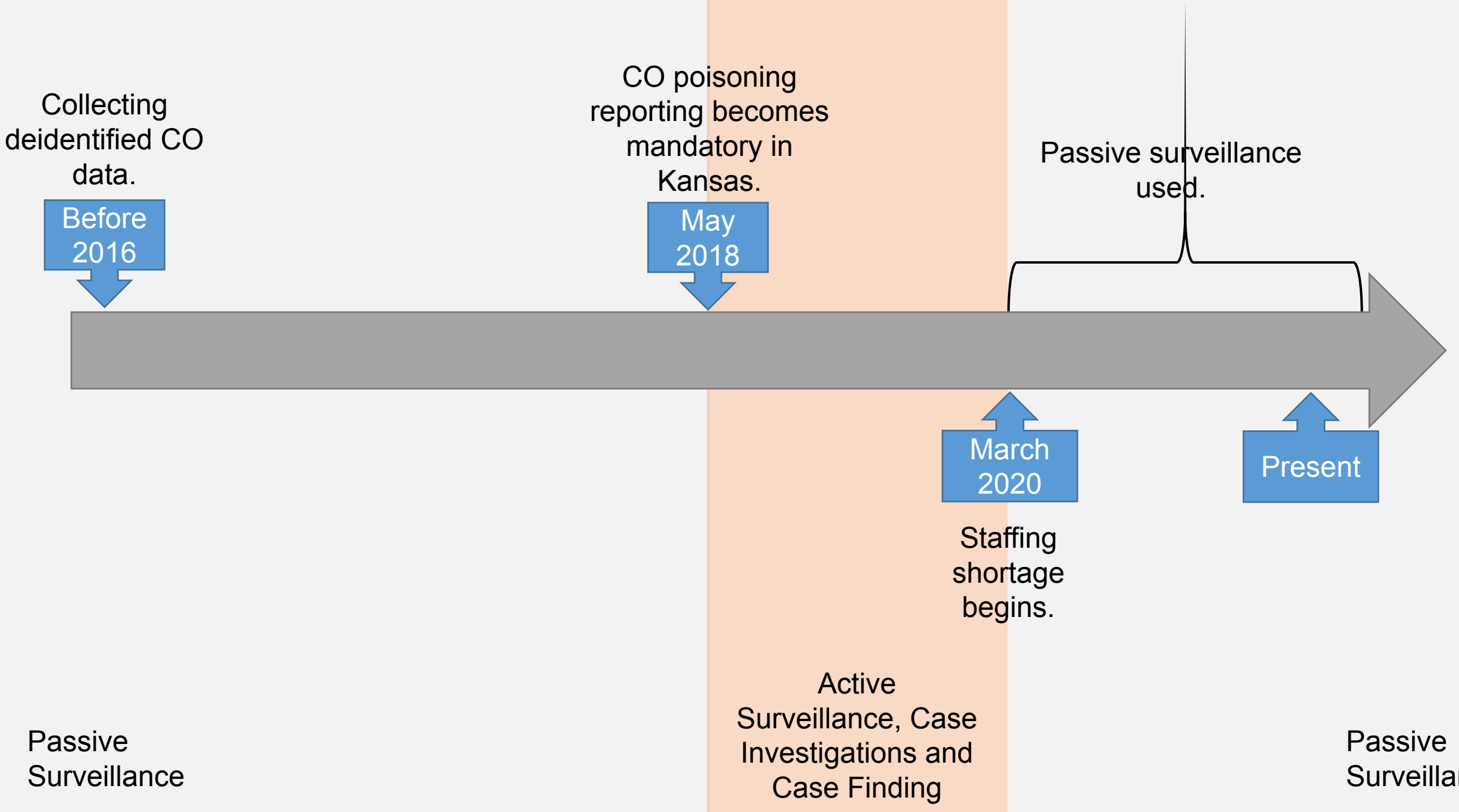
Active surveillance can occur.

Collecting deidentified CO data.

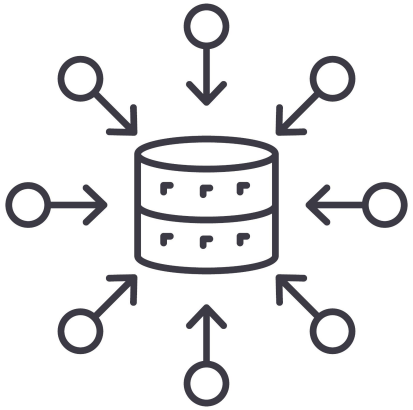


Passive Surveillance

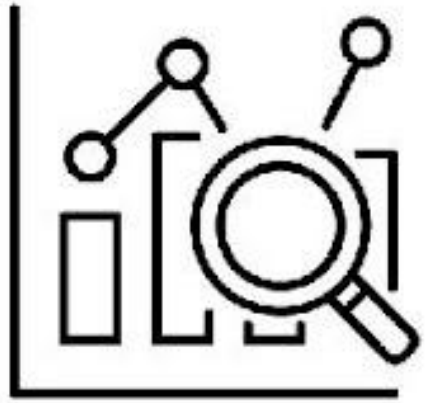

Collecting deidentified CO data.
Before 2016
CO poisoning reporting becomes mandatory in Kansas.
May 2018
Passive Surveillance
Active Surveillance, Case Investigations and Case finding


Collecting deidentified CO data.
Before 2016
CO poisoning reporting becomes mandatory in Kansas.
May 2018
Passive surveillance used.
March 2020
Staffing shortage begins.
Present
Passive Surveillance
Active Surveillance, Case Investigations and Case Finding
Passive Surveillance

Passive surveillance collects information shared by health care facilities.



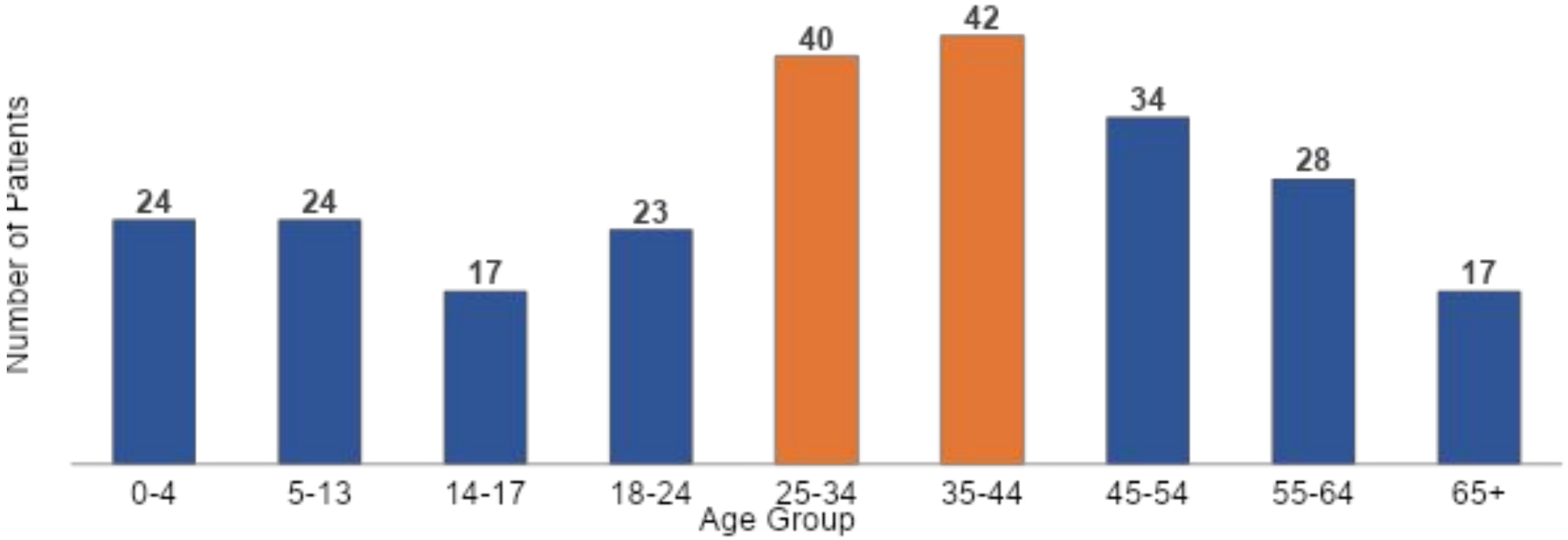
Aggregates data



Tracks trends

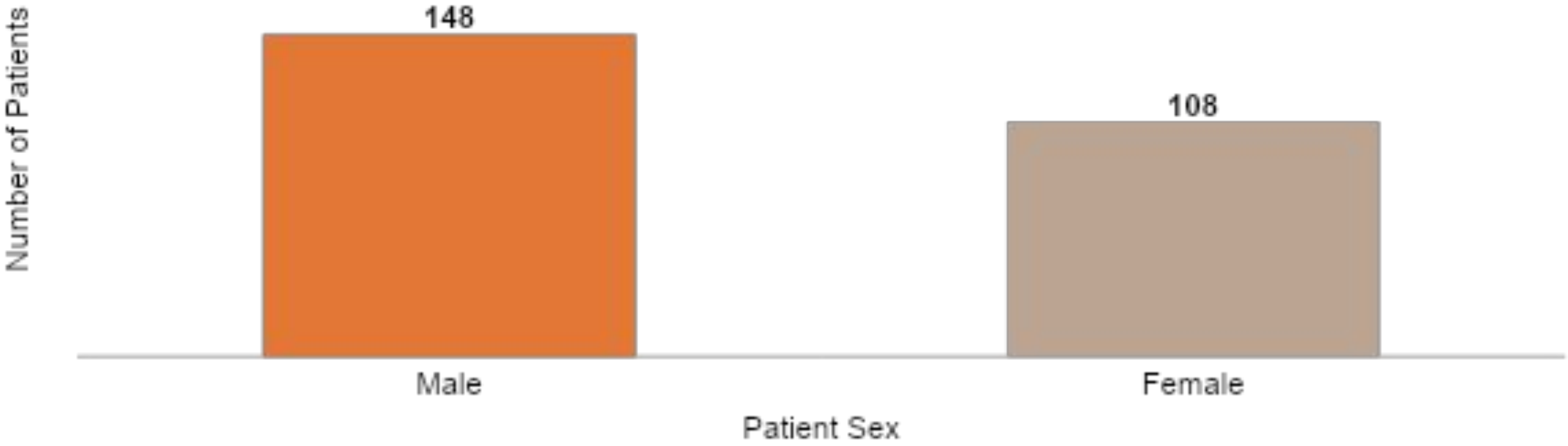
Passive surveillance data includes demographic information.

From May 2018-March 2020 in Kansas, more adults aged 25-44 visited the emergency department for CO poisoning.



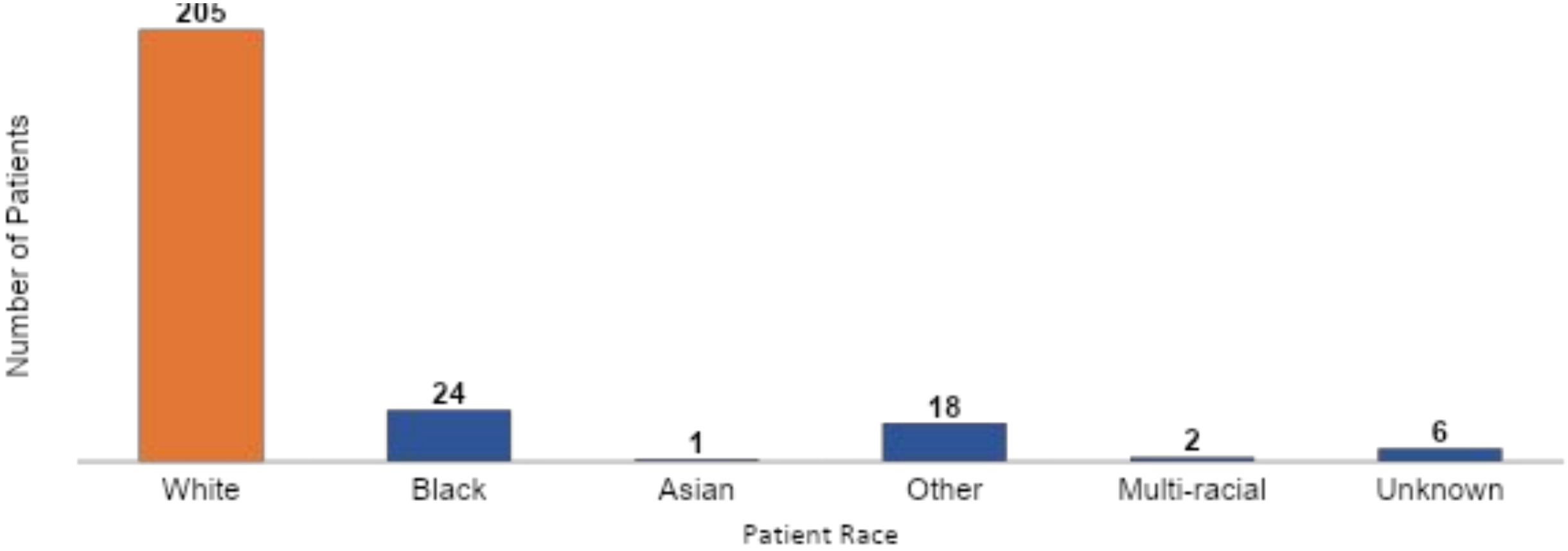
Data Source: Kansas Hospital Association Emergency Department Visit data

From May 2018-March 2020 in Kansas, more males than females visited the emergency department for CO poisoning.



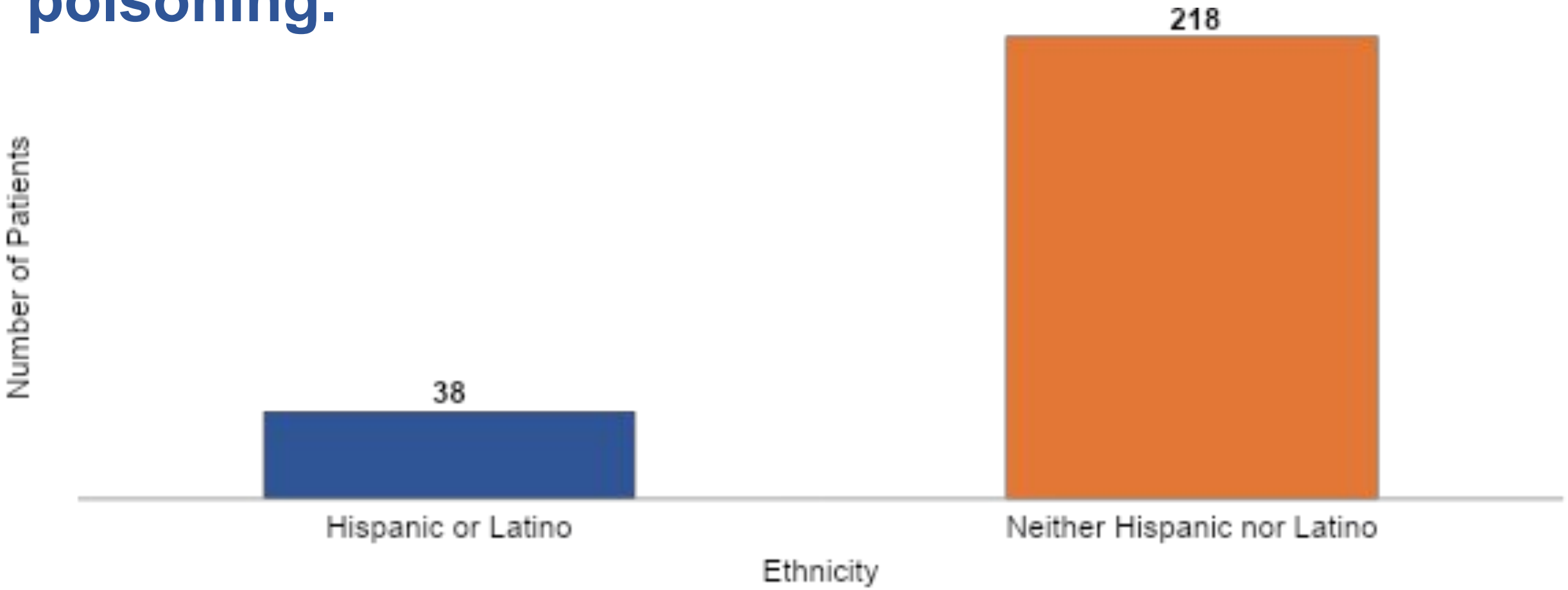
Data Source: Kansas Hospital Association Emergency Department Visit data

From May 2018-March 2020 in Kansas, more patients who identified as White visited the emergency department for CO poisoning.



Data Source: Kansas Hospital Association Emergency Department Visit data

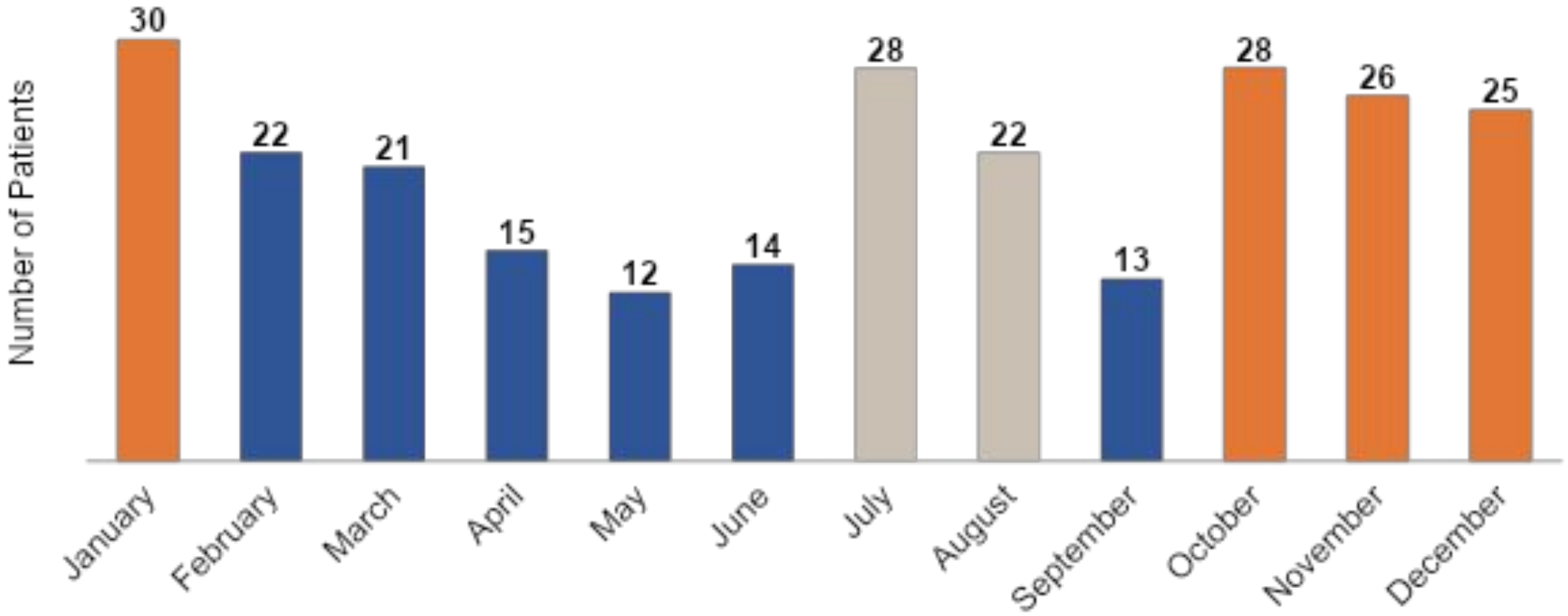
From May 2018-March 2020 in Kansas, more patients who identified as neither Hispanic nor Latino visited the emergency department for CO poisoning.



Data Source: Kansas Hospital Association Emergency Department Visit data

Passive Surveillance data showed that White, non-Hispanic or Latino males between the ages of 25 and 44 were the demographic most affected by CO poisoning from May 2018-March 2020.

CO poisoning emergency department visits increased from October-January and July-August.



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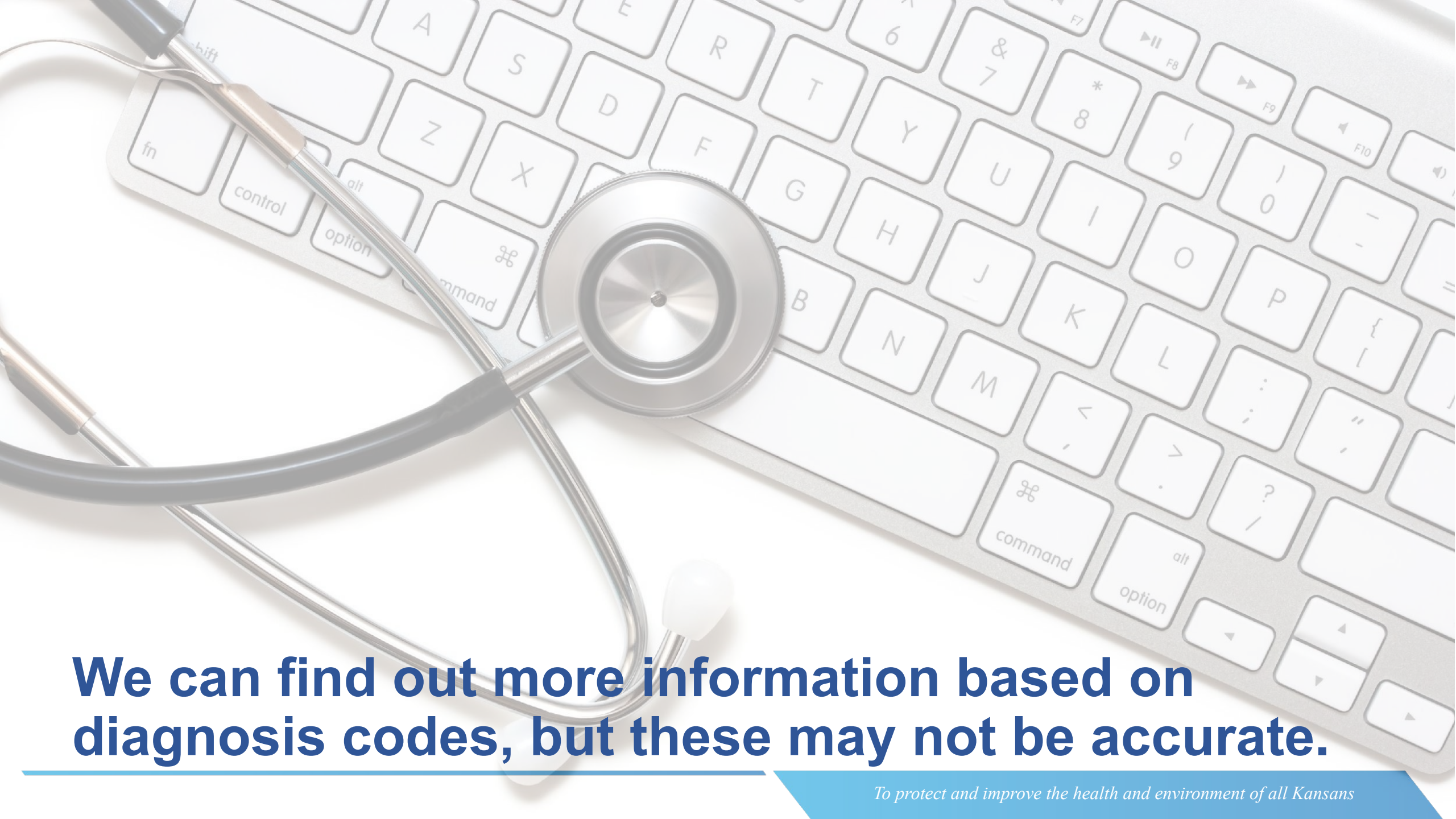
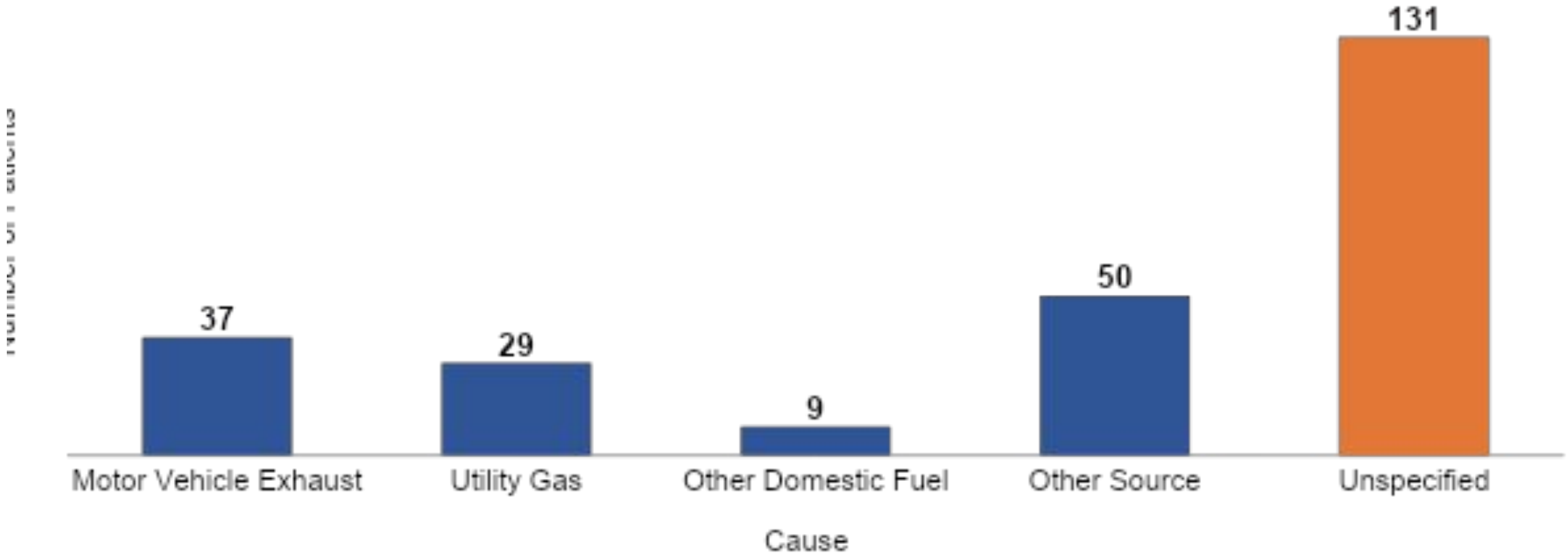


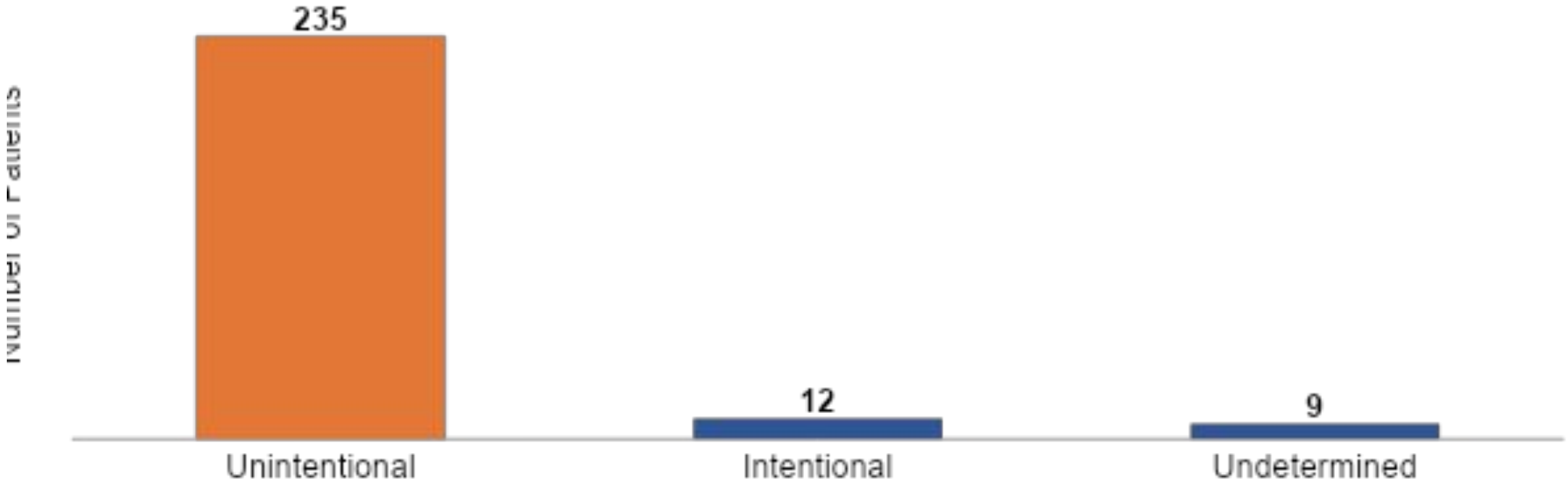
We can find out more information based on diagnosis codes, but these may not be accurate.

Most CO poisoning emergency department visits from May 2018-March 2020 in Kansas had an unspecified cause.



Data Source: Kansas Hospital Association Emergency Department Visit data

Most CO poisoning emergency department visits from May 2018-March 2020 in Kansas were unintentional.



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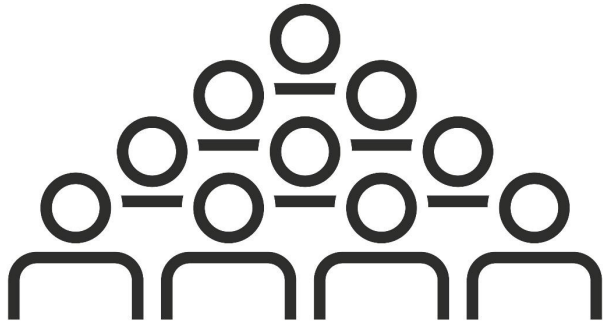
Use of passive surveillance only has several disadvantages.



Generalized information

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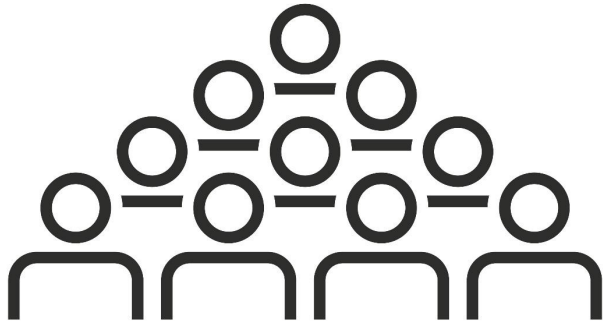

Generalized information

+

Not timely

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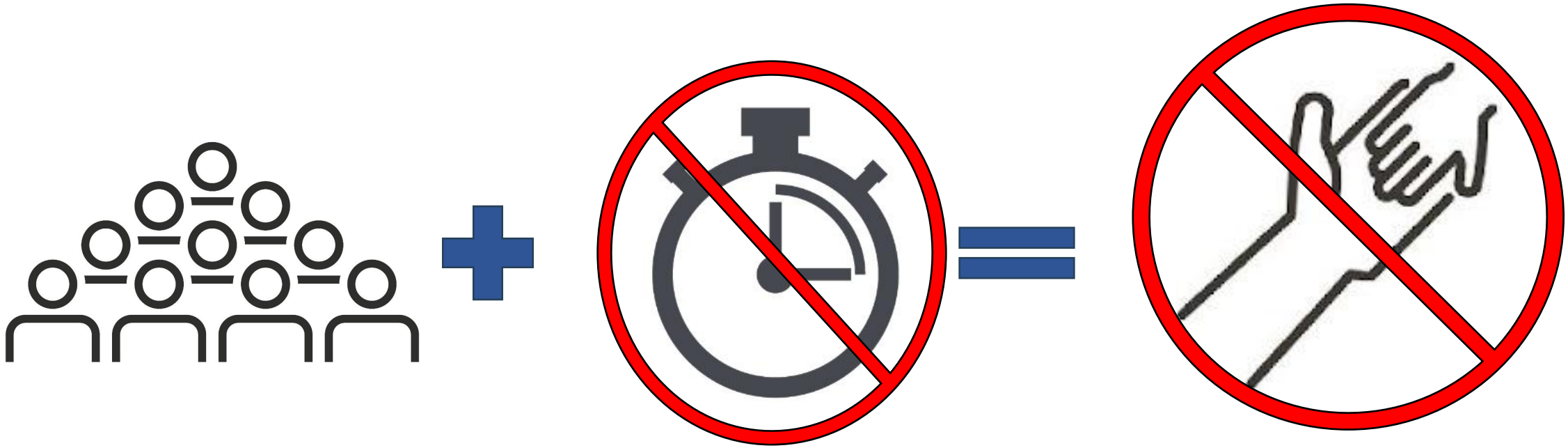

Generalized information

Not timely

Result: No specific interventions

Passive surveillance using aggregate data gives information that can be useful but is not specific.

Active surveillance gathers more specific information.

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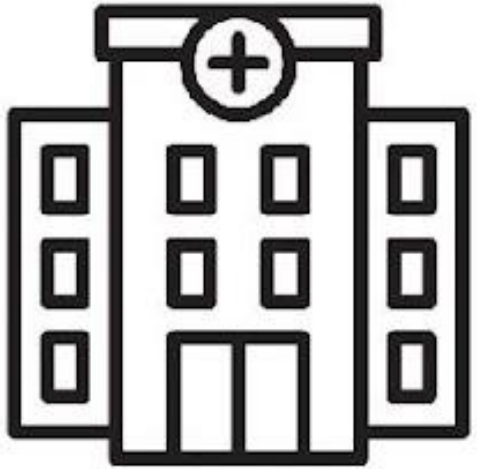
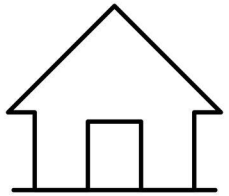


Health care facilities contacted

Medical records reviewed

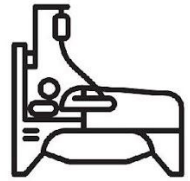
Patients interviewed

Active surveillance gathers more specific information.



Location

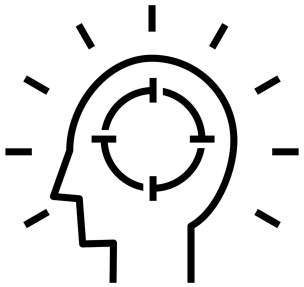
Others exposed



Symptoms experienced

Treatments given

Potential cause



Intention

Closed cases had their medical record reviewed, were interviewed, and met our case definition.

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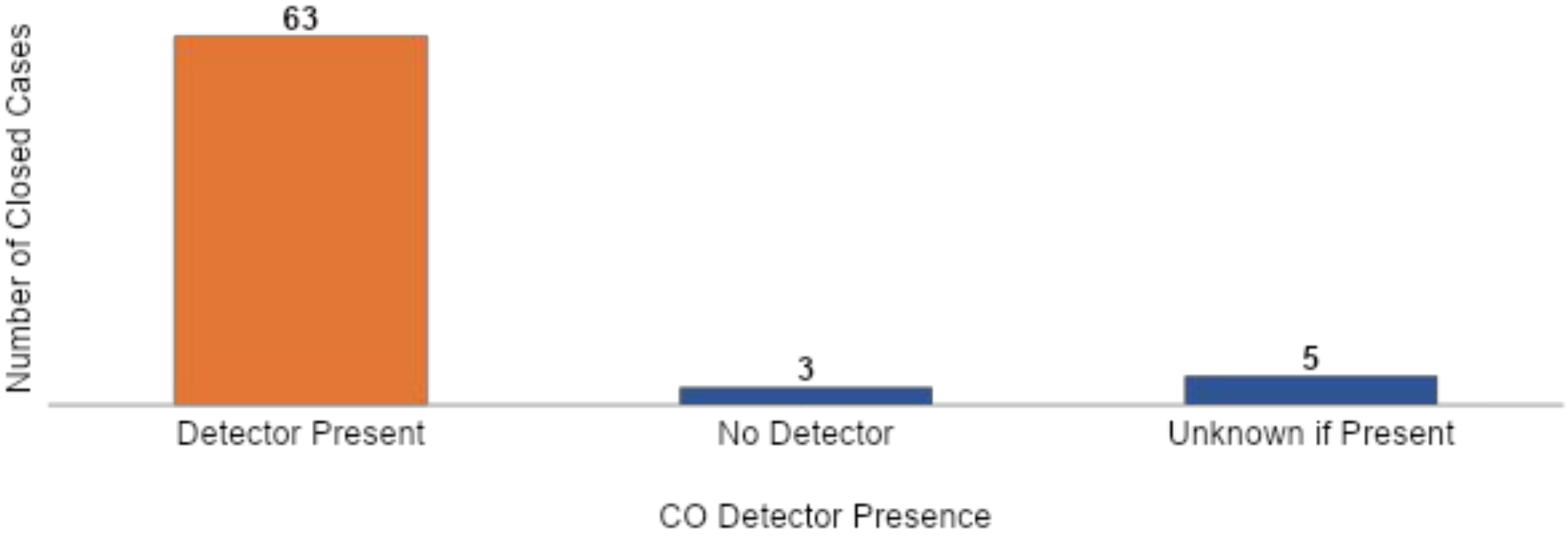
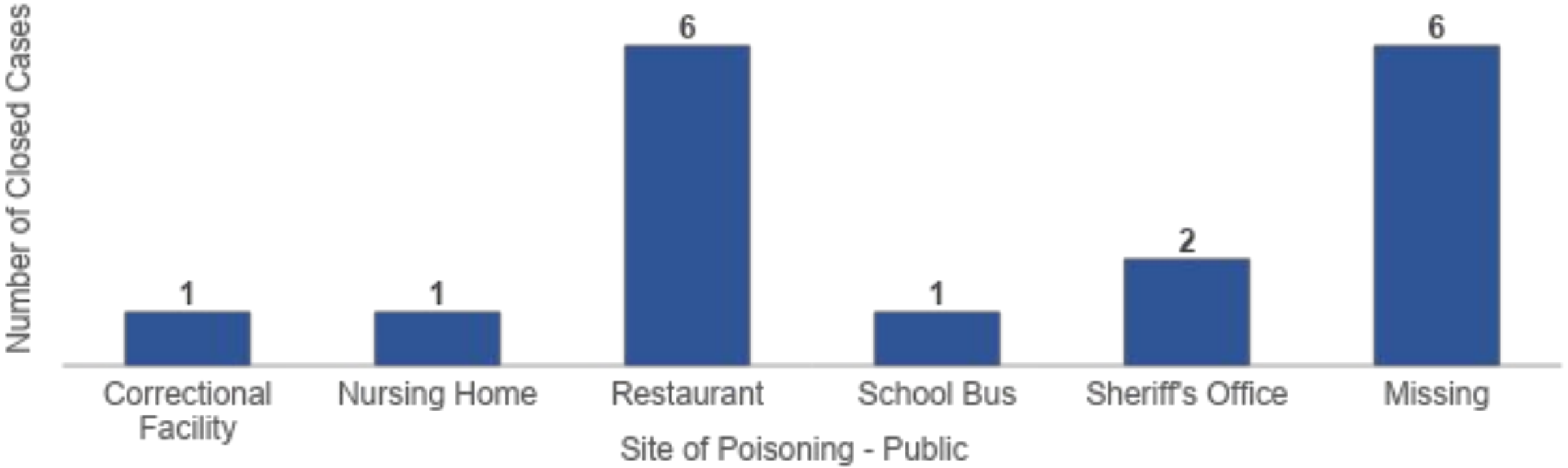
71 cases met our case definition.

Most cases from May 2018-March 2020 had a CO detector present at the time of the poisoning.



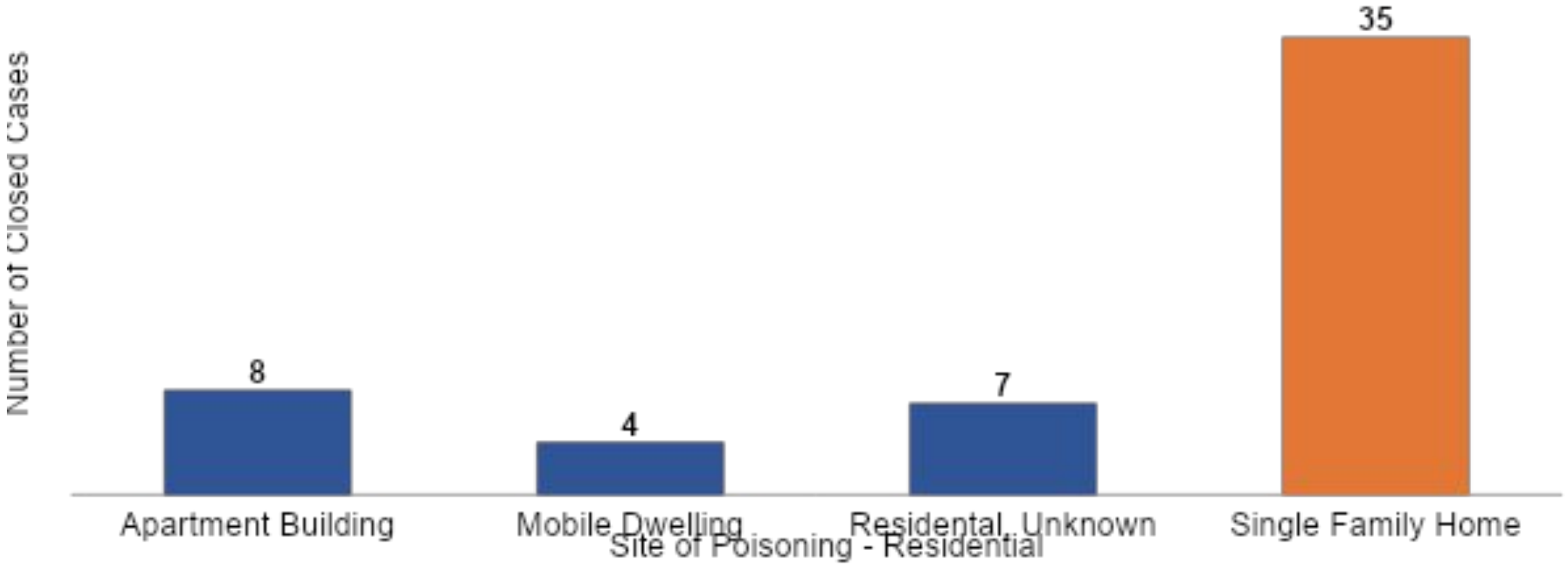
Data Source: EpiTrax Case Data

Cases from May 2018-March 2020 happened in multiple public locations.



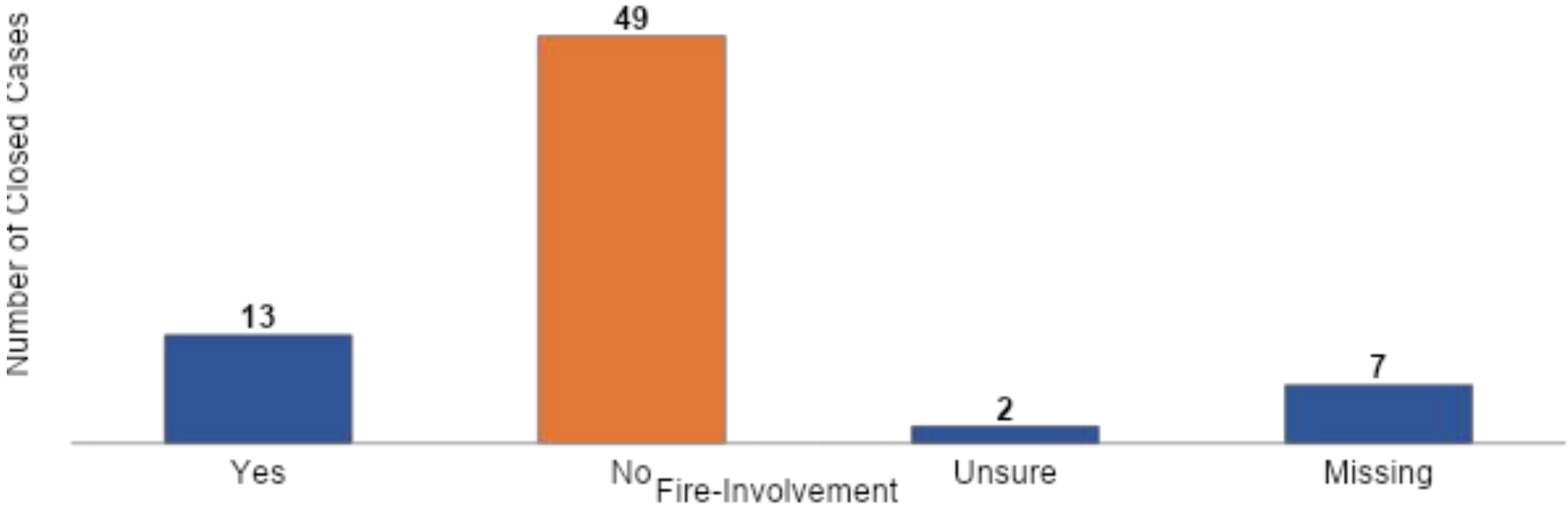
Data Source: EpiTrax Case Data

Most cases from May 2018-March 2020 in a private residence were in a single-family home.



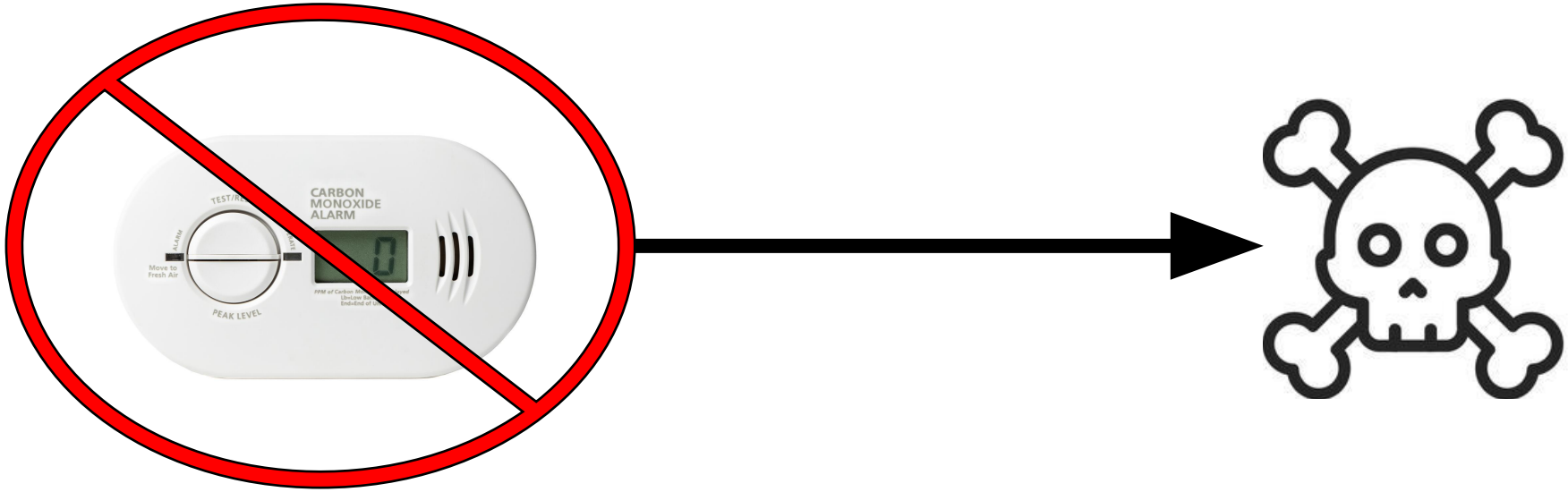
Data Source: EpiTrax Case Data

Most cases from May 2018-March 2020 did not involve fire.



Data Source: EpiTrax Case Data

The more specific information from active surveillance helps guide prevention efforts more than passive surveillance.


CARBON
MONOXIDE
ALARM
TEST/M
ALARM
Move to
Fresh Air
PEAK LEVEL
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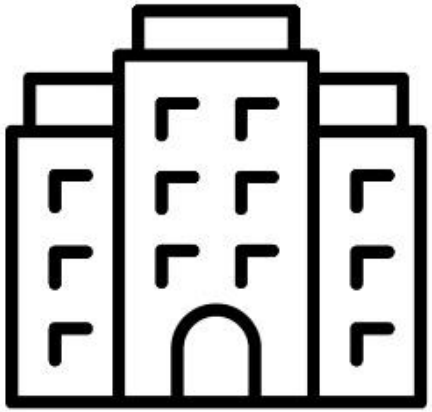
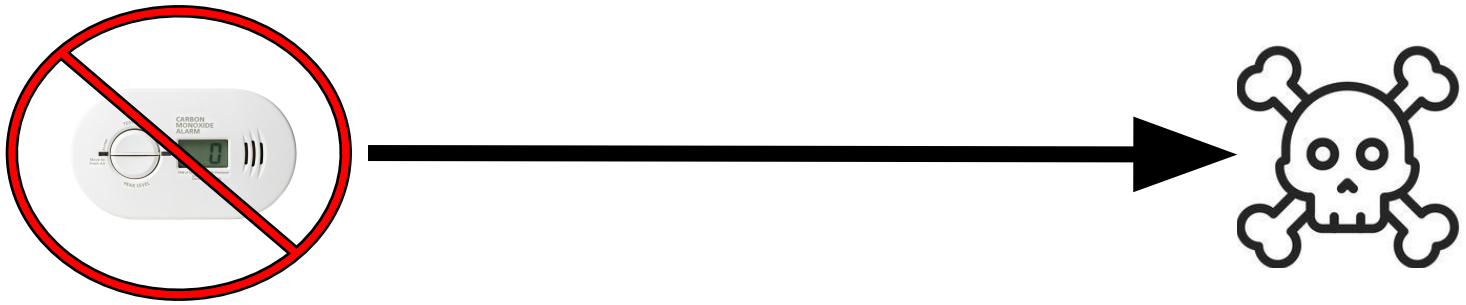
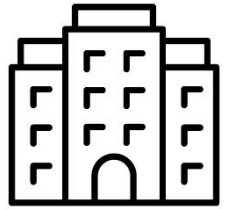
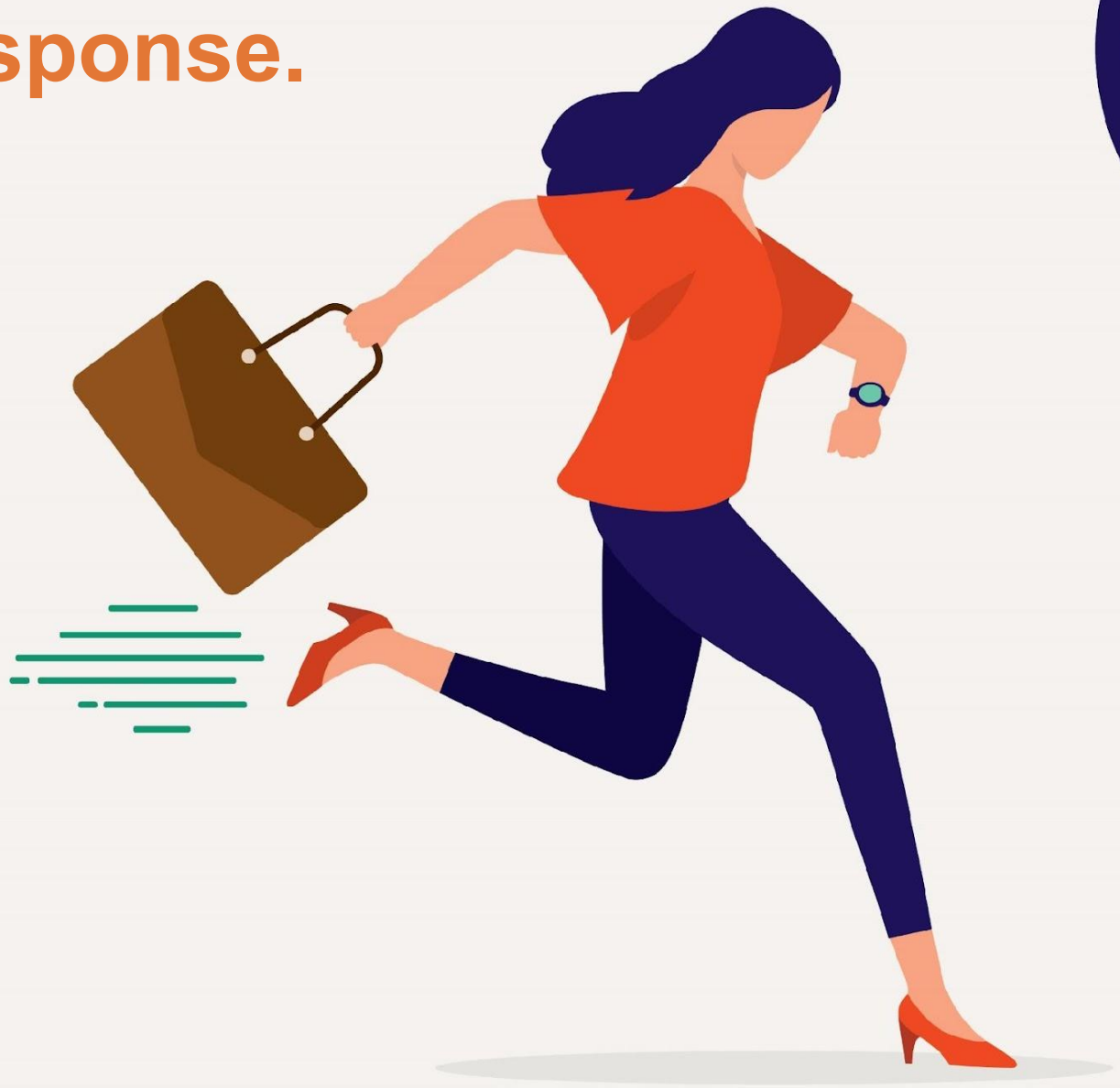






Active surveillance gives us more specific information.

The more timely information from active surveillance allows for prompt response.



Active surveillance comes with several challenges.

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Unknown reporting rate

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Difficulty obtaining data

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A lot of effort required with often limited staff

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Unknown reporting rate

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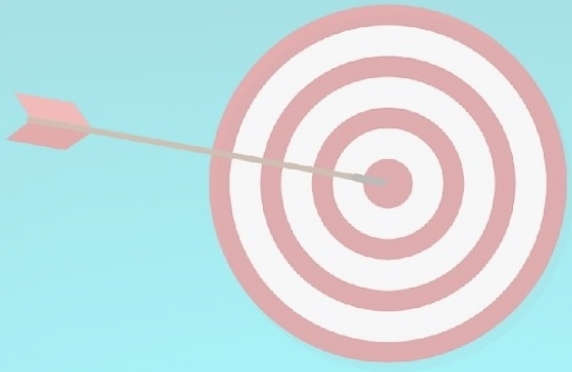
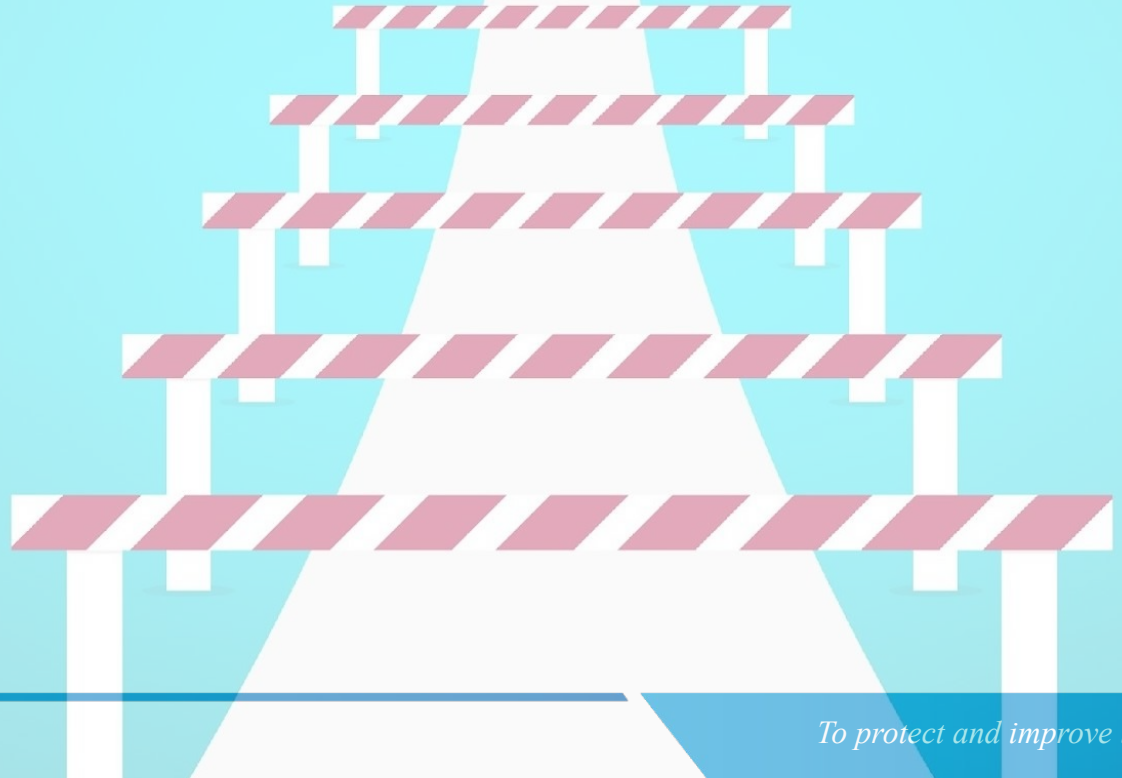
Non-specific symptoms



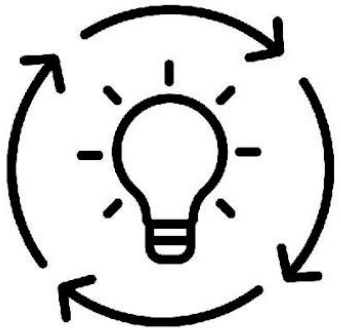
Leveraging partnerships could make active surveillance more feasible.



Benefits of active surveillance include:

Immediate action

Program planning and evaluation



Formulating hypothesis

Key Takeaways:

1. Passive surveillance provides useful but generalized information.

Key Takeaways:

2. Active surveillance has many benefits but requires a lot of effort and resources.

Key Takeaways:

3. Leveraging resources and partnerships could make active surveillance more feasible.

Leveraging partnerships requires an examination of those working in CO poisoning, including what work they currently do and the resources we can use.

Acknowledgements

KDHE Team

Henri Menager
Jaime Gabel
Gabe Haas
Jessica Willard
Vital and Health Statistics Data Analysis Team
Kansas Poison Control Center
Kansas Hospital Association

EIS Supervisors

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Thank You/Questions