

Broadening Our Audience: Increasing Participation and Collaboration

4:15 PM EST | December 6th, 2022 | 2022 SyS Symposium

Moderator:

- Becky Lampkins, MPH - CSTE

Presenters:

- Lowrie Ward, MPH, CPH - Alaska Native Tribal Health Consortium, AK Native Epidemiology Center
- Heidi Jonson, MPH – Minnesota Department of Health
- Scott Johnston, MPH – Kansas Department of Health and Environment



Council of State and Territorial Epidemiologists



Lowrie Ward, MPH, CPH
Alaska Native Tribal Health Consortium, AK Native
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Alaska Department of Health



Increasing Tribal Hospital Participation in Alaska's Syndromic Surveillance Program through Tribal Epidemiology Center Partnership

Lowrie Ward, MPH, CPH, Alaska Native Tribal Health Consortium, Alaska Native Epidemiology Center

Anna Frick, MPH, CIC, Alaska Department of Health, Division of Public Health

Session Content

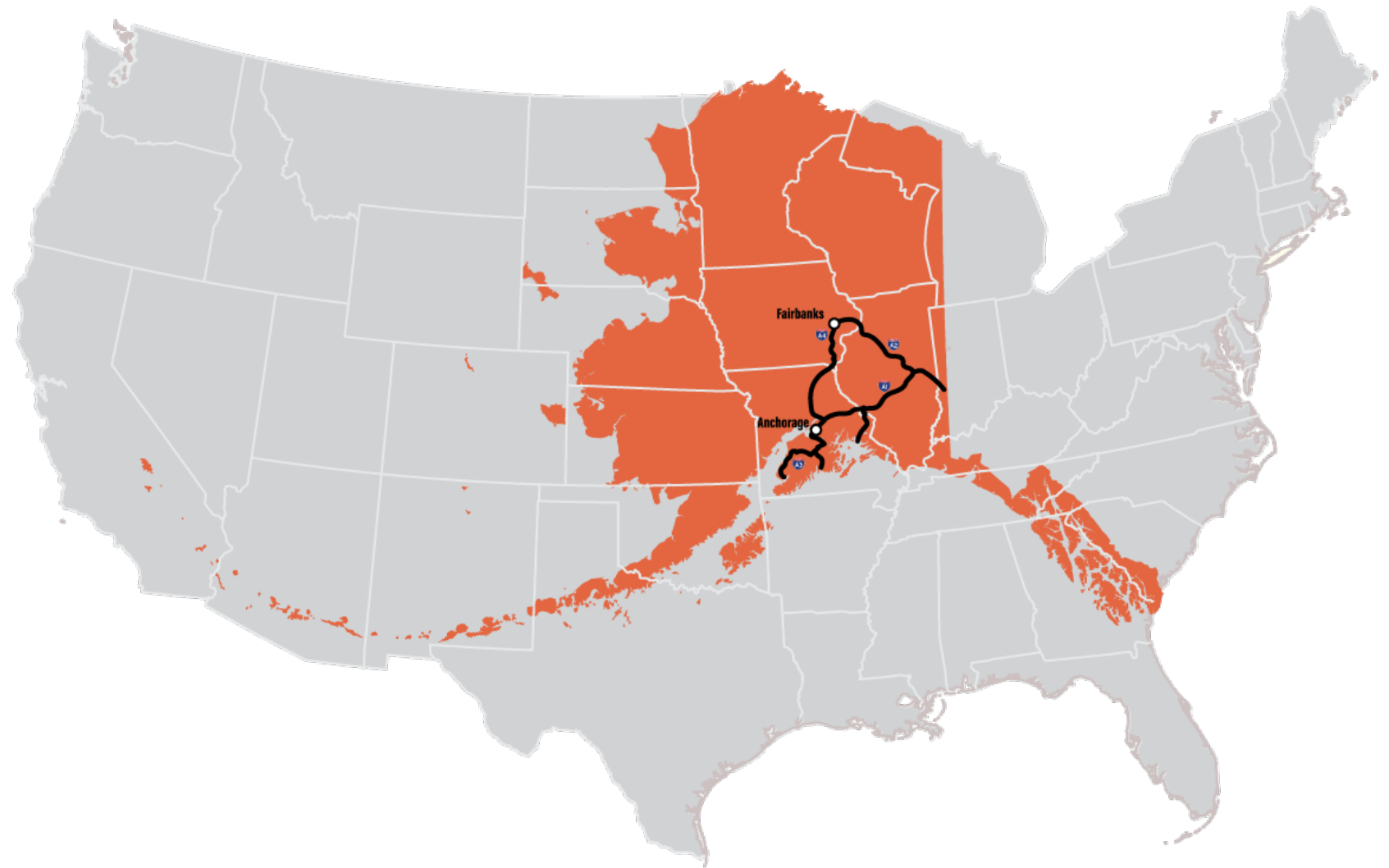
- Background
 - Alaska public and tribal health
- Methods and Results
 - Creating a syndromic surveillance program at the Tribal Epidemiology Center and working jointly with the state
- Conclusions
 - Successes and lessons learned



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Alaska



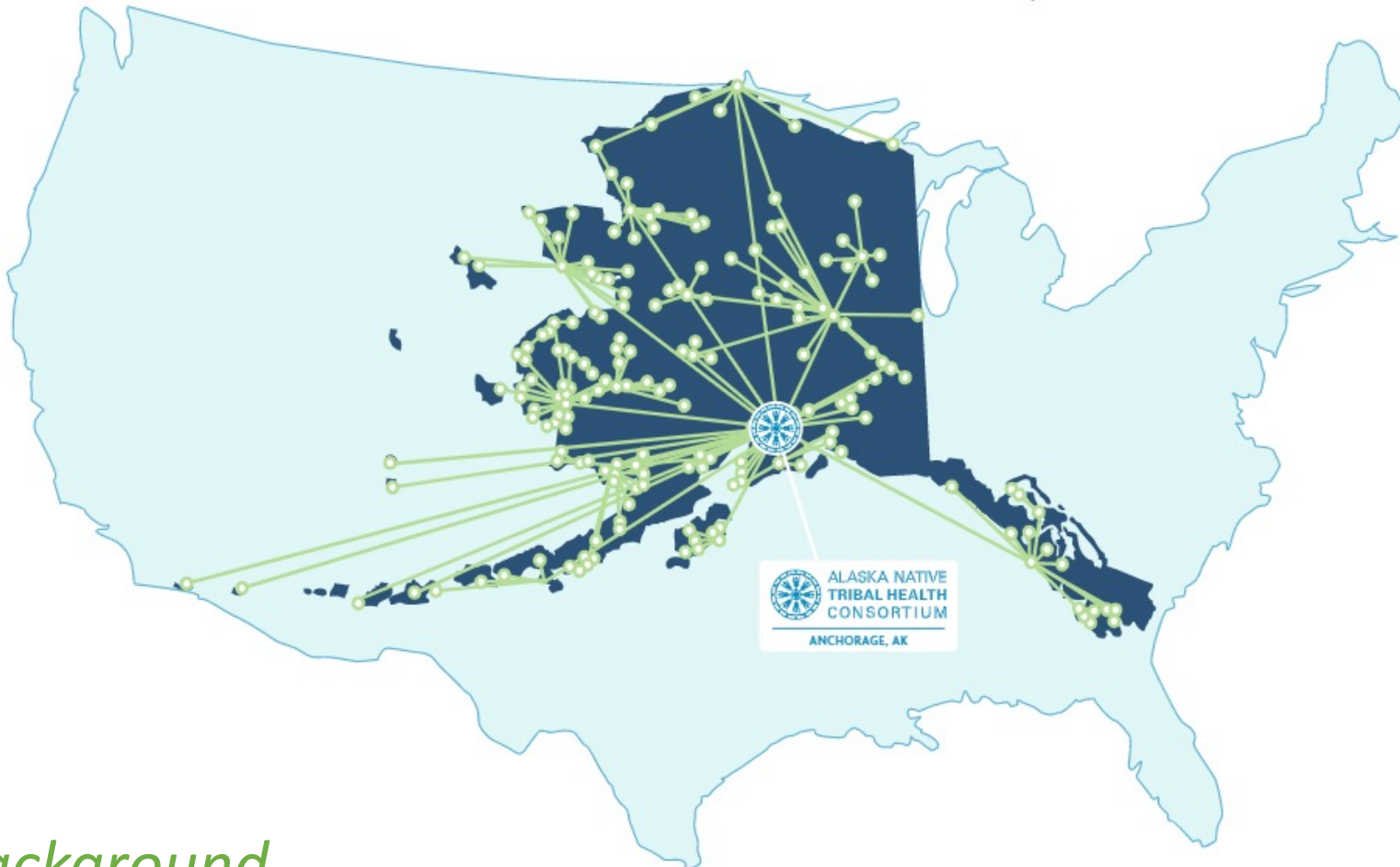
Public Health and Syndromic Surveillance

- Alaska's Syndromic program sits in the Section of Epidemiology at the Department of Health
- Participant in NSSP since 2014
- Prior to this project, 15/20 civilian hospitals actively sending data
 - Remaining hospitals all remote tribal facilities



Alaska Native demographics and healthcare

The Alaska Tribal Health System



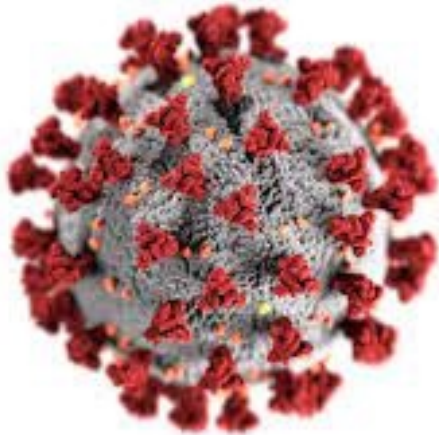
Background



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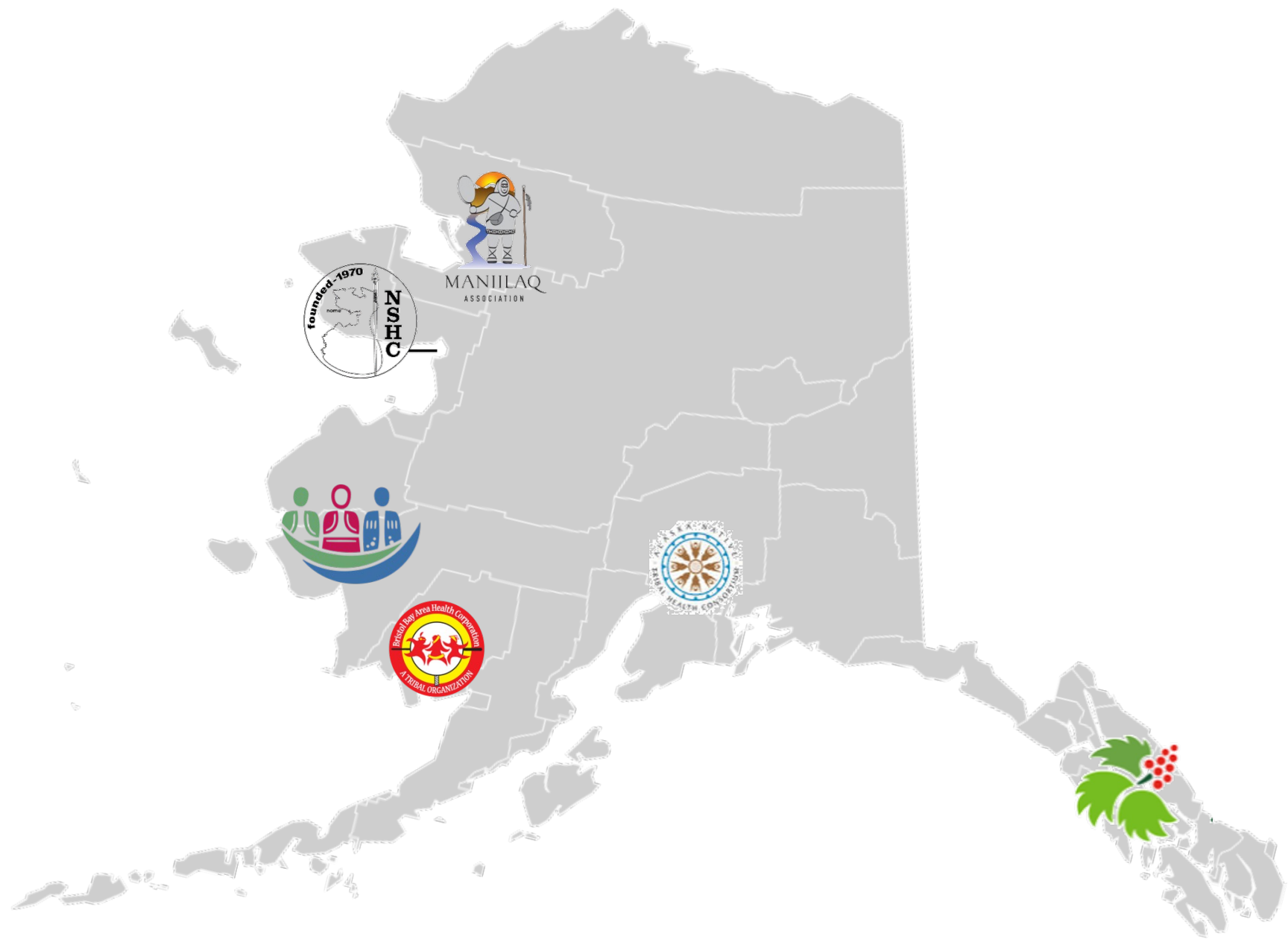


Tribal hospital participation in SyS



New facility interest

- 2022: on boarded new facilities
 - Collaborative project included:
 - Cerner
 - ANTHC Informatics
 - ANTHC Alaska Native EpiCenter
 - The Section of Epidemiology
 - The State's Health Information Exchange
 - Five Tribal Health Organizations



Methods and Results



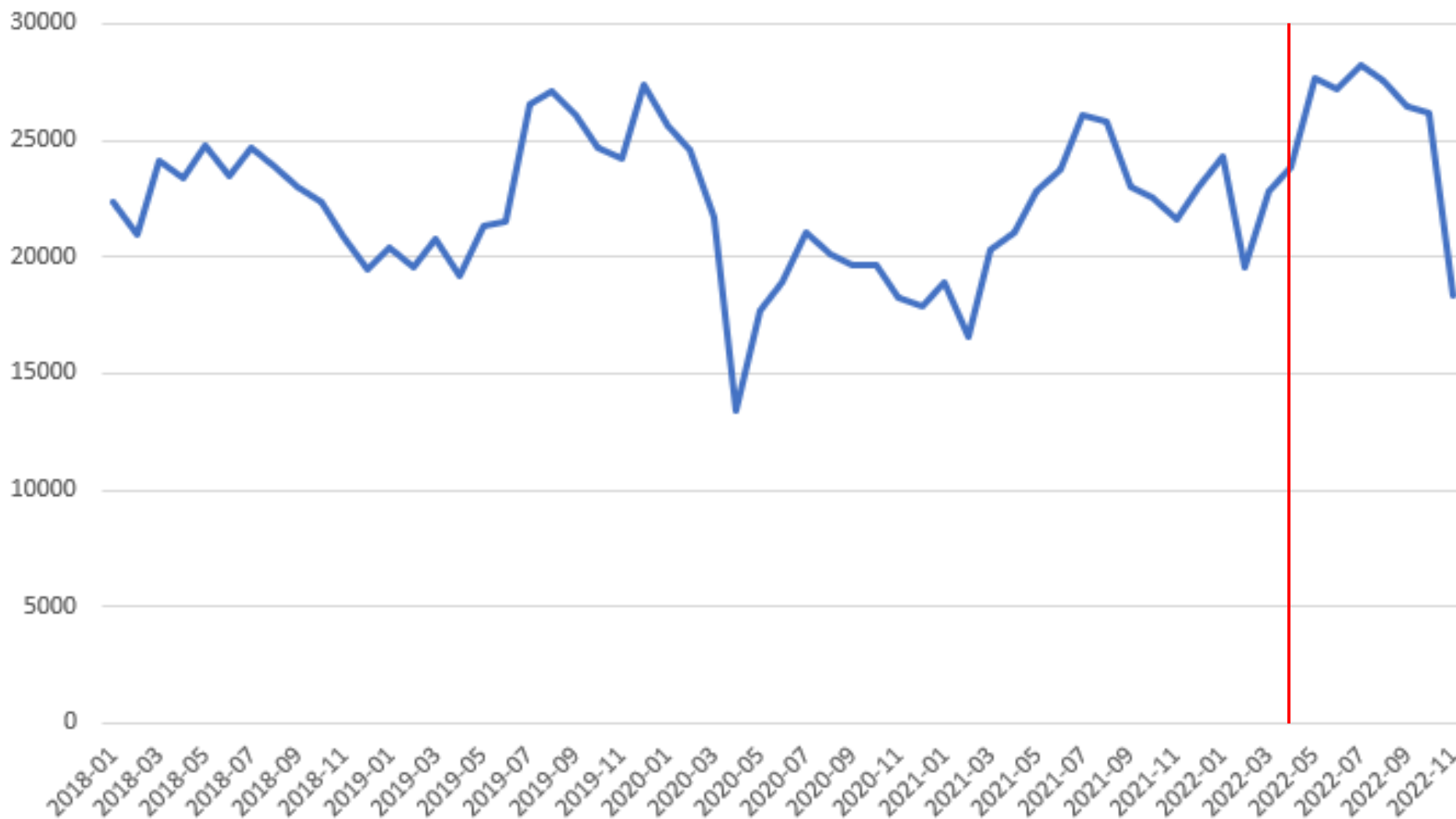
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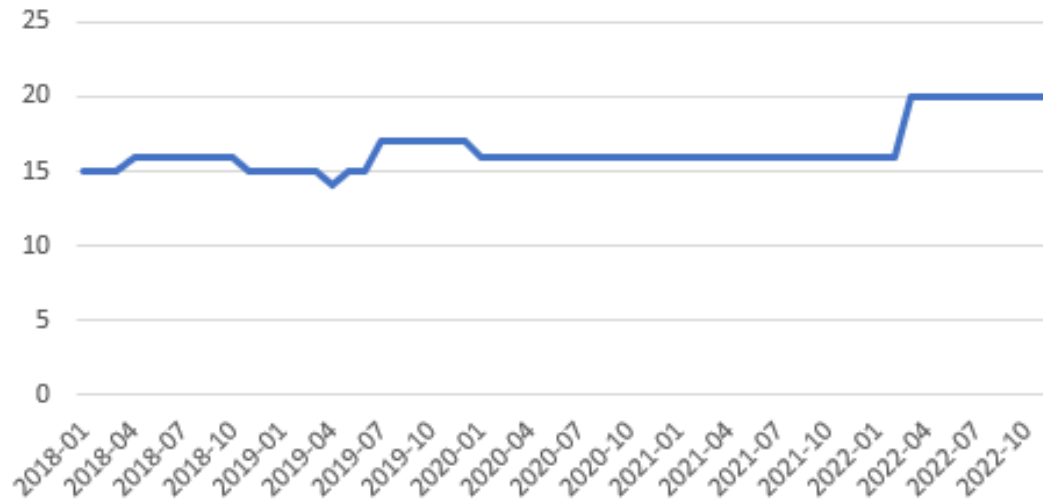
Line-level data to an outside partner??!?!?

- New concept for AK
- Two challenges:
 - Permission from facilities
 - Who specifically is getting access?
- ANEC and each TH signed a DUA specifying terms
 - Instructed DOH to execute
- ANEC provided a list of included staff to TH and DOH

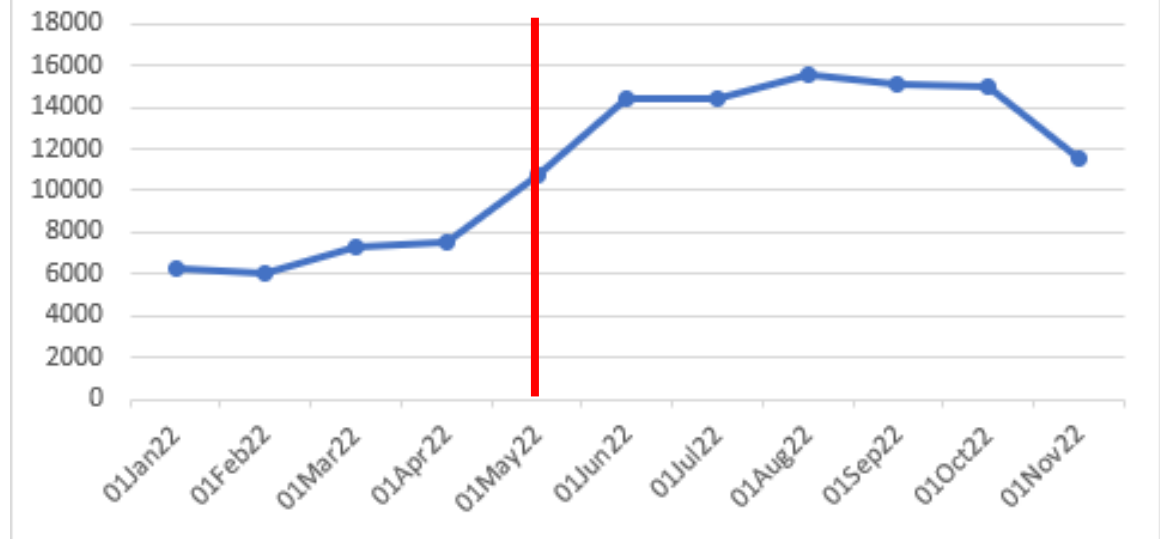
Total Emergency Visits by Month, Alaska 2018-November 2022



Number of facilities reporting Emergency data,
Alaska 2018-November 2022



Outpatient Visits reported to Syndromic
Surveillance, Alaska 2022



Teamwork makes things easier!

- Many of the THOs use a shared instance of Cerner
 - Finding the right IT people can be difficult (some things are facility-level, some system-level)
- ANEC has an 'inside view' of who does what → easy to find the right staff!
- ANEC received permission to review medical records for data validation
 - Can translate ESSENCE variable names and EHR field names
 - Can help actually validate ESSENCE against the medical record
 - Can check ESSENCE aggregate results against EHR aggregate results

Lowrie Ward – laward@anthc.org
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Thank You

qagaasakung baasee' tsin'aen quyanaq
dogedinh quyanaa igamsiqanaghalek
'awa'ahdah gunalchéesh chin'an mahsi'
tsin'e e way dankoo háw'aa quyana

Appendix – selected portions of DUA

**ANTHC Epidemiology Center
Data Use Agreement
for
Syndromic Surveillance
Contract No. ANTHC-22-C-**

This Data Use Agreement (“Agreement”) is made as of _____, 2022 (the “Effective Date”), by and between _____, (“THO”) whose address is _____ and the Alaska Native Tribal Health Consortium (“ANTHC”), whose address is 4000 Ambassador Drive, Anchorage, Alaska 99608, (individually “Party” and collectively “the Parties”).

The Agreement sets out the terms and conditions for THO to receive technical assistance and support from the ANTHC EpiCenter for Syndromic Surveillance monitoring using data accessible in the system Electronic Surveillance System for the Early Notification of Community-Based Epidemics (“ESSENCE”) system.



**ANTHC
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WHEREAS, ANTHC is a tribal organization created under Section 325 of Public Law 105-83 to provide statewide health services through the Alaska Native Medical Center. Within ANTHC's Division of Community Health Services, the Alaska Native Epidemiology Center ("ANTHC EpiCenter") carries out public health activities pursuant to 25 U.S.C. §1621m and as permitted under the Health Insurance Portability and Accountability Act of 1996, as amended ("HIPAA") 42 CFR §164.512(b);

WHEREAS, the ANTHC EpiCenter has a Tribal Syndromic Surveillance program that uses data to benefit the entire Alaska Tribal Health System in a number of ways, such as (i) early detection of changes in a community's health status and/or outbreaks that might represent a public health emergency, (ii) identifying, following, and tracing patterns of disease, illness, and public health conditions in the community geographically and demographically at any given time (e.g., following the size, spread, and tempo of outbreaks), (iii) determining the impact of specific targeted health interventions, and (iv) providing reassurance that an outbreak has not occurred;

WHEREAS, THO participates in Syndromic Surveillance by sharing Electronic Protected Health Information as defined under 45 CFR 160.103 of HIPAA ("Protected Health Information" or "ePHI") with the State of Alaska, and THO has listed ANTHC EpiCenter as a "User" of THO's ePHI data on the syndromic surveillance usage paperwork completed with the State's Department of Health and Social Services;

WHEREAS, THO desires its ePHI data be used for the purposes of public health surveillance in their service region and for the Alaska Tribal Health System, and THO agrees that the participation and support from ANTHC EpiCenter advances these goals; and

WHEREAS, THO and ANTHC EpiCenter believe that this exchange of Protected Health Information is permissible under HIPAA and state law, but desire to memorialize their understanding in this Agreement.



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2. Data Access:

2.1 THO grants ANTHC EpiCenter the right to access and use all facility-level surveillance data including all ESSENCE-based or user designed queries and data details. These rights include initiating queries, validating data, and preparing reports on behalf of the THO and the Alaska Tribal Health System. ANTHC EpiCenter will view such surveillance data according to the public health surveillance needs of THO or the Alaska Tribal Health System.

3. Proposed Data Use:

ANTHC EpiCenter may perform the following:

3.1 Monitor THO's ePHI data for requested conditions to generate regular facility-specific and the Alaska Tribal Health System ("ATHS")-specific reports and dashboards;

3.2 Calculate and compare THO data with ATHS facility data statewide and regionally, where appropriate, for various epidemiology purposes, including identifying, monitoring, tracking, following, reporting, and researching syndromes, diseases, diagnoses, and conditions;

3.3 Perform data validation routinely and when needed using additional ANTHC and statewide data sets with existing agreements and permissions in place;

3.4 Provide aggregate data for ATHS purposes, if applicable; and

3.5 Share the THO's data with subject matter experts and analytic consultants when needed for data analysis support.

4. Assurances with respect to all accessed syndromic surveillance data.

4.1 ANTHC EpiCenter will not use nor permit others to use the THO's ePHI data in any way except for the specific purposes authorized under this Agreement or by HIPAA;

4.2 ANTHC EpiCenter will not release nor permit others to release the data set(s) or any part of them to any person who is not a member of ANTHC EpiCenter or who does not have a Business Associates Agreement with ANTHC for the purpose of data analysis or data analysis consultation, unless otherwise approved by THO.



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Heidi Jonson, MPH
Minnesota Department of Health

Matthew Giljork, MSc
Olmstead County Public Health Services





Minnesota's first state and local public health syndromic surveillance data sharing with Olmsted County Public Health Services (OCPHS)

Heidi Jonson | Minnesota Department of Health (MDH)

Matthew Giljork | Olmsted County Public Health Services (OCPHS)

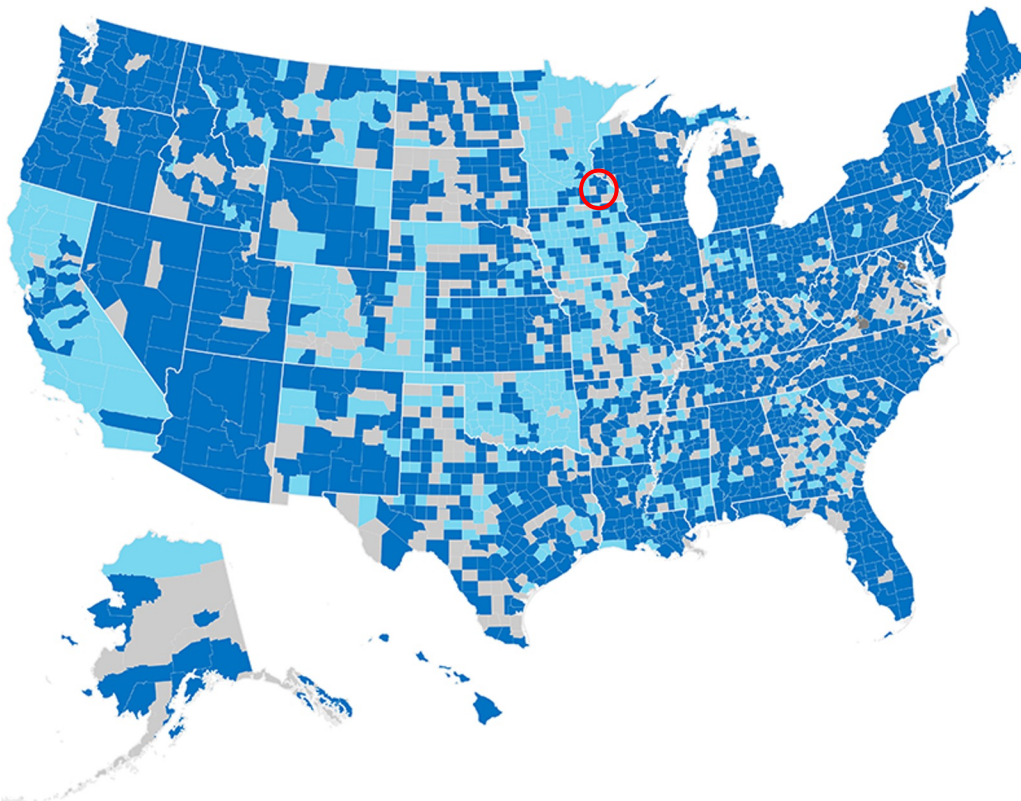
December 6, 2022

PROTECTING, MAINTAINING AND IMPROVING THE HEALTH OF ALL MINNESOTANS

Background

Syndromic Surveillance in Minnesota

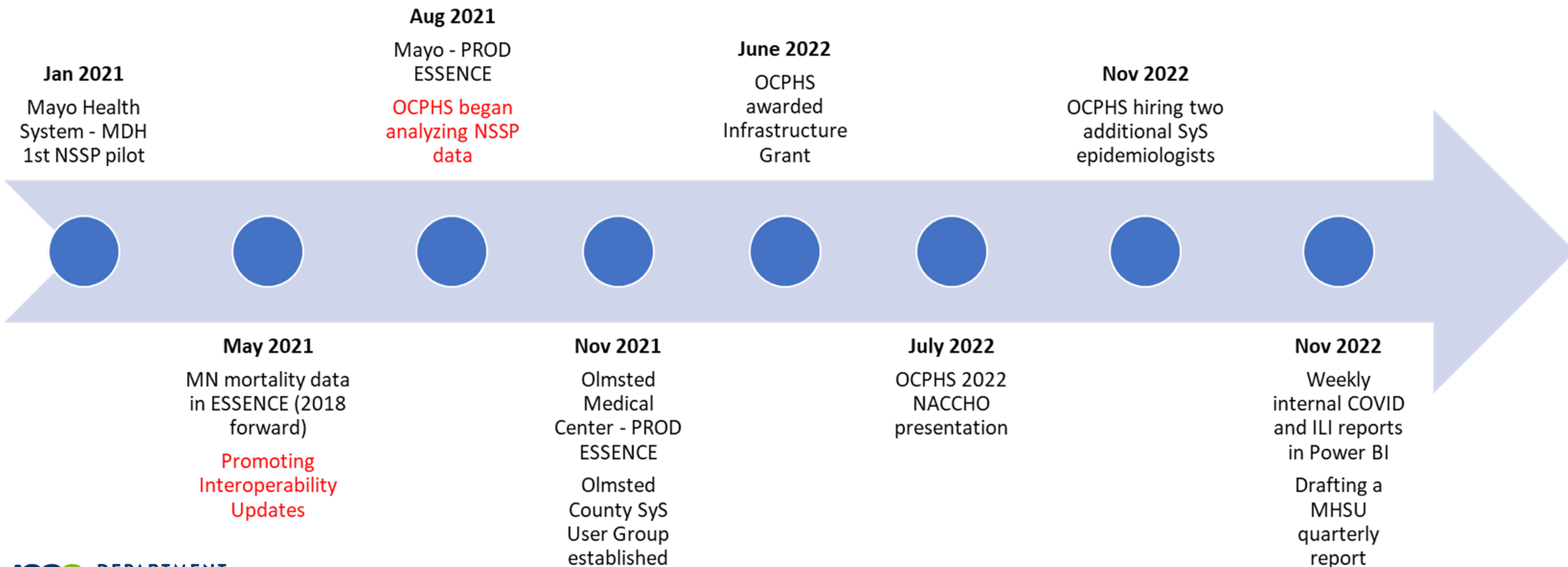
■ Recent Data in NSSP ■ No Recent Data in NSSP ■ No Eligible Facilities
August 1, 2022–November 1, 2022.



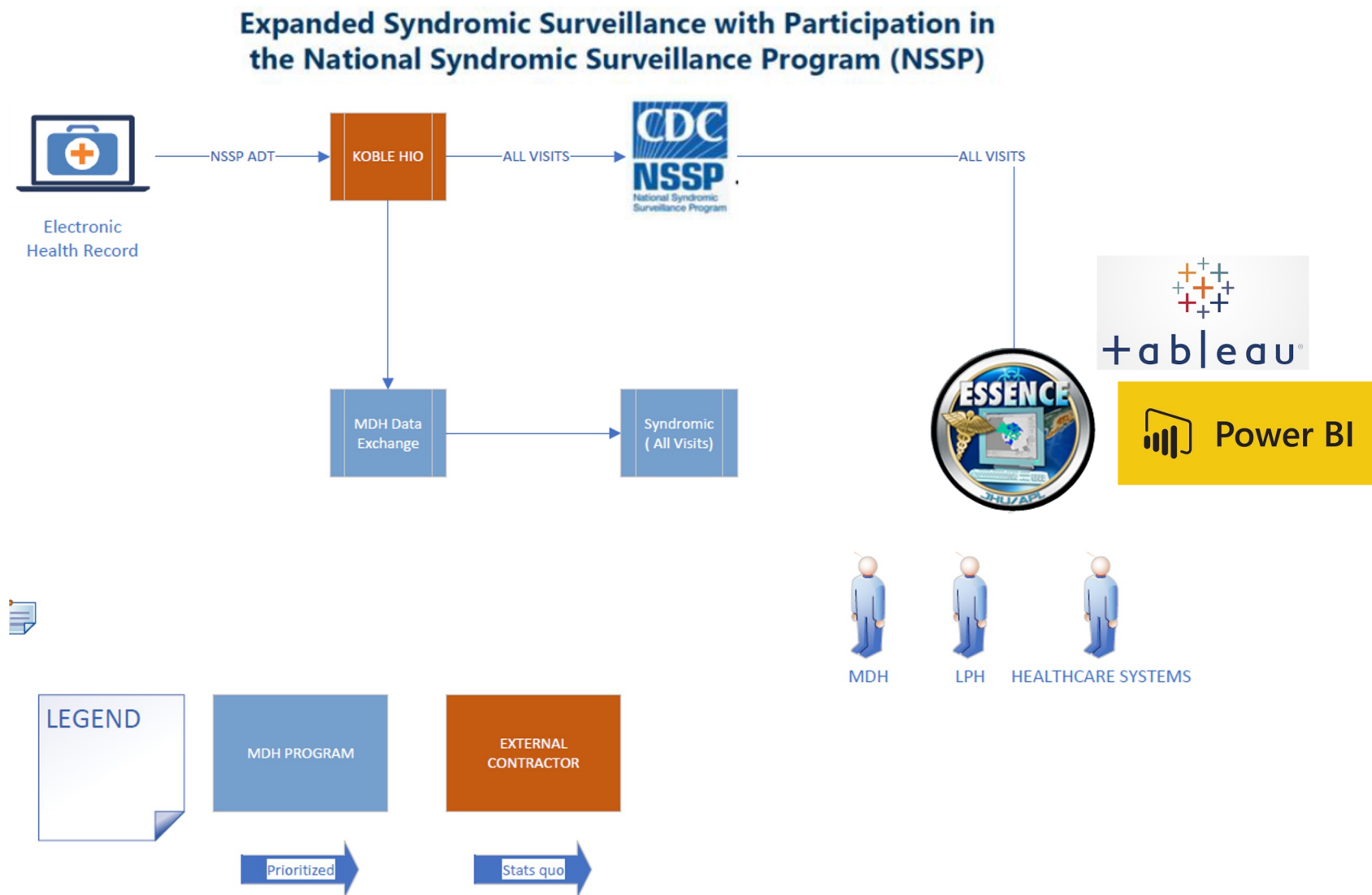
- Minnesota is a gap in the map of syndromic surveillance coverage.
- We have lagged other jurisdictions in the implementation and use of syndromic surveillance.

Source: <https://www.cdc.gov/nssp/participation-coverage-map.html>

Syndromic Surveillance at Olmsted County Public Health Services (OCPHS)



NSSP data flow to OCPHS



Methods

Olmsted County's Community Health Needs Assessment

MHSU Indicators

CDC All Drug v2
CDC Opioid Overdose v3
CDC Heroin Overdose v4
CDC Benzodiazepine OD v1
CDC Alcohol v1
CDC Stimulants v3
CDC Mental Health v1
CDC Suicidal Ideation v1
CDC Suicide Attempt v1
OC Suicide v1

- Olmsted County's 2018 Community Health Needs Assessment revealed increases in mental health and substance use (MHSU) conditions.
- Olmsted utilized the CDC's pre-existing syndrome definitions to monitor these conditions in their county in near real-time, for the first time!

ESSENCE - CDC Suicidal Ideation v1 Query

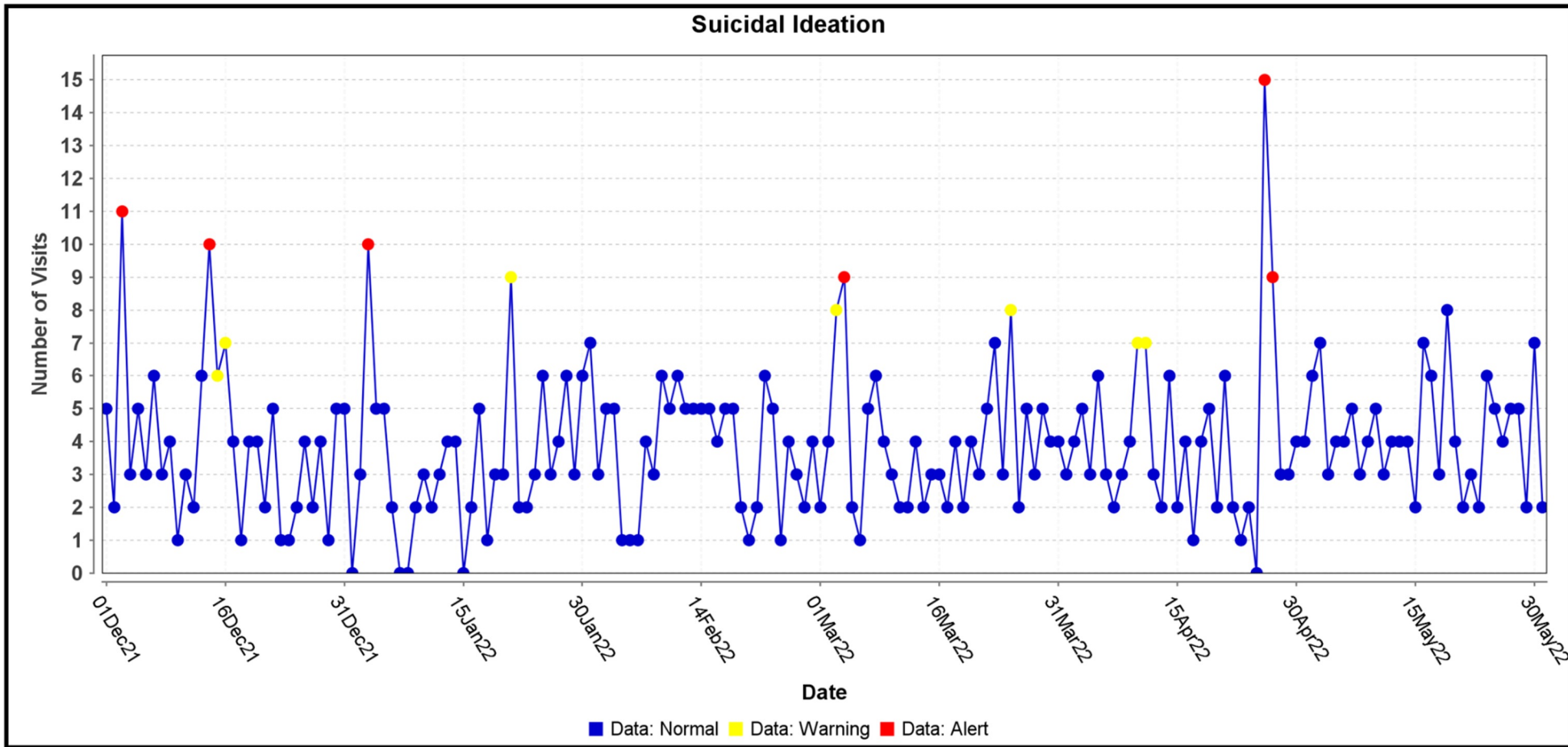


Fig. 1. Daily visits for CDC Suicidal Ideation v1 query. Alerts for daily values of $p < 0.05$ were established.

ESSENCE - Mortality Data

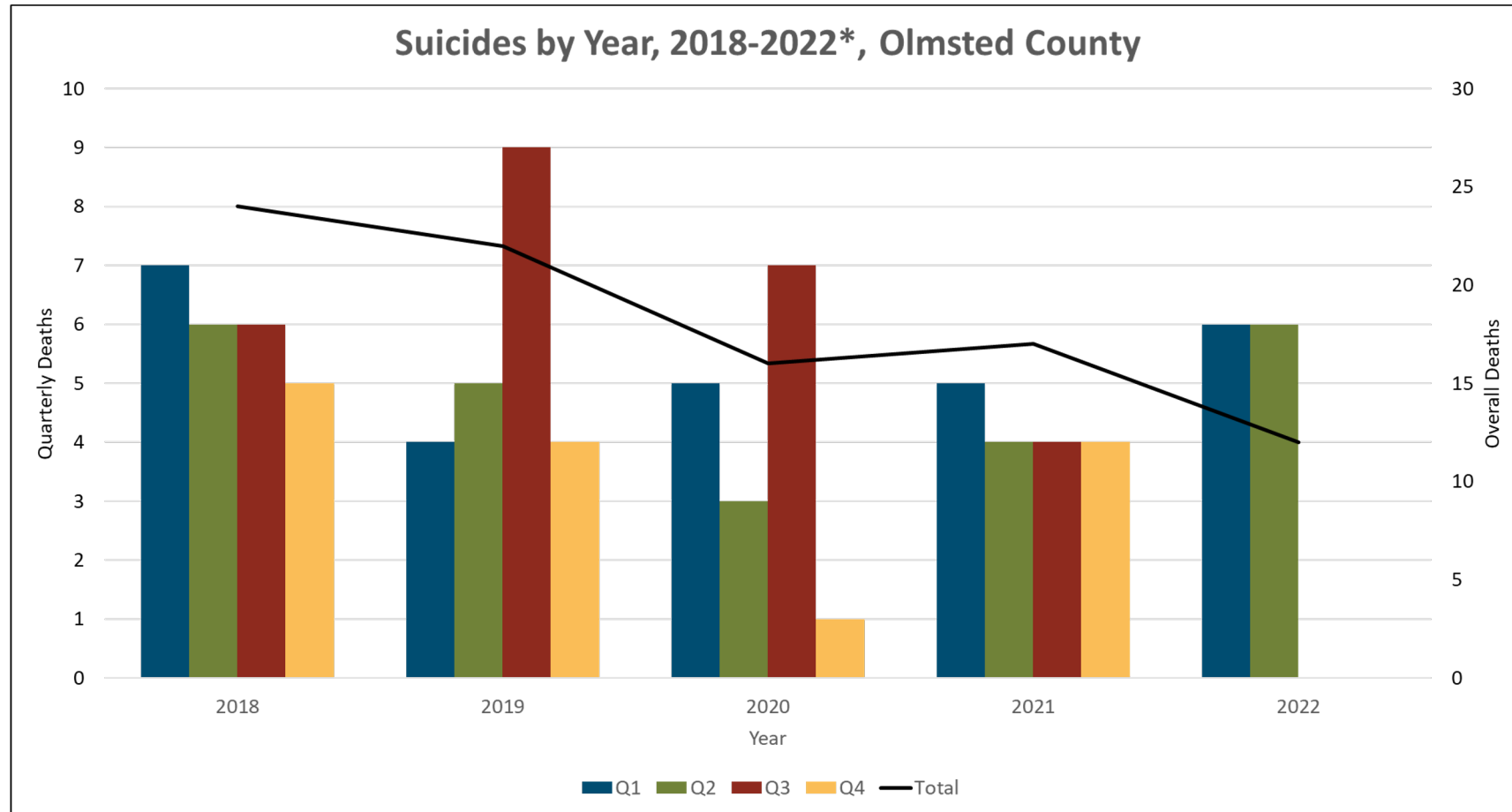


Fig. 2. Suicides by quarter, 2018-2022, in Olmsted County. Data is collected from the NVSS and housed within ESSENCE.

ESSENCE - CDC All Drug Overdose v2 Query

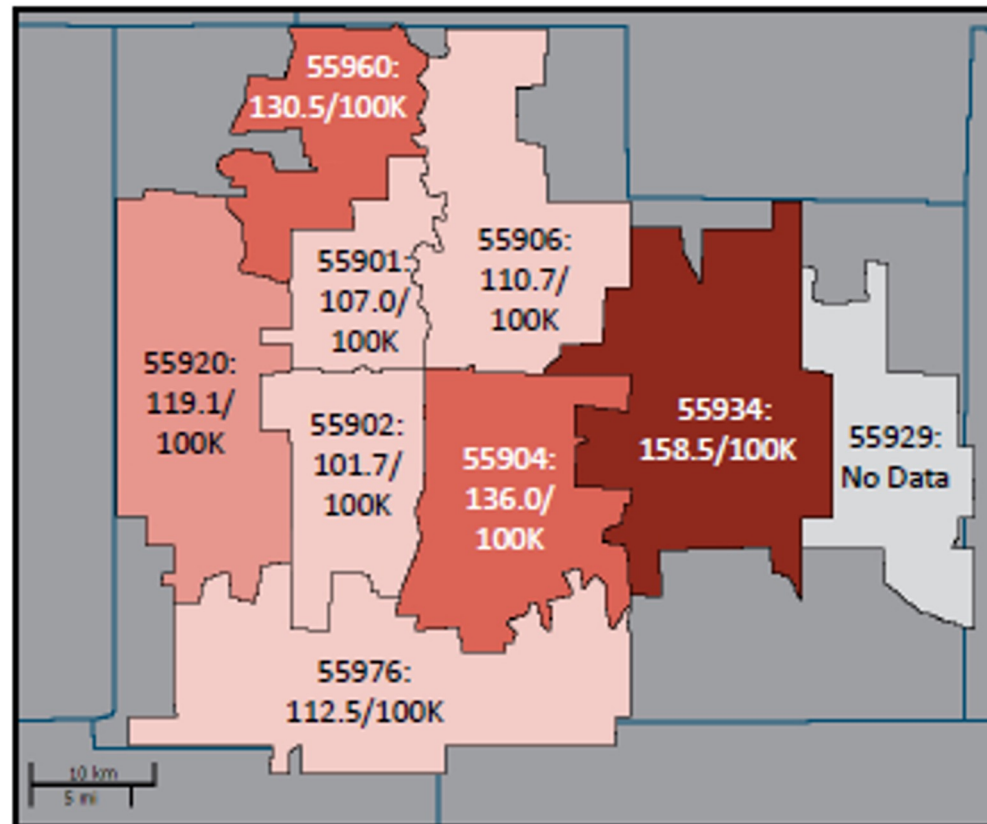


Fig. 3. Map of crude drug overdose incidence rates (per 100K), CDC All Drug v2 query.

Results

Mental Health and Substance Use Internal Dashboard via ESSENCE and Power BI (DRAFT FORMAT)



Olmsted County Public Health Services Mental Health and Substance Use Surveillance Report

Overview: Quarter 3 2022, July - September 2022

Data Sources:

- The data included in this report is representative of emergency room and inpatient hospital visits for Olmsted County residents entered into the National Syndromic Surveillance Program (NSSP).
- Visits to hospitals not onboarded into NSSP are not included.
- Mortality data is for Olmsted County death certificates submitted to the National Vital Statistics System (NVSS).
- Fatal events occurring out of state are not included in this report.

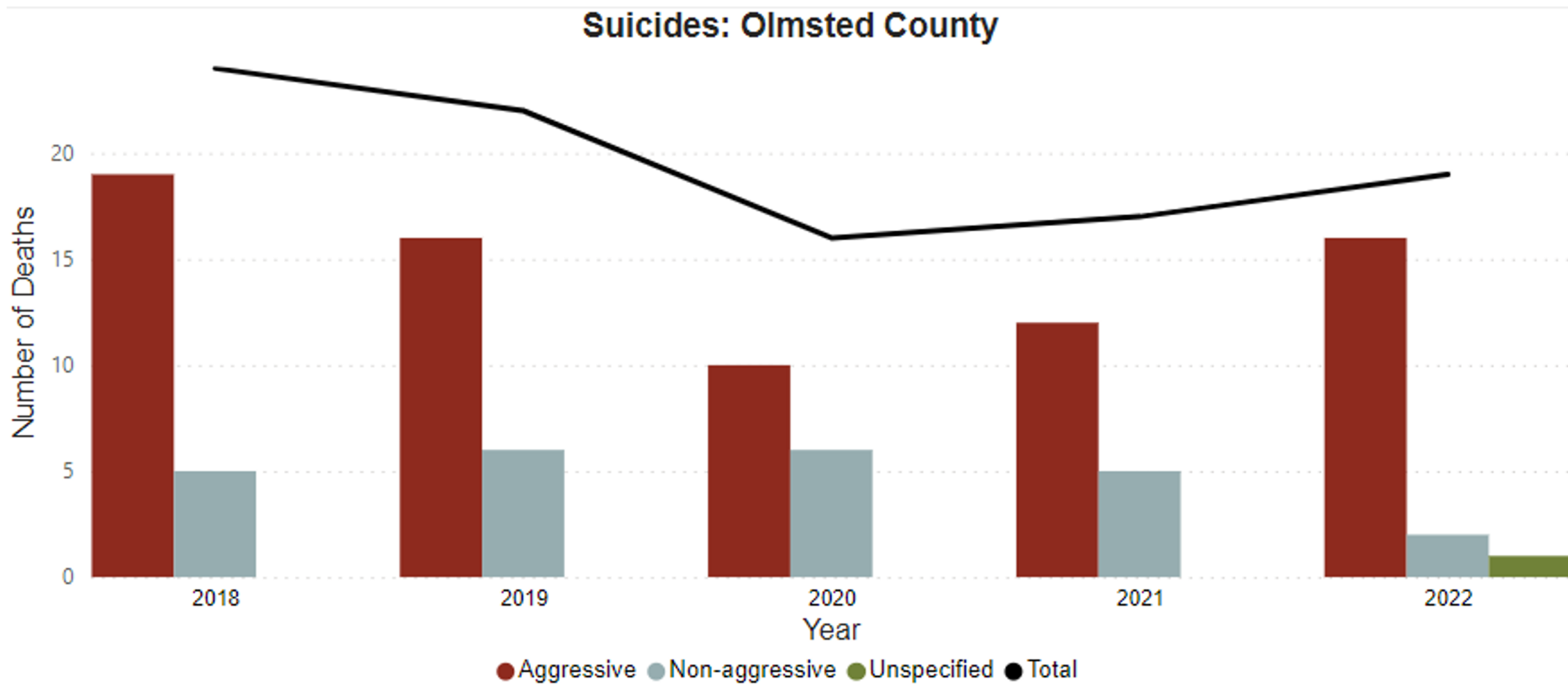
The data provided is from December 2022 to the last quarter. Mortality data is from January 2018. Data is updated by the first week of the following quarter.

Methods:

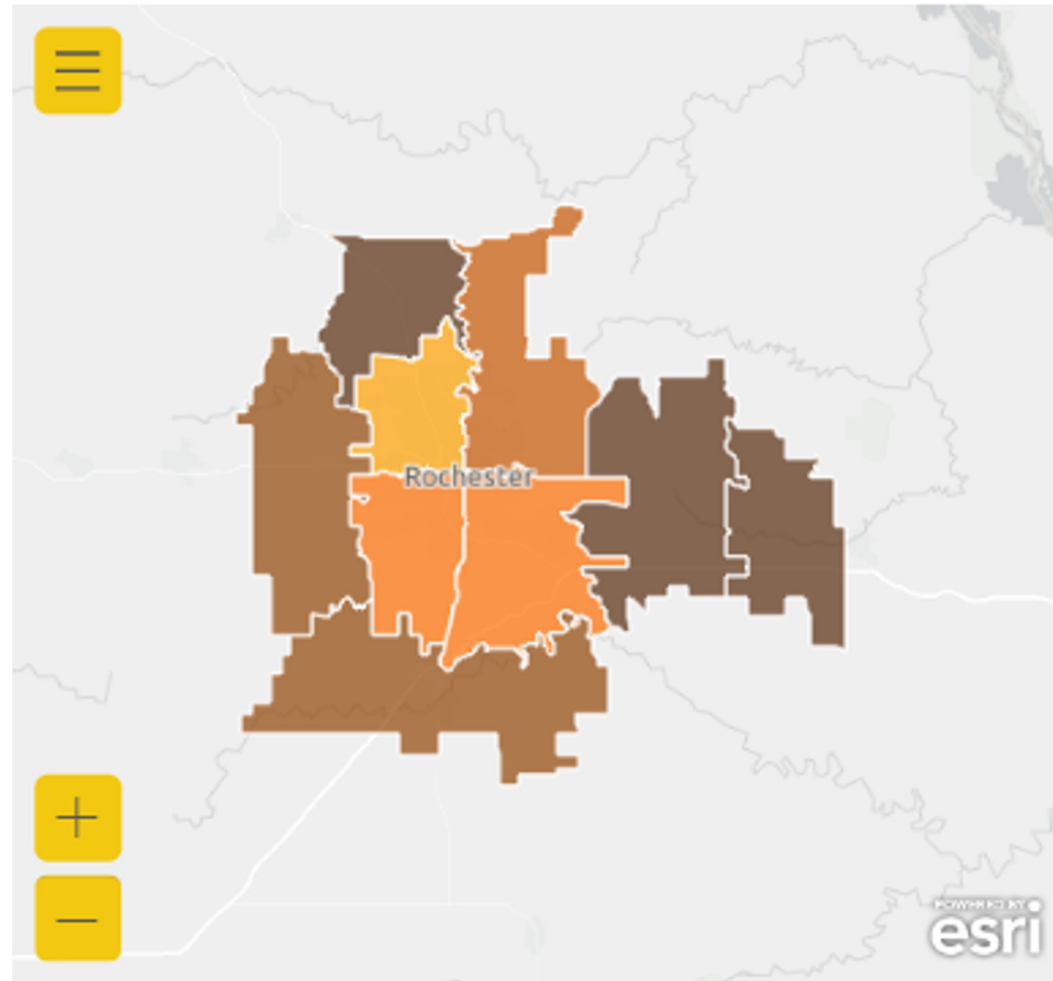
- Syndromic surveillance data was gathered and collected in the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) and fed into Power BI using Microsoft Excel sheets.
- Alerts are detected using a Poisson/Regression/EWMA. All methods of analysis take the previous 4 weeks of data (minus a 2-day buffer of the most recent days). Red alerts have a significance of 1% and yellow alerts have a significance of 5%. More information on methods can be found from the following publications:
 - Brillman JC, Burr T, Forslund D, Joyce E, Picard R and Umland E. Modeling emergency department visit patterns for infectious disease complaints: results and application to disease surveillance, BMC Medical Informatics and Decision Making 2005, 5:4, pp 1-14 <http://www.biomedcentral.com/content/pdf/1472-6947-5-4.pdf>.
 - Ryan TP. Statistical Methods for Quality Improvement. New York: John Wiley & Sons: New York, 1989.
 - Morton AP, Whitby M, McLaws M-L, Dobson A, McElwain S, Looke D, Stackelroth J, Sartor A; The application of statistical process control charts to the detection and monitoring of hospital-acquired infections; J Qual Clin Prac 2001; 21:112-117.
 - Burkom HS, Elbert Y, Magruder SF, Najmi AH, Peter W, Thompson MW. Developments in the roles, features, and evaluation of alerting algorithms for disease outbreak monitoring. Johns Hopkins APL Technical Digest 2008;27:313.

Data Manipulation:

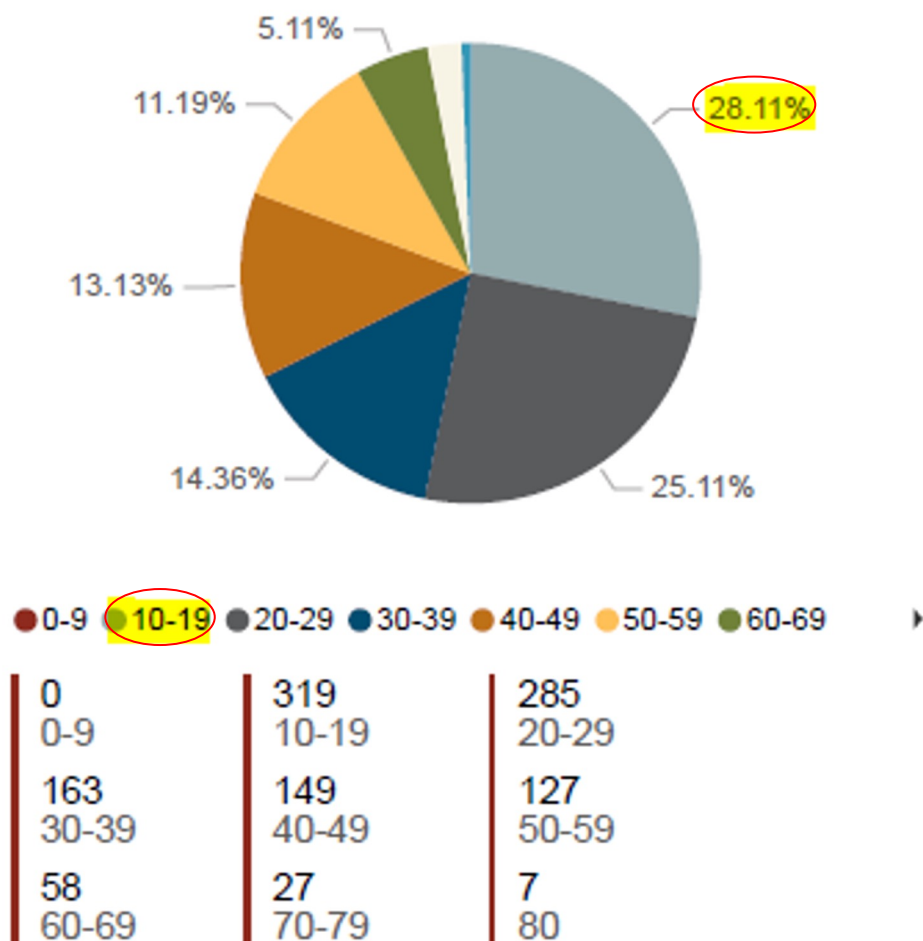
- Visualization widgets may be manipulated. Click on different parts of the visualization for a more granular view.
- The timeline widget in the upper righthand corner (found on most pages) may be filtered down by year (Y), quarter (Q), or month (M). The calendar will automatically display the first month selected.
- Most visualizations will drill through and automate other visualizations (e.g., filtering down to a date range will automate other visualizations to only include data for those dates).



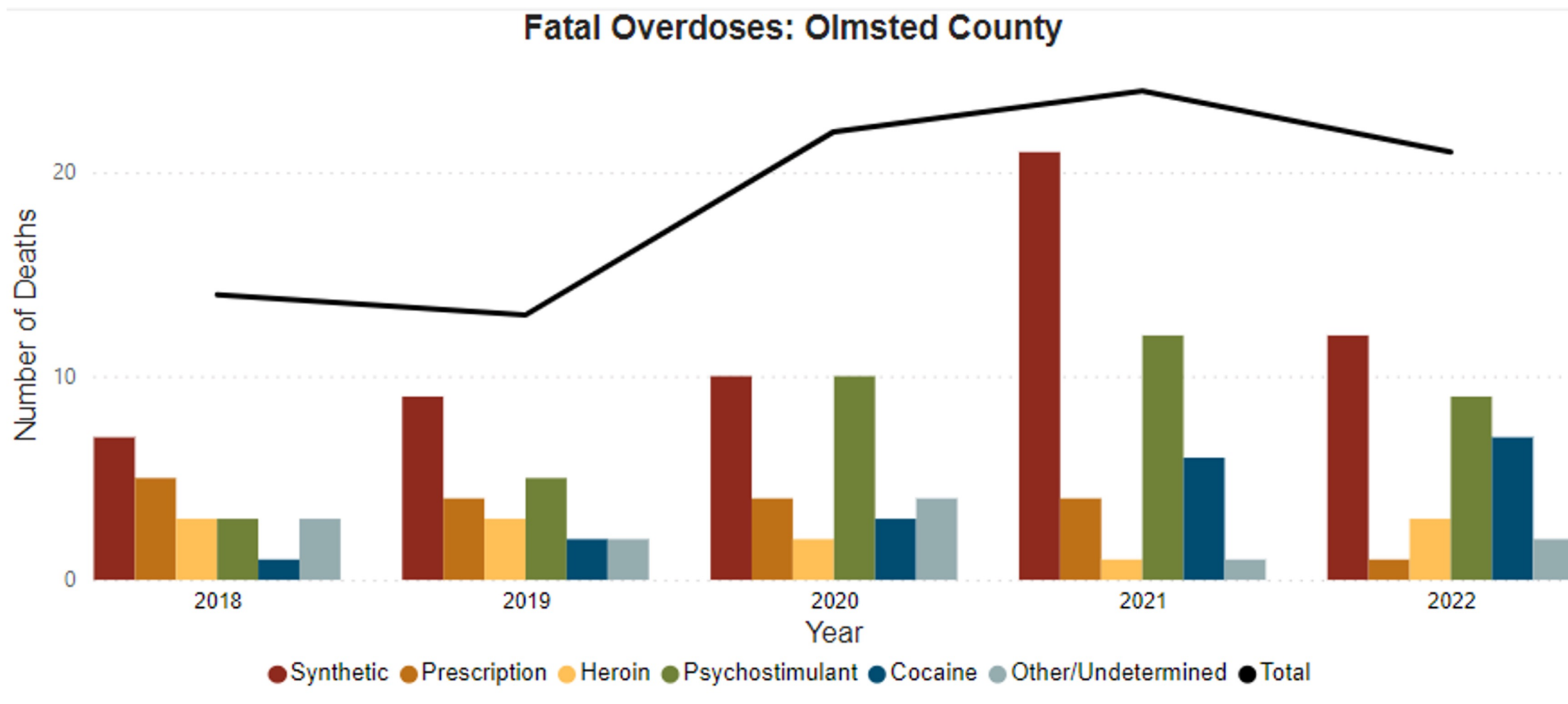
Suicides by ZIP Code



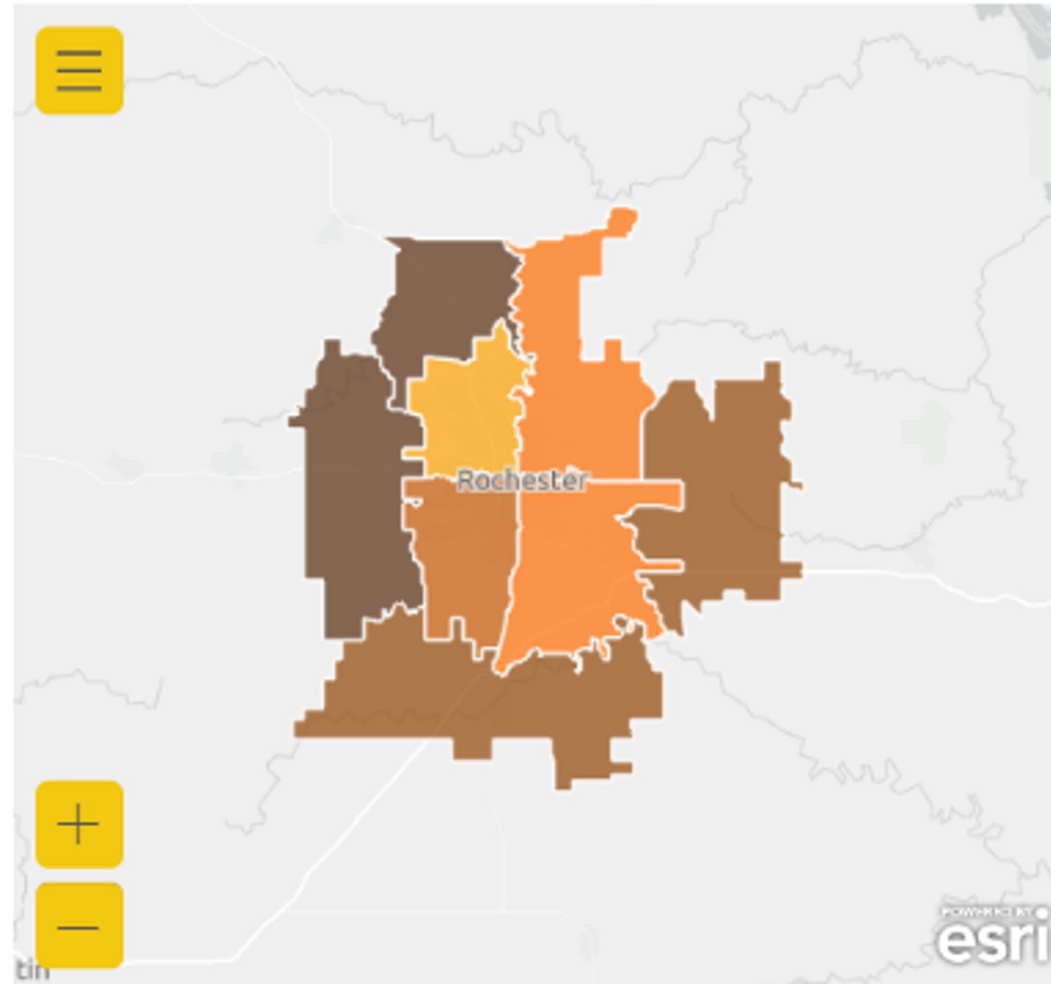
Suicidal Ideations by Age Group



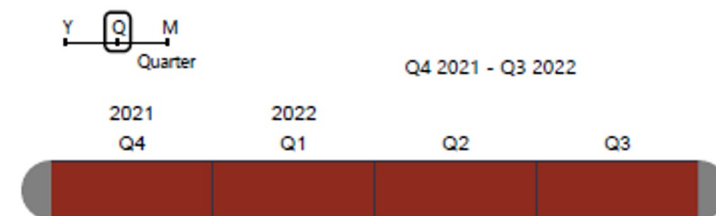
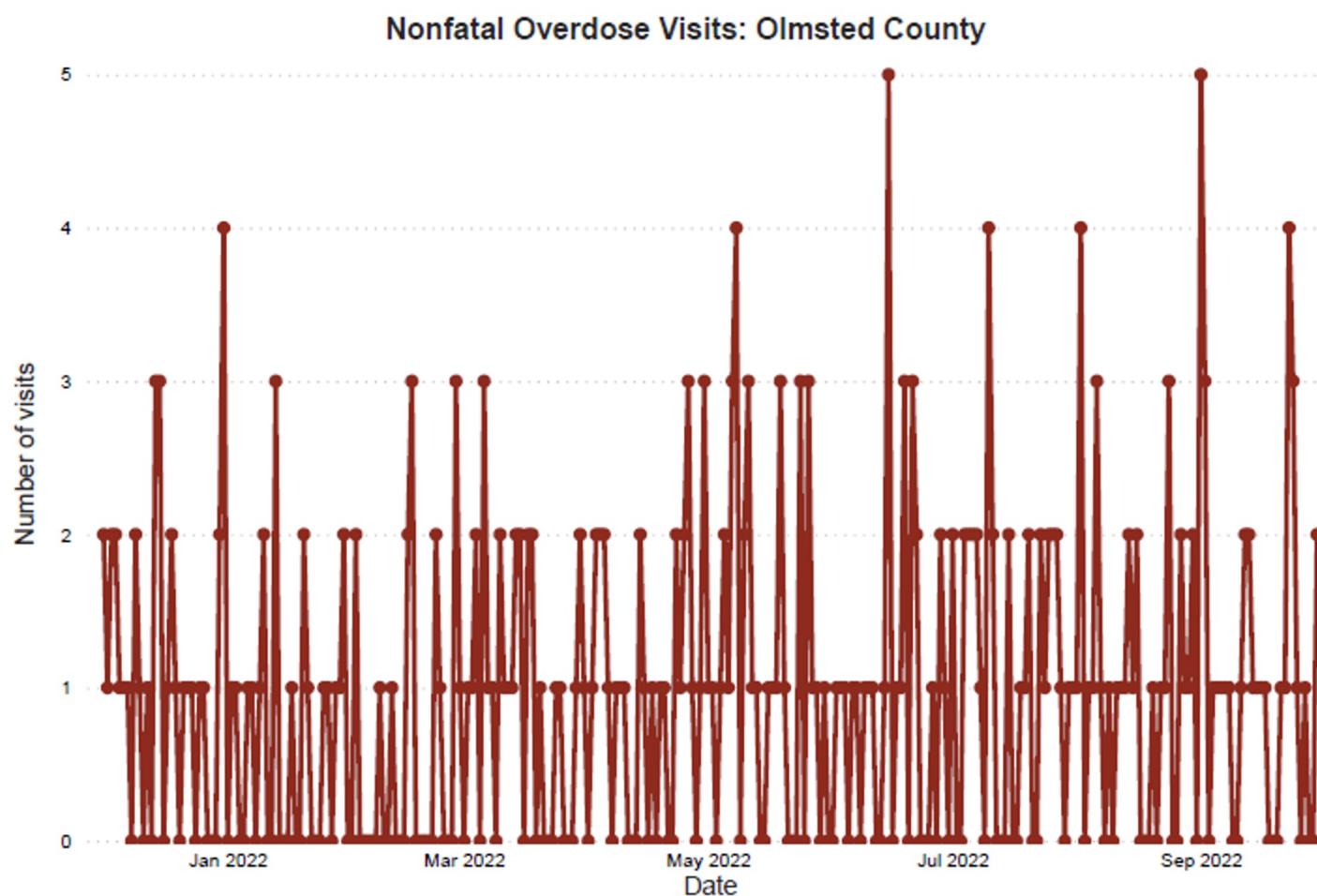
Graph #4



Fatal Overdoses by ZIP Code



Graph #6



December 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 0.25	2 0.44	3 0.24	4 0.16
5 0.32	6 0.41	7 0.54	8 0.90	9 0.28	10 0.57	11 0.50
12 0.64	13 0.50	14 0.06	15 0.02	16 0.50	17 0.49	18 0.25
19 0.40	20 0.50	21 0.60	22 0.99	23 0.57	24 0.50	25 0.58
26 0.55	27 0.50	28 0.50	29 0.90	30 0.24	31 0.00	

Alert Detection:

Blue: Normal (1.00-0.05)
Yellow: Warning (0.05-0.01)
Red: Alert (<0.01)

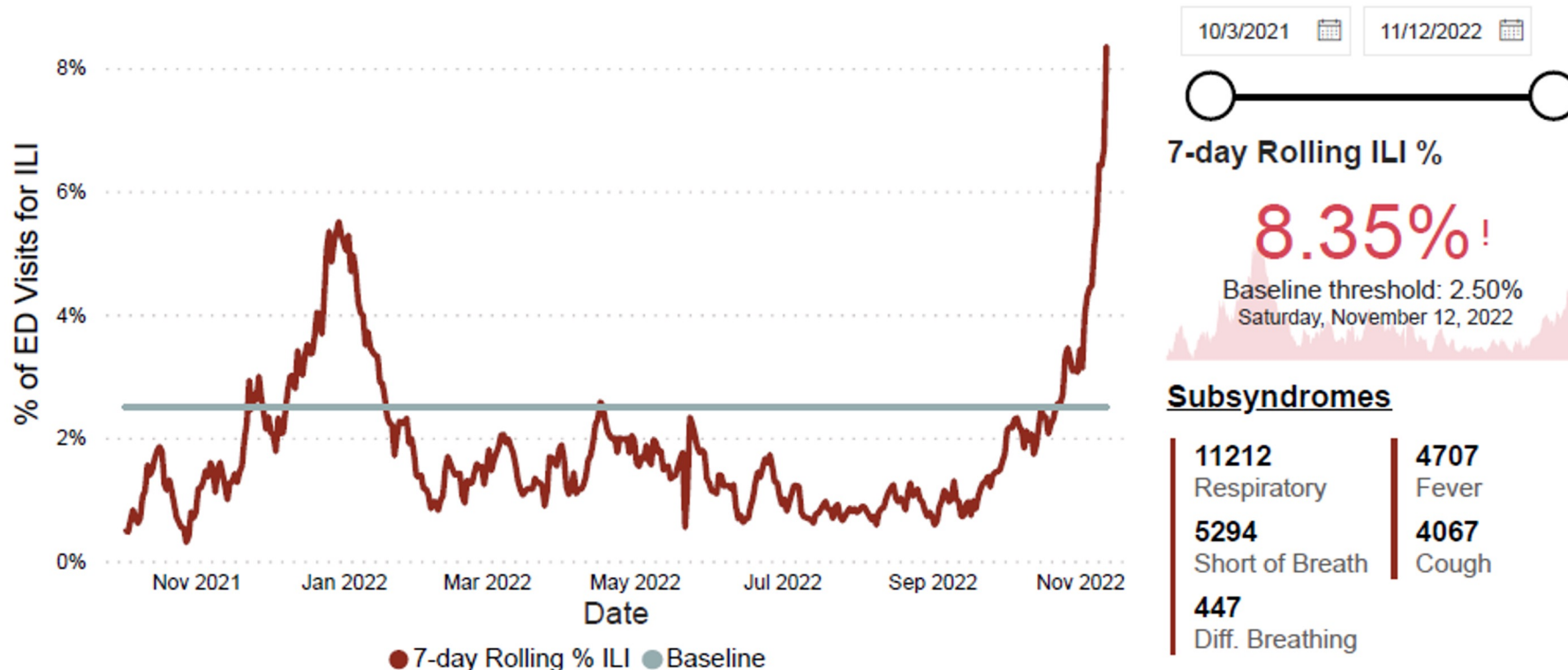
Year	Quarter	Month	Visits
2021	Qtr 4	December	35
2022	Qtr 1	January	20
2022	Qtr 1	February	16
2022	Qtr 1	March	29
Total			296

OCPHS Respiratory Surveillance Report - ILI

Influenza and RSV Weekly Summary:

- Emergency ILI percentage continues to be over the epidemic threshold (2.5%). The 7-day rolling ILI percentage was up from 4.42% to 8.35%.
- A large number of positive Influenza A and RSV tests were collected.
- Seven new ILI outbreaks in schools, mostly elementary schools.
- Seven new RSV hospitalizations, mostly pediatric.

Percent of Emergency Visits for ILI: SE MN, 21-22



Conclusion & Next Steps

Feedback from the Olmsted County Public Health Director

“I attended a meeting with several of the other Public Health Directors from SE MN and they are beyond excited to be able to obtain this data. Small counties just do not have the same infrastructure and resources, so you are helping to clean up some of the inequities with access to real time data. Awesome work!” - Denise Daniels, OCPHS Director

“It will give us more real time data to help us understand better what’s happening related to health risks in our community, and so in return it will help us make data-driven decisions around program planning, where we’re prioritizing our resources, what are the actual needs of our community,” Olmsted County Public Health director Denise Daniels said.

<https://www.olmstedcounty.gov/government/county-news-events/county-news/Olmsted-County-Public-Health-Services-awarded-funding-to-improve-regional-data-and-epidemiology>

Next Steps: Expanding Syndromic Surveillance to SE Minnesota

Olmsted County Public Health Services awarded funding to improve regional data and epidemiology

NEWS / JUN 1, 2022

Olmsted County Public Health Services (OCPHS) is receiving a \$388,000 grant from the Minnesota Department of Health (MDH) Infrastructure Fund to support data and epidemiology capabilities.

<https://www.olmstedcounty.gov/government/county-news-events/press-releases/Olmsted-County-Public-Health-Services-awarded-funding-to-improve-regional-data-and-epidemiology>

Next Steps for OCPHS

- Automate reports for 10-12 additional counties in the SE Region. Set up an API connection from ESSENCE to Power BI.
- Create reports and dashboards for other chronic and infectious conditions.
- Complete hiring process for a third syndromic epidemiologist.
- Complete onboarding for ~5 additional facilities in the SE Region.

MDH syndromic surveillance resources

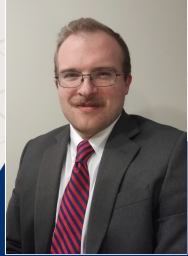
MDH Syndromic Surveillance web page
(<https://www.health.state.mn.us/communities/injury/data/sys.html>)

Q&A

Thank you.

Heidi Jonson: heidi.jonson@state.mn.us

Matthew Giljork: matthew.giljork@olmstedcounty.gov



Scott Johnston, MPH
Kansas Department of Health and
Environment



Communicating Overdose Alerts to Local Jurisdictions in Kansas

Scott Johnston, MPH; Danielle Sass, MPH | December 6, 2022

Overview

- **Definitions and Data Sources**
- **Background**
 - Spike and Cluster Analysis
 - Distinction from ESSENCE Alerts
- **Methods**
 - Summary of Alert Criteria
 - Communicating Alerts to Local Jurisdictions
 - Follow-up Meetings
- **Results**
 - Summary of Alerts
 - Changes of Alerts Over Time
 - Dashboard
- **Summary, Limitations, and Future Work**

Definitions and Data Sources

- **Kansas Syndromic Surveillance Program – ESSENCE**

- Contains data on 98% of Emergency Department Visits in Kansas

Drug Overdose Queries

- Drug CCDD Category
 - CDC All Drug v2
 - CDC Opioid Overdose v3
 - CDC Heroin Overdose v4
 - CDC Stimulants v3 (Includes Cocaine)
 - CDC Benzodiazepine v1
- Has been Emergency = Yes
- Patient Region = All Kansas Counties – based on Patient zip/county
- Fatal and Non-fatal

Background – Monitoring of Overdose Anomalies

- **Spike Analysis**

- Regular analysis on the county level of ESSENCE ED visit numbers across 5 drug categories, both fatal and non-fatal
 - CDC All Drug v2
 - CDC Opioid Overdose v3
 - CDC Heroin Overdose v4
 - CDC Stimulants v3 (Includes Cocaine)
 - CDC Benzodiazepine v1
- Monthly comparison of standard deviation of previous 3-month mean and count of most recent month

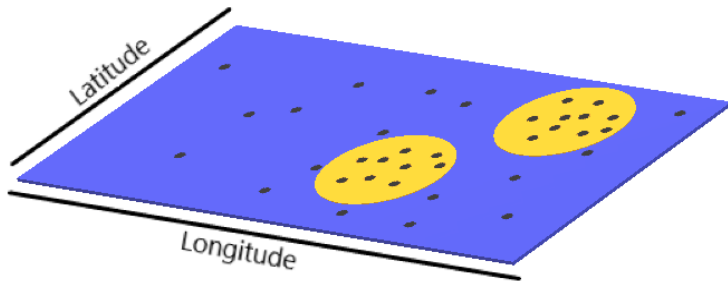
	July Count	August Count	September Count	3-Month Mean	October Count	Std. Devs from Mean	Std. Devs ≥ 2 ?
County A	23	28	27	26.0	43	6.4	Yes
County B	54	33	33	40.0	53	1.1	No
County C	18	21	19	19.3	16	-2.3	No

Background – Monitoring of Overdose Anomalies

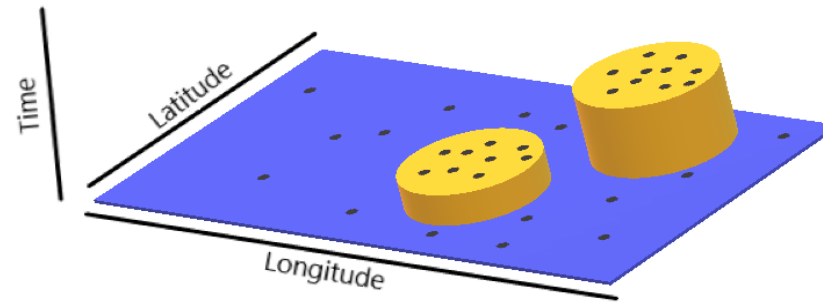
- **Cluster Analysis**

- Conduct cluster analysis using SaTScan, pull data concurrently with spike analysis
 - Cases aggregated into each month across 5 drug categories
 - SaTScan identifies many potential clusters by comparing the observed number of overdose ED visits inside the circle to what would be expected based on the average rate and the background population
 - P-value generated to determine statistical significance

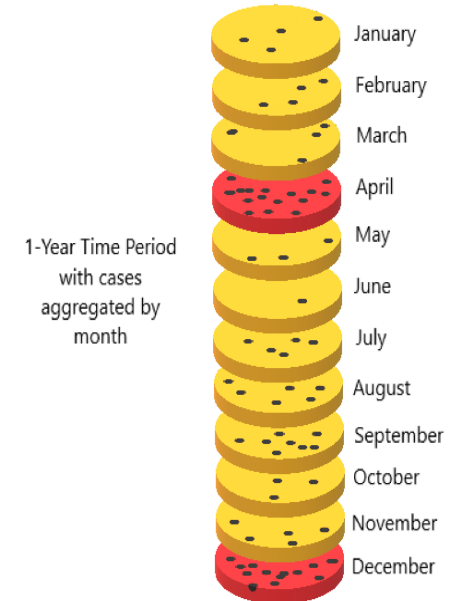
Spatial Analysis



Space-time Analysis



Example of Space-time Clusters



Background – Monitoring of Overdose Anomalies

Distinction from Built in ESSENCE Alerts

Cluster Analysis (using SaTScan)

- Directs attention to anomalies for further action/investigation
 - Situational Awareness Only
- Cluster analysis uses population data and 1-year history of ED visit data
 - *Discrete Poisson Model*
 - Cases
 - Population
 - Location info
- Customizable with several advanced options and different models that can be used

Cluster Alerting Algorithms (in ESSENCE)

- Directs attention to anomalies for further action/investigation
 - Situational Awareness Only
- Has built in cluster analysis similar to SaTScan
 - *Space-time Permutation Model*
 - Cases
 - Location Info
 - (no population info)

Methods – Alert Criteria and Communication

Summary of Alert Criteria for a County

- An overall spike in ED visits for a category – greater than 2 standard deviation increase in visits over previous 3-month mean

and

- A significant cluster of ED visits predominantly in the same county for the same drug category

Communicating Alerts to Local Jurisdictions

- Send alert email out to Local Health Department Contacts
 - Current iteration of alert document includes
 - Background Methods
 - Spike Table – monthly counts, 3-month mean, std. devs from mean
 - Cluster Table – description of any significant clusters, observed ED visits, expected visits, p-value, location info
 - Map of county and clusters
 - Age and Sex distribution graph
 - Actionable steps list and contact info

Methods – Follow-up Meetings

- Invitations are sent to meet and discuss the alert, any actions taken in response, and overdose prevention in general, is extended to Local Health Departments that received alert emails
 - Discuss information that was helpful
 - Things that may be missing
 - Actions that have been taken, if any
 - Barriers to action
- Semi-structured interview process with prompts, but tend to be more conversational
 - Short 30 minute sessions with invitation to follow-up if necessary

Results – Summary of Alerts

- 15 Months of Analysis – August 2021 through October 2022
 - 14 County Alerts across 8 counties
 - *Sedgwick*
 - *Reno*
 - *Shawnee*
 - *Miami*
 - *Franklin*
 - *Kingman*
 - *Wyandotte*
 - *Anderson*
 - Each of the 14 alerts typically included one drug category – 3 of them included two drug categories

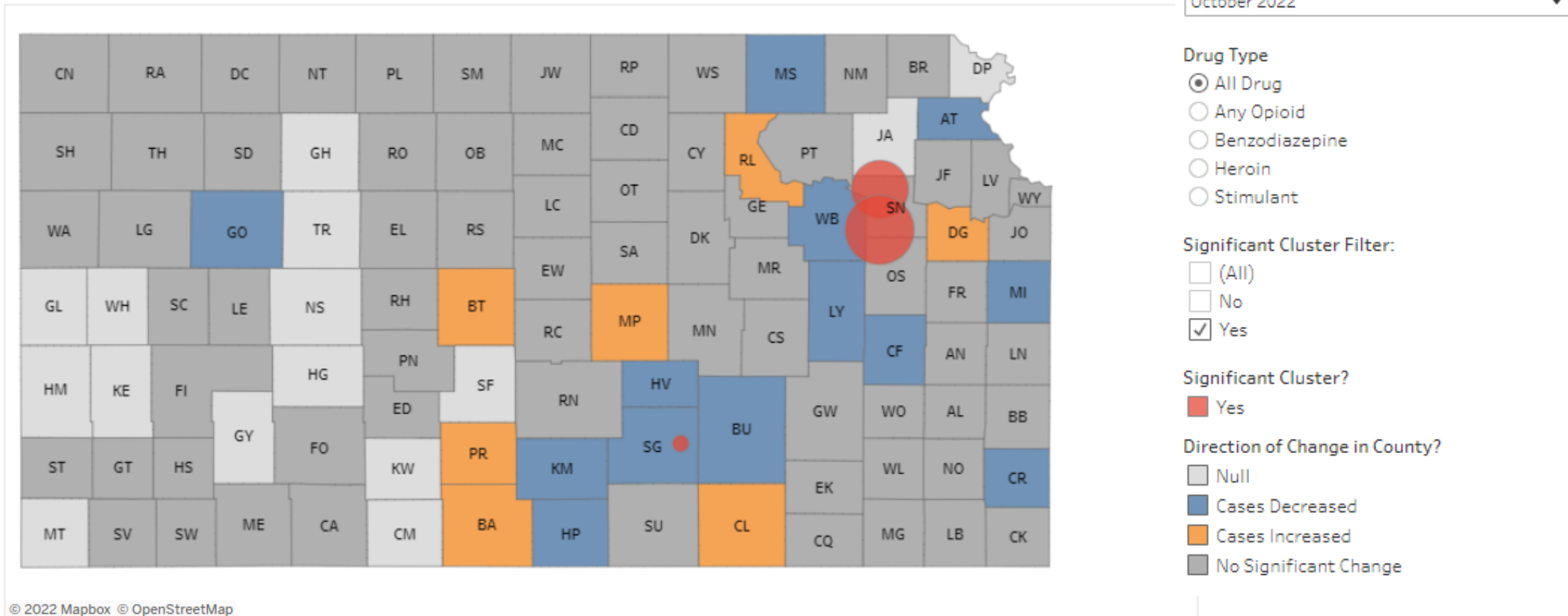
Results – Feedback and Changes to Alert Emails

- 6 meetings with 5 counties
 - All 5 LHDs have plans to expand work and partnerships in overdose prevention
 - One LHD has responded to the alert by conducting a naloxone training with Law Enforcement and Public Service Partners
 - One LHD had plans to use data from the alert to help justify expanding ODMAP use in their county
 - LHDs suggested adding additional variables to the alert documents such as sex and age, and requested additional ideas and resources on how they can respond to overdose increases in their communities
- Changes to Alert Emails Over Time
 - Added map of county with overlaid clusters, improved table with count information over previous months, added graph with age and sex distribution, etc.

Results – Dashboard

- In September 2022, a spike and cluster analysis tab was published to the Kansas Department of Health and Environment Overdose Data Dashboard – updated monthly

All Drug Overdose ED Visit Spike and Cluster Alert Map, October 2022



Summary, Limitations, and Future Work

- ESSENCE is analyzed monthly for overdose ED visit county-wide spikes and clusters across 5 drug categories based on patient location
- Spikes in visits greater than 2 standard deviations above previous 3-month mean, combined with a significant cluster, indicate an alert
- 14 Alert Emails have been distributed in 15 months across 8 counties
- Data has also been published to a public dashboard as of September 2022
- Limitations
 - Doesn't count overdoses where the patient died before transport, refused transport, or otherwise never made it to the ED
 - Based on Patient Location
 - Primarily useful for situational awareness
- Future Work
 - Overdose Alert Response Toolbox in progress— a collection of resources, contact information, example interventions, and other tools that local health departments or other partners can use in responding to overdose alerts or for general overdose prevention work.

References

1. Kansas Syndromic Surveillance Program, ESSENCE
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See KDHE Overdose Data Dashboard for full technical notes and additional data: <https://www.kdhe.ks.gov/1309/Overdose-Data-Dashboard>



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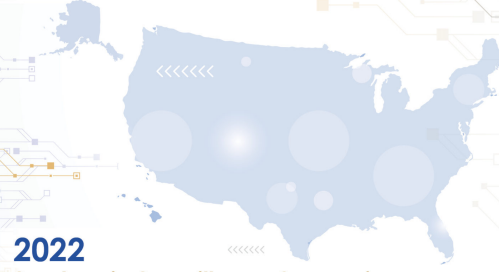
Thank You/Questions



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