Data That's Engaging for All

Utilizing Alternative Technologies to Present and Disseminate Health Surveillance Data

Samantha M. Saycich, MPH

Monday, April 1st | Breakout Session #2 | 3:00-3:30pm

DEPARTMENT OF PUBLIC HEALTH & HUMAN SERVICES

Introduction

DEPARTMENT OF PUBLIC HEALTH & HUMAN SERVICES

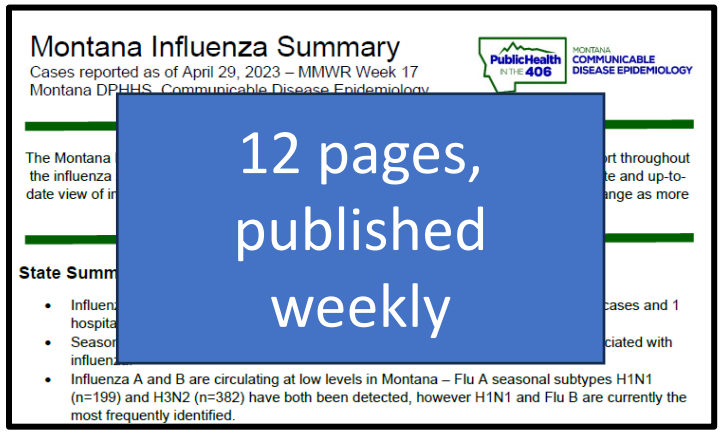
Montana Communicable Disease Epidemiology Section (CDEpi)

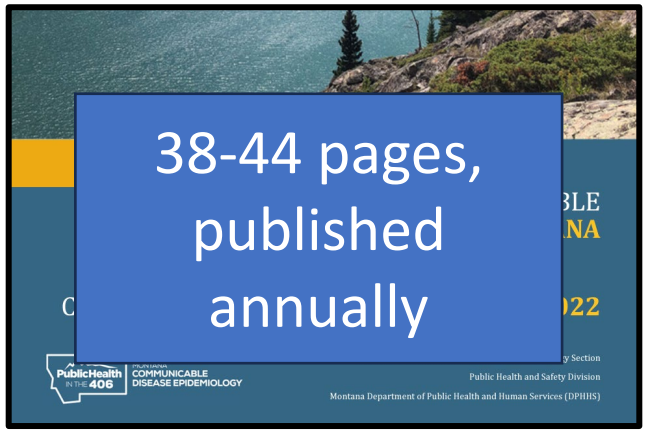
- Housed in the **Public Health and Safety Division**
- Epidemiology= the study and analysis of the distribution, patterns, and determinants of health
- Responsible for **creating, maintaining, supporting, and strengthening** routine surveillance and detection systems for communicable diseases
- Assist in the investigation of cases and outbreaks of communicable diseases well as assisting in the response to incidents of public health significance

PublicHealth IN THE 406

MONTANA COMMUNICABLE DISEASE EPIDEMIOLOGY

What's the Problem?





- CDEpi generates numerous reports summarizing key epidemiological findings for different conditions we monitor
- COVID-19 pandemic made it so that more Montanan's were interested in data related to communicable disease, but our only methods for presenting the data were through reports or presentations
- We serve customers with varying backgrounds: public health officials, healthcare workers, and the public

What's the Problem?

Who is Affected?

- Individual community members
- Clinical care teams
- Owners/managers of congregate living facilities
- Public health officials

How Big is the Problem?

- For the previous flu season (2022-2023), our report averaged between 334 and 23 weekly views, with an average of 112 views a week.

What Contributes to the Problem?

- The report is dense and very analytical
- Visuals in the report are complex
- It's hidden within a "reports" section of our website

When and Where is the Problem Most Likely to Occur?

- Respiratory season (MMWR weeks 40-22)

"Montana's influenza surveillance data has a low engagement rate, with just over 110 individuals a week opening the 12-page report. To help improve community awareness, independence, and well-being, we need this data to be easily understood, accessible, and able to reach a larger audience."

What's the Problem?

- Reports are still useful tools!
  - Remains the best way for CDEpi to summarize annual communicable disease activity for over 70 reportable conditions.
  - Having a narrative can help interpret the data for stakeholders and guides a call to action.

The Problem: Poor mental well-being affects thousands of Montanans. One in ten Montana adults (nearly 84,000) report frequent mental distress with 14 or more days of poor mental or emotional health in the past month.[3] Further, 41,000 Montana adults have serious mental illness.[4] Suicide, a mental health crisis, continues to affect every Montana community. Suicide-related deaths in Montana are two times higher than the U.S. An average of 240 suicide deaths occurred each year in Montana from 2011-2015.5 The suicide rate was significantly higher in rural counties (population less than 10,000) compared to micropolitan (population between 10,000 and 49,999 people) counties.6 The proportion of American Indian high school students who reported that they had attempted suicide in the past year was nearly two times higher (18%) than youth overall in Montana (10%).7 Nearly 64,000 Montana adults struggle with substance use disorder (SUD).8 Alcohol is the most commonly abused substance in Montana. Use of illicit drugs like marijuana, cocaine, or heroin in Montana follows similar trends as the U.S. Methamphetamines continue to be a major concern in Montana; however, data regarding usage are limited, particularly among Montana's adult population. Among Montana youth, 2.2% of high school students reported having used methamphetamines during their lifetime.7 Opioids are the leading cause of drug overdose deaths in Montana, accounting for 44% of all drug overdose deaths. Access to treatment for both SUD and mental health is limited in Montana. Between 2015 and 2016, an estimated 73,500 Montanans aged 12 years and older (8%) needed but did not receive treatment for substance use in the past year.8 From 2010 to 2014, only 39% of adolescents aged 12 to 17 years with a Major Depressive Episode received treatment within the last year.9 It is vital that health care providers are educated on delivery of care from a trauma-informed perspective, particularly in regards to historical trauma within the American Indian communities. The U.S. Administration for Children and Families defines historical trauma as "multigenerational trauma experienced by a specific cultural, racial, or ethnic group."41 Trauma-informed care emphasizes "understanding, recognizing, and responding to the effects of all types of trauma in order to provide physical, psychological, and emotional safety for both consumers and providers."42

How to Make Data Engaging

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Considerations

Your Audience

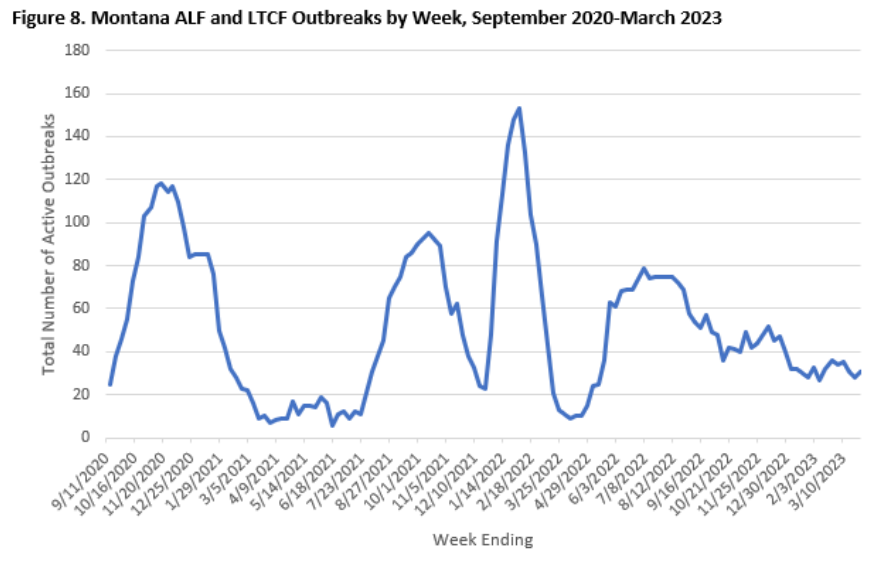
Is your analysis intended for a specific group of people? Or should it be easily digestible by members of the public?

Your Message

What is the message that you want viewers to walk away with after reading about/seeing your data? What is your call to action?

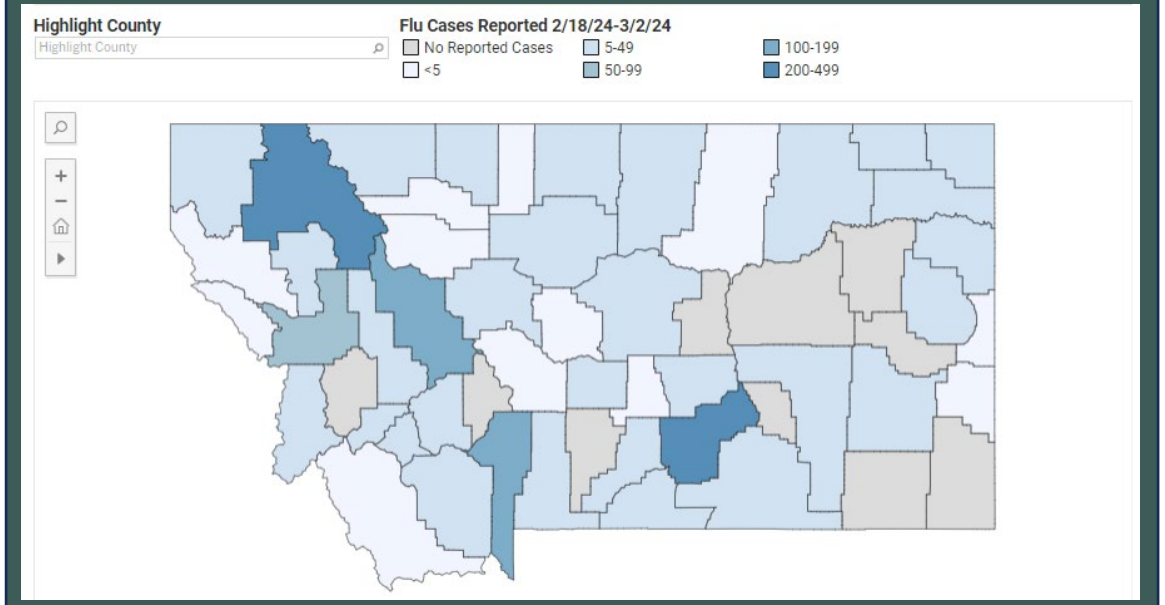
Best Practices

Keep Visuals Simple



Prevent mental fatigue! Simple visuals draw the viewers in. Remove extra clutter and only highlight the data you are talking about in your report or presentation.

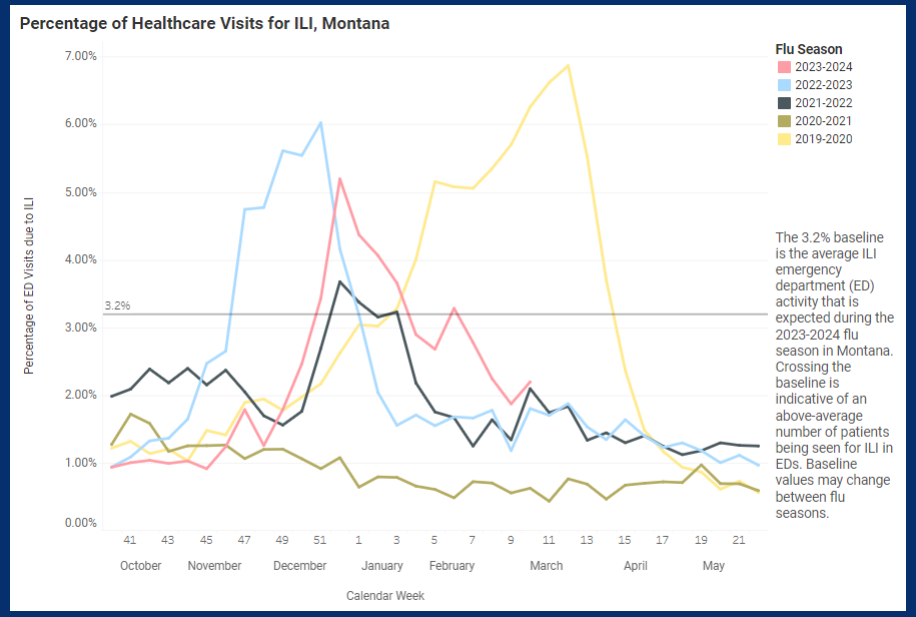
Use Fewer Colors



Too much color can be overwhelming and become a distraction. Keep colors from the same color "family" when possible and verify they are color-blind friendly and good to print in black and white.

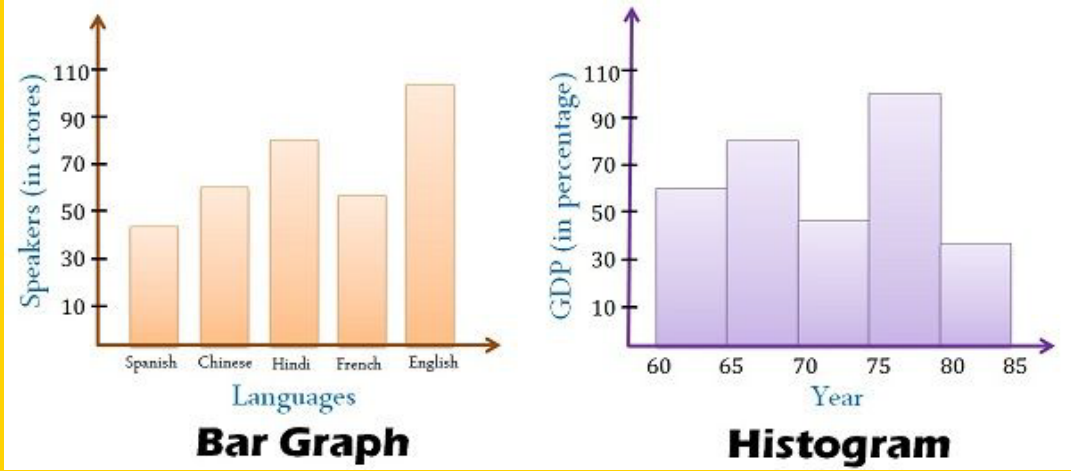
Best Practices

Utilize a Navigation Aid



Using a legend or a navigation aid can help viewers understand the takeaway of the data being presented.

Choose the Appropriate Chart

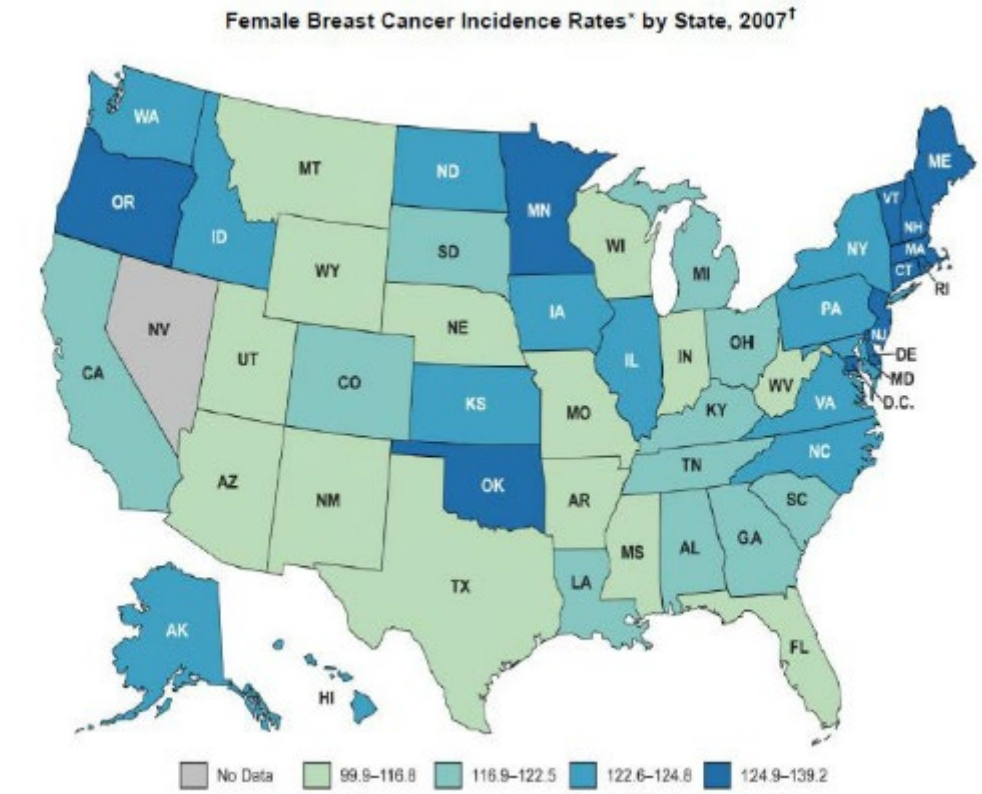


Carefully choose an appropriate chart/visual to convey the message that you want viewers to take away from your data.

Mapping

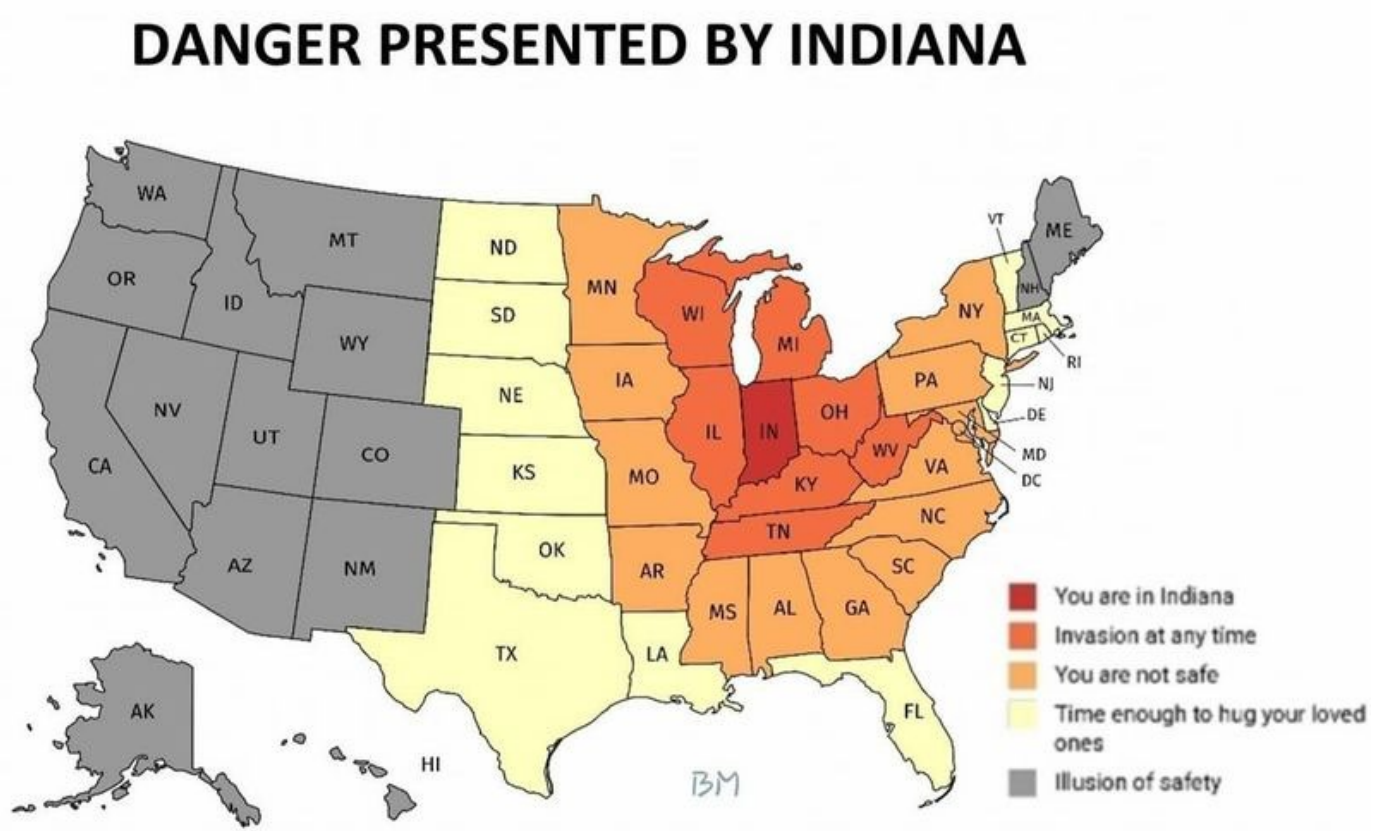
- A great tool to display data spatially to identify trends over a geographical location
- Visually shows trends and disparities to help guide and develop policy
- Considerations:
  - Patient confidentiality- e.g., releasing information that there was one death due to influenza in a county like Petroleum may result in inferential identification of the patient by other community members.
  - Fallacies- Just because you CAN map something doesn't mean you SHOULD. Careful when comparing variables!

Mapping

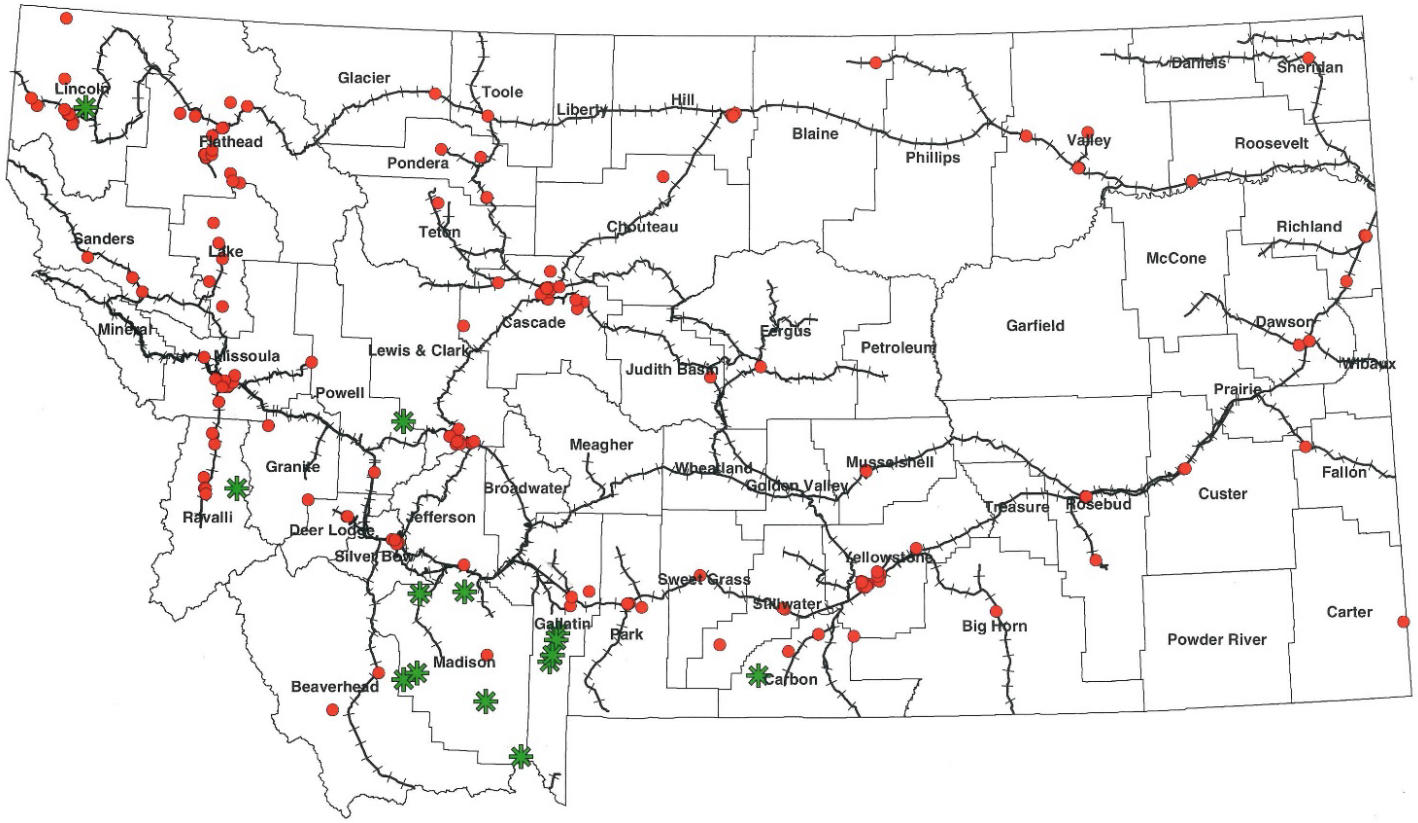


Female Breast Cancer Incidence Rates by State, 2007 U.S. Cancer Statistics Working Group. United States Cancer Statistics: 1999–2007 Incidence and Mortality Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2010. Available at: http://www.cdc.gov/uscs., March 19, 2024.

When Mapping Goes Wrong



When Mapping Goes Wrong



Mesothelioma Cases

- Individual Cases

Rail Roads

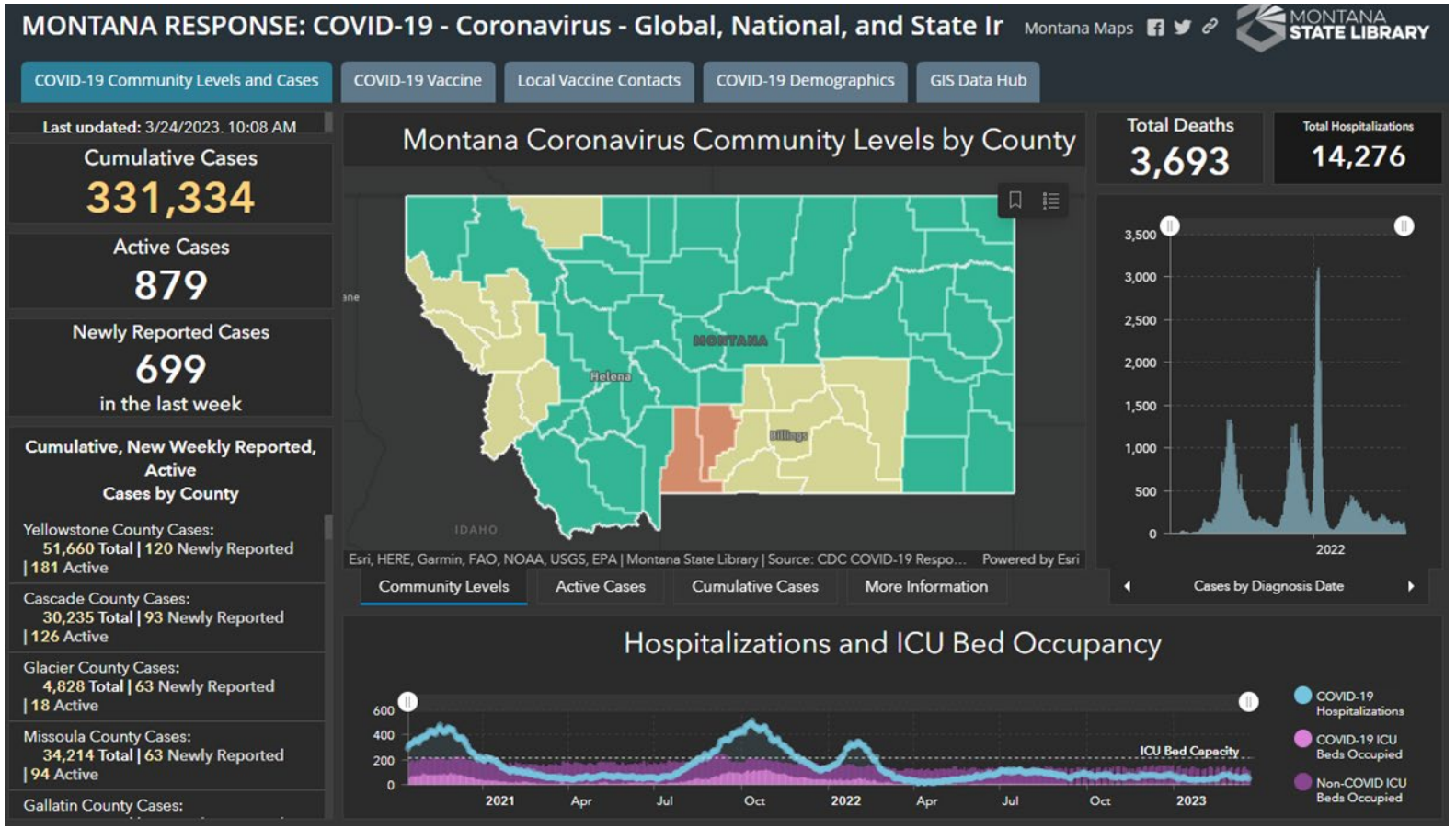
- Rail Roads as of 1965

Mines

- Vermiculite and/or Asbestos Mines

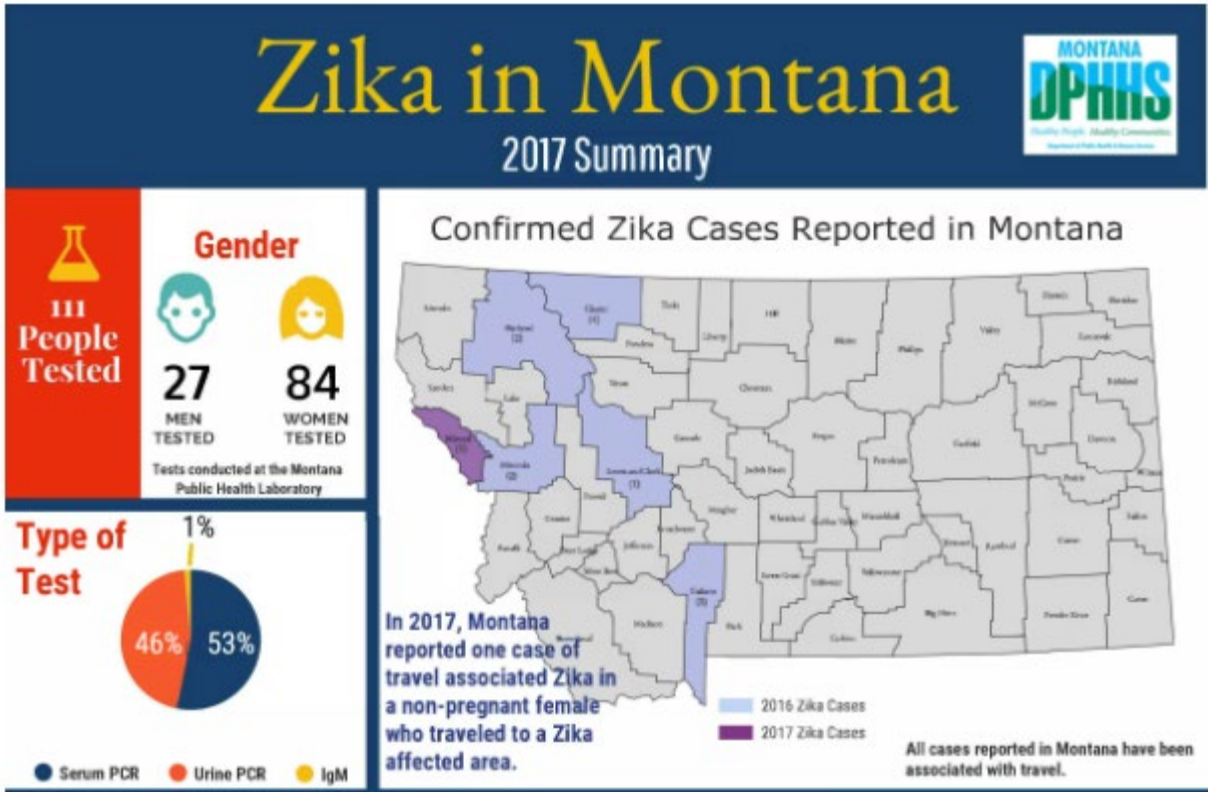
Technology Used by CDEpi in Recent Years

ArcGIS Pro



- Created by Montana State Library
- CDEpi supplied COVID-19 data and the library mapped it
- Interactive, simple, and informative

Canva



- Used to make infographics
- Mapping is manual with Canva
  - Not great for in-depth analysis
- Tricky- we are not trained in graphic design!

Dashboard Development and Success

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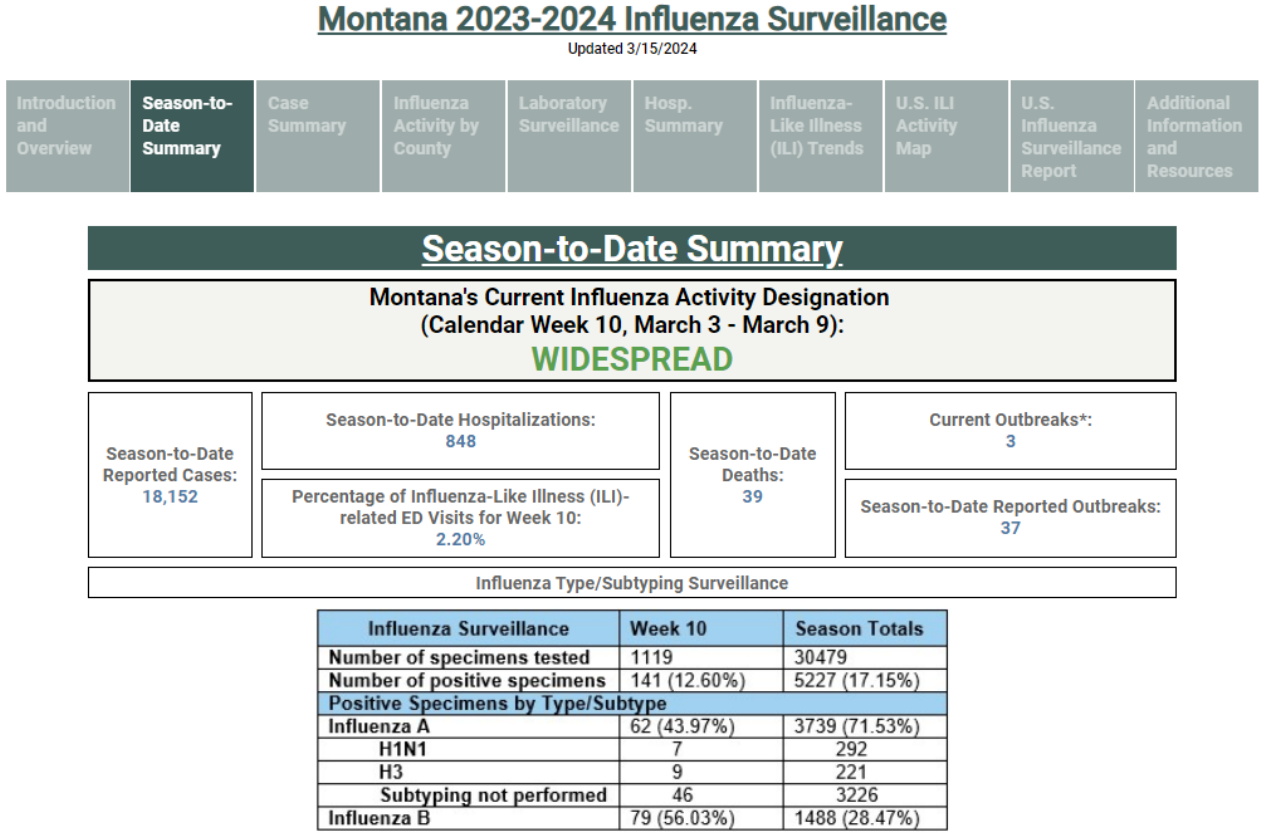
Problem Statement, Solution, and Goal

Problem: Montana's influenza surveillance data has a low engagement rate, with just over 110 individuals a week opening the 12-page report. To help improve community awareness, independence, and well-being, we need this data to be easily understood, accessible, and able to reach a larger audience.

Solution/Goal: Create an interactive dashboard to display surveillance data for our "big 3" respiratory conditions (COVID-19, influenza, and RSV) to increase views by at least 200%.

Tableau



Montana 2023-2024 Influenza Surveillance

Updated 3/15/2024

Introduction and Overview | **Season-to-Date Summary** | Case Summary | Influenza Activity by County | Laboratory Surveillance | Hosp. Summary | Influenza-Like Illness (ILI) Trends | U.S. ILI Activity Map | U.S. Influenza Surveillance Report | Additional Information and Resources

Season-to-Date Summary

Montana's Current Influenza Activity Designation (Calendar Week 10, March 3 - March 9):

WIDESPREAD

Season-to-Date Reported Cases: 18,152

Season-to-Date Hospitalizations: 848

Percentage of Influenza-Like Illness (ILI)-related ED Visits for Week 10: 2.20%

Season-to-Date Deaths: 39

Current Outbreaks*: 3

Season-to-Date Reported Outbreaks: 37

Influenza Type/Subtyping Surveillance

Influenza Surveillance	Week 10	Season Totals
Number of specimens tested	1119	30479
Number of positive specimens	141 (12.60%)	5227 (17.15%)
Positive Specimens by Type/Subtype		
Influenza A	62 (43.97%)	3739 (71.53%)
H1N1	7	292
H3	9	221
Subtyping not performed	46	3226
Influenza B	79 (56.03%)	1488 (28.47%)

- Home-grown
- Two dashboards created in the fall of 2023:
  - Influenza
  - Pan-Respiratory Surveillance
- Replaced the 12-page flu report that was published weekly
- Easy to update since it's an embedded code on our website

Tableau- Flu Dashboard

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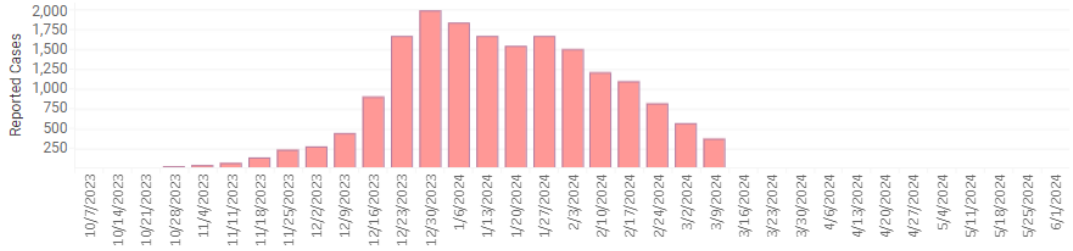
Case Summary

MTDPHHS defines a case of influenza as an individual who has laboratory testing confirming active infection. Key surveillance partners (e.g., hospitals, urgent cares, long-term care facilities) in Montana report laboratory-confirmed cases of influenza to their local health jurisdictions. Local health jurisdictions report the total number of laboratory-confirmed cases of influenza in their jurisdiction to MTDPHHS on a weekly cadence. These data are reflected in the figures below.

Total Influenza Cases Reported by Calendar Week, Montana, 2023-2024



Tip: Select a bar above to filter information on the "Comparison of Influenza Cases by Seasons" graph for comparison.

Comparison of Influenza Cases by Seasons, Montana 2019-2024

Montana 2023-2024 Influenza Surveillance

Updated 3/15/2024

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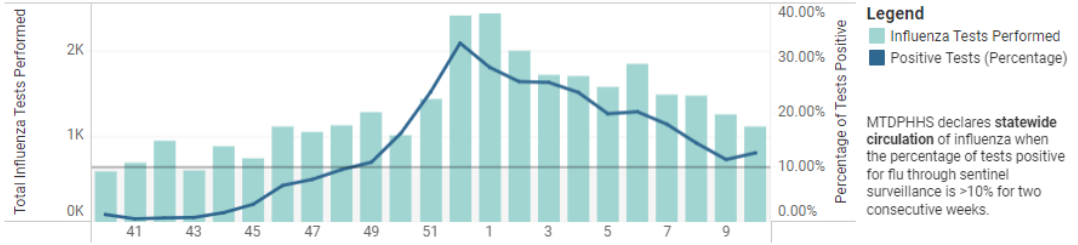
Influenza (Flu) Testing Summary

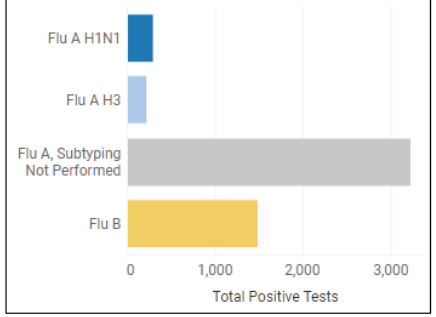
Laboratory surveillance for influenza in Montana is compiled from voluntary sentinel laboratories, which report testing information weekly. These laboratories include: Barrett Hospital and Healthcare, Big Sandy Medical Center, Bighorn County Hospital, Billings Clinic Hospital, Bozeman Deaconess Hospital, Cabinet Peaks Medical Center, Community Medical Center, Deer Lodge Medical Center, Great Falls Clinic, Holy Rosary Health Care, Liberty County Hospital, Livingston Health, Logan Health, Phillips County Hospital, Poplar Community Hospital, Madison Valley Medical Center, North Valley Hospital, St. Peter's Hospital, St. Vincent Hospital, Trinity Hospital, and VA Ft. Harrison.

Total Number of Flu Tests Performed and Percentage of Tests Positive for Flu by Calendar Week -- Montana, 2023-2024

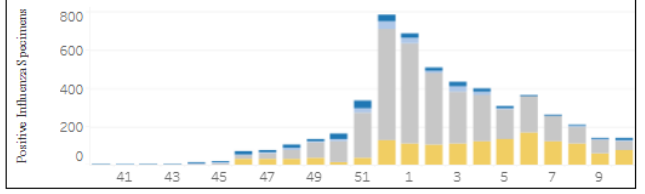


MTDPHHS declares **statewide circulation** of influenza when the percentage of tests positive for flu through sentinel surveillance is >10% for two consecutive weeks.

Flu Type and Subtype Distribution for the 2023-2024 Season -- Montana



Positive Flu Specimens Type and Subtype Weekly Distribution -- Montana, 2023-2024



Flu Type/Subtype

- Flu A H1N1
- Flu A H3
- Flu A, Subtyping Not Performed
- Flu B

Week Ending

10/7/2023 — 3/9/2024

Tableau- Flu Dashboard

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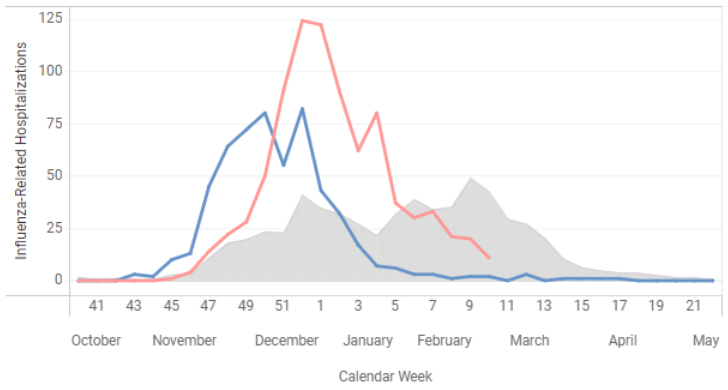
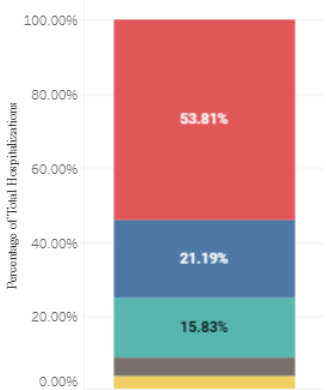
Hospitalization Summary

MTDPHHS defines a hospitalization due to influenza as an individual admitted to the hospital for at least 24 hours due to complications associated with a laboratory-confirmed influenza infection. The hospitalization must occur either 14 days or less *after* a positive influenza test OR 3 days or less *before* a positive influenza test to be counted below. The graph below compares hospitalizations for this current season (2023-2024) with the previous season (2022-2023) and the average of the previous 5 years by calendar (MMWR) week. The pink line represents hospitalizations for the current 2023-2024 season and the dark blue line represents hospitalizations in the 2022-2023 season (550 hospitalizations total). The 5-year average (shown in gray) was caculated by averaging the weekly hospitalizations that occurred during the following flu seasons: 2017-2018, 2018-2019, 2019-2020, 2021-2022, and 2022-2023. Data from the 2020-2021 season were excluded from this analysis due to no influenza cases, hospitalizations, or deaths being reported during that season.

Number of Influenza-Related Hospitalizations Reported (All Ages) -- Montana



Total Hospitalizations by Age Group for the 2023-2024 Influenza Season



Legend
- 2023-2024
- 2022-2023 (n=550)
- 5 Year Average (2017-2023)

Note: Eight (8) hospitalizations occurred in September of 2023 prior to the official "start" of active influenza surveillance (October 1, 2023). These hospitalizations are not reflected in the graph above but are reflected in the total hospitalizations count on the Season-to-Date Summary Page.

Age Group
- 65+ yr
- 50-64 yr
- 18-49 yr
- 5-17 yr
- 0-4 yr

Montana 2023-2024 Influenza Surveillance

Updated 3/15/2024

Introduction and Overview | Season-to-Date Summary | Case Summary | **Influenza Activity by County** | Laboratory Surveillance | Hosp. Summary | Influenza-Like Illness (ILI) Trends | U.S. ILI Activity Map | U.S. Influenza Surveillance Report | Additional Information and Resources

Influenza Activity by County

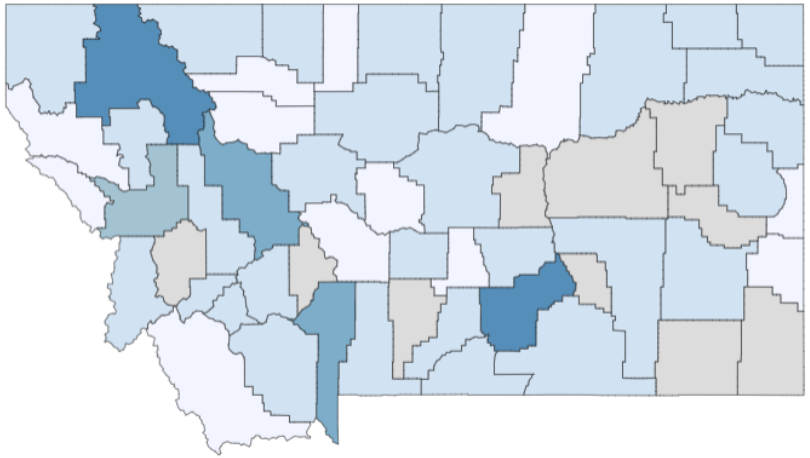
This map displays the geographic spread of recent influenza activity in Montana. Data are presented in 2-week intervals as the result of a low volume of cases being reported to ensure patient confidentiality. Data for this map reflects the total number of influenza cases reported between 2/18/24 and 3/2/24 (calendar weeks 8 and 9) by the patient's county of residence.

This map was updated on 3/8/2024.
This map will be updated again on 3/22/2024 to display flu data for 3/3/2024-3/16/2024.

Highlight County

Highlight County

Flu Cases Reported 2/18/24-3/2/24
- No Reported Cases
- <5
- 5-49
- 50-99
- 100-199
- 200-499



Color indicates the total number of flu cases reported between 2/18-3/2, 2024. For mapping purposes, influenza case counts from tribal jurisdictions have been included with the primary overlapping county: Crow is included with Big Horn, Blackfoot with Glacier, Rocky Boy with Hill, CSKT with Lake, Fort Peck with Roosevelt, Northern Cheyenne with Rosebud, and Fort Belknap with Blaine.

Tableau- Pan-Respiratory Dashboard

Montana 2023-2024 COVID-19, Influenza, and RSV Surveillance

Updated 3/8/2024

Introduction and Overview | **Season-to-Date Summary** | Outbreaks in Healthcare Settings | Outbreaks in Non-Healthcare Settings | Trends in ED Visits | COVID Summary | COVID Variants-CDC | Flu Summary | RSV Testing Summary | Additional Resources

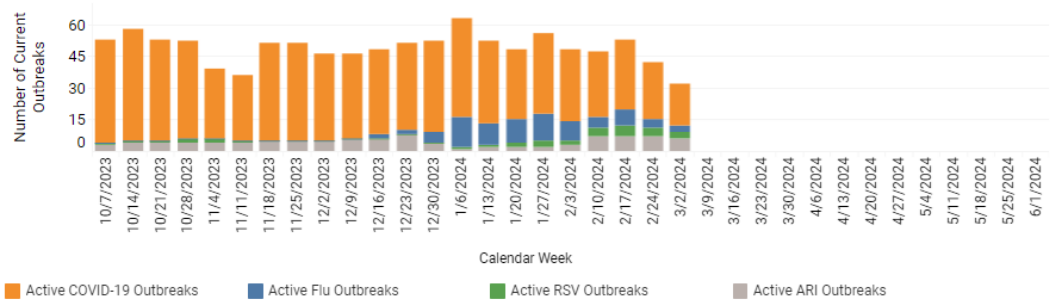
Season-to-Date Summary
10/1/2023-3/2/2024

COVID-19 Summary	Flu Summary	RSV Summary
Season-to-Date Reported Cases: 13,854	Season-to-Date Reported Cases: 17,783	Season-to-Date Reported Deaths in Children <5 Years: 0
Season-to-Date Reported Hospitalizations: 686	Season-to-Date Reported Hospitalizations*: 814	
Season-to-Date Reported Deaths: 77	Season-to-Date Reported Deaths*: 38	

Outbreak Summary

Current Outbreaks: 32	Newly Reported Outbreaks: 4	Season-to-Date Outbreaks: 277

The Number of Currrent Outbreaks of Respiratory Illness in All Facilities by Week



*Eight hospitalizations and two deaths due to influenza occurred in September of 2023 and are included in the total season-to-date reported counts.

Current Outbreaks: facilities that are currently responding to an outbreak in their facility.
New Outbreaks Reported This Week: facilities that identified and reported a new outbreak in their facility this week.
Season-to-Date Outbreaks: the total number of outbreaks reported in facilities since October 1, 2023.
Note: Outbreaks of respiratory illness are tracked year-round. For the purpose of this dasbhoard, "Season-to-Date" indicates data from October 1, 2023, through the date indicated on this dashboard.

Montana 2023-2024 COVID-19, Influenza, and RSV Surveillance

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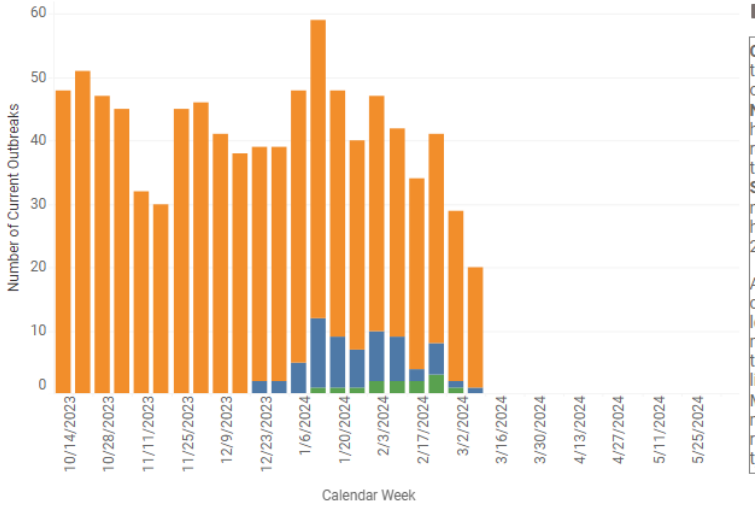
Outbreaks in Healthcare Settings
10/1/2023-3/2/2024

MTDPHHS works closely with jurisdictions in Montana to identify, track, and mitigate outbreaks of communicable diseases in healthcare settings. Facilities included in the healthcare setting definition used by MTDPHHS include, but are not limited to, facilities licensed as acute care, long-term care facilities (LTCFs), assisted living facilities (ALFs), critical access hospitals (CAHs), state healthcare facilities (SHFs), and other healthcare facilities. State healthcare facilities include: Montana State Hospital (MSH) in Warm Springs, Intensive Behavior Center (IBC) in Boulder, Montana Mental Health Nursing Care Center (MMHNCC) in Lewistown, Montana Chemical Dependency Center (MCDC) in Butte, Montana Veterans Home (MVH) in Columbia Falls, Southwest Montana Veterans Home (SWMVH) in Butte and Eastern Montana Veterans Home (EMVH) in Glendive.

Current Outbreaks: 20	New Outbreaks Reported This Week: 3	Season-to-Date Reported Outbreaks: 233

The Number of Current Outbreaks of Respiratory Illness in All Healthcare Settings (ALFs, LTCFs, CAHs, SHFs) by Week



Current Outbreaks: healthcare facilities that are currently responding to an outbreak in their facility.
New Outbreaks Reported This Week: healthcare facilities that identified and reported a new outbreak in their facility this week.
Season-to-Date Outbreaks: the total number of outbreaks reported in healthcare facilities since October 1, 2023.

Acute Respiratory Illnesses (ARIs) are conditions that affect the upper and/or lower respiratory tract. These conditions may be of unknown etiology (cause) or they may be due to a condition that is not listed directly in Administrative Rule of Montana 37.114.203, such as human metapneumovirus, parainfluenza virus, rhinoviruses, adenoviruses, and certain types of corona-viruses.

Tableau- Pan-Respiratory Dashboard

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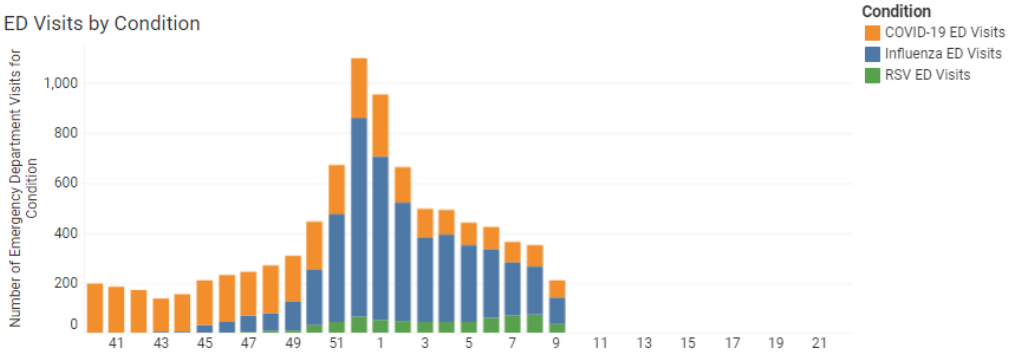
Trends in Data from Emergency Department Visits

MTDPHHS utilizes data from emergency departments **(ED)** to monitor trends in respiratory activity in Montana. Public health officials can detect unusual or elevated levels of illness by tracking the discharge diagnosis or the symptoms of patients in EDs before a diagnosis may be confirmed. This type of surveillance is called "syndromic surveillance". Data obtained through syndromic surveillance can help detect early outbreaks of respiratory illness in Montana. Montana uses the Electronic Surveillance System for the Early Notification of Community-Based Epidemics **(ESSENCE)** to collect data for syndromic surveillance.

Total Number of (ED) Visits and Proportion of Those Visits Due to Respiratory Illness, Montana 2023-2024

Week	All ED Visits	Percentage of All ED Visits Due to Respiratory Illne..
10/1/2023-10/7/2023	7,059	2.86%
10/8/2023-10/14/2023	7,076	2.64%
10/15/2023-10/21/2023	7,133	2.45%
10/22/2023-10/28/2023	6,453	2.17%
10/29/2023-11/4/2023	6,612	2.37%
11/5/2023-11/11/2023	6,792	3.15%
11/12/2023-11/18/2023	6,939	3.37%
11/19/2023-11/25/2023	6,828	3.59%

ED Visits by Condition



For more information on syndromic surveillance in Montana, please visit: https://dphhs.mt.gov/publichealth/meaningfuluse/index

Montana 2023-2024 COVID-19, Influenza, and RSV Surveillance

Updated 3/8/2024

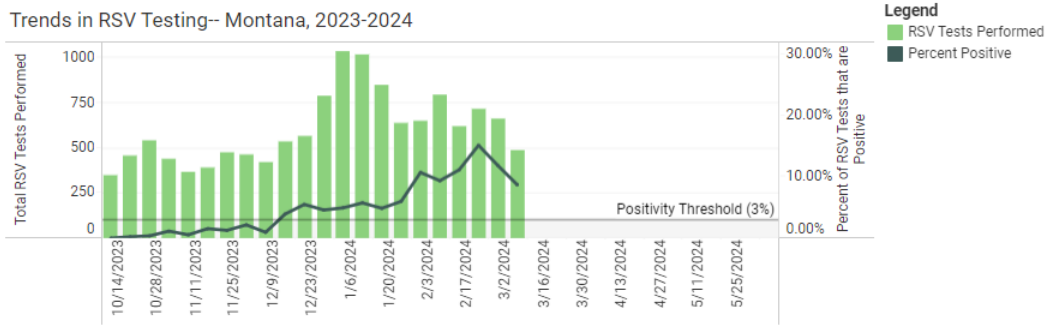
Introduction and Overview | Season-to-Date Summary | Outbreaks in Healthcare Settings | Outbreaks in Non-Healthcare Settings | Trends in ED Visits | COVID Summary | COVID Variants-CDC | Flu Summary | **RSV Testing Summary** | Additional Resources

Trends in RSV Testing, Montana 2023-2024

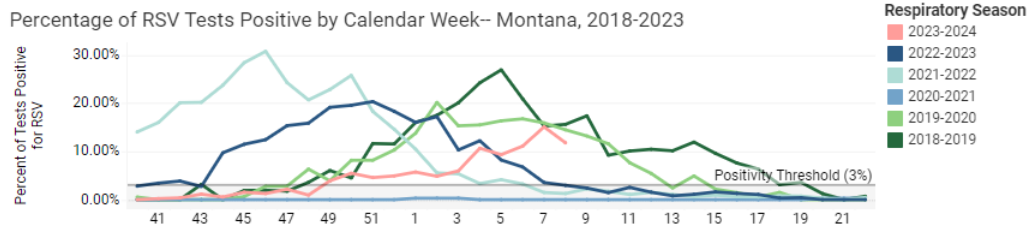
Individual cases of RSV are not reportable in Montana. Surveillance for RSV in Montana is compiled from voluntary sentinel laboratories, which report testing information weekly. Percent positivity for RSV is determined by the number of positive RSV tests resulting from the total number of RSV tests run.

The 10% **positivity rate threshold** previously used to determine the onset of RSV season was lowered to a 3% positivity threshold (over two consecutive weeks) in 2022-2023. RSV season onset is defined as the first of two consecutive weeks when the weekly percentage of tests positive for RSV is >3%.*

Trends in RSV Testing-- Montana, 2023-2024



Percentage of RSV Tests Positive by Calendar Week-- Montana, 2018-2023



*Midgley, C. M., Haynes, A. K., Baumgardner, J. L., Chommanard, C., Demas, S. W., Prill, M. M., Abedi, G. R., Curns, A. T., Watson, J. T., & Gerber, S. I. (2017). Determining the Seasonality of Respiratory Syncytial Virus in the United States: The Impact of Increased Molecular Testing. *The Journal of infectious diseases*, *216*(3), 345–355. https://doi.org/10.1093/infdis/jix275

Outcome

2022-2023 Metrics

- 2,706 total views
  influenza report
- Averaged 11
- Highest wee
- Lowest week

Viewership increased by 130% for the 2023-2024 season in total, and by over 430% for the month of January!

2023-2024 Metrics

n October 1, 2023-
2024

iews of the
shboard

258 views a

n 1/1-1/15, we
eceived 1,237 views (avg of
600 views per week)

Recommendations

Work With a Small Team to Determine the Best Way to Present Your Data

- Helps identify the overarching goals of the project.
- Is a dashboard the best method? A report? An infographic?
- Is the message clear and concise throughout the presentation?

Secure Leadership Buy-In Early in the Process

- Full support in transitioning the flu report to a dashboard from day 1.
- Communicate your vision clearly and include leaders in your decisions.
- Accelerates the project by ensuring that everyone is on the same page.
- Allowed us to get assistance quicker when we had roadblocks come up.

Lessons Learned

Training Took 2 Months and Required a TON of Troubleshooting	Dashboard Publishing Delayed- Unsure What Server and Software Access Was Needed	Difficult to Find Back-Up for Publishing Data When Out Of Office
↓	↓	↓
Factor In Training Time When Planning Your Anticipated Publish/Launch Day	Coordinate Early with IT and/or Web Staff to Discuss Technology and Software Requirements	Plan For Staff Outages and Train Other Staff

Open Discussion

1. What alternative technologies have you and your team used to disseminate data?

2. What are some challenges that you and your team have faced, or can anticipate facing, when trying to implement new technologies?

3. When do you think that a report would be more appropriate than a dashboard or infographic?

4. What other strategies or best practices can you think of that help when presenting information?

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Thank You!

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