Epi 101: Around the World of Communicable Disease

Public Health Summer Institute 2022

EPI 101: AROUND THE WORLD OF COMMUNICABLE DISEASE

COURSE DESCRIPTION- This course takes learners through a variety of infectious diseases while reviewing concepts integral to public health. Topics include case investigation, outbreak identification and management, public health reporting and MIDIS, using technology in public health investigations, and a brief After Action report of COVID-19.

Montana Department of Public Health and Human Services Staff Trainers

Bureau Chief of Epidemiology and Scientific Support Bureau/State Epidemiologist
- Laura Williamson, MPH

Communicable Disease Epidemiology (CDEpi) Section
- Ryan Weight, MPH
- Sam Saycich, MPH
- Helen McCaffrey, MPH
- Rachel Hinnenkamp, MPH
- Jessica Lopeman, MPH, BSN, RN-BC
- Meagan Gillespie, BS
- Devon Cozart, MPH, CPH
- Beth Hopkins

Infection Prevention/HAI Section
- Erika Baldry, MPH, CIC
- Samantha Carle
- Liz Adams
- Dianna Bowling
- Andrea Woody

Surveillance and Informatics Section
- Jennifer Rico, MA
- Danny Power, MPH, MPA

Sexually Transmitted Disease (STD) Section
- Cara Murolo

Local Health Jurisdiction Presenters
- CDR Dawn Benth, RN, BSN, MBA
- Hannah Tougas, BSN, RN

Montana Public Health Institute
- Hillary Hanson, MS, MPH

UM MPHTC Wellness Program
- Chelsea Kidd, CPT

Agenda

July 20, 2022 Module 1	8:00	Laura Williamson, Meagan Gillespie	Welcome and Housekeeping
	8:30	Hillary Hanson	Themes from Local and Tribal Mid-Pandemic Reviews
	9:30	Sam Saycich	Characteristics of COVID Surges in Montana
	10:00	Break	
	10:15	Jennifer Rico	Basic Epidemiology Concepts – The Big Problem of Small Numbers
	10:45	Sam Saycich	Public Health Reporting
	11:15	Helen McCaffrey	Interpreting Lab Reports
	11:30	Erika Baldry	Exploring Case Definition and Case Status
	12:00	Lunch	
July 20, 2022 Module 2	1:00	Chelsea Kidd	After Lunch Stretch
	1:15	Rachel Hinnenkamp, Devon Cozart	The Wild World of Outbreak Investigations in Montana
	2:30	Meagan Gillespie	Use of Technology in Investigations
	3:00	Break	
	3:15	Rachel Hinnenkamp, Devon Cozart, Meagan Gillespie	Exercise and Report Out
	3:45	Cara Murolo, Jessica Lopeman	Public Health Management of Syphilis
	4:25	Dawn Benth	Community Interventions and Challenges
	4:40	Hannah Tougas	Use of Technology in DIS Work
	4:55	Meagan Gillespie	Wrap-Up
July 21, 2022 Module 3	8:00	Meagan Gillespie	Welcome and Housekeeping
	8:10	Danny Power	Running Reports in MIDIS
	9:00	Infection Prevention/ HAI Section	The Wonderful World of Infection Control and Prevention
	10:00	Break	
	10:15	Jessica Lopeman	Vaccine Preventable Diseases
	11:15	CDEpi staff	Around the World with CD Epis!
	11:45	Meagan Gillespie	Post Test and Wrap Up

This nursing continuing professional development activity was approved by Montana Nurses Association, an accredited approver with distinction by the American Nurses Credentialing Center's Commission on Accreditation.

None of the planners, speakers, or others with the ability to control the content of this activity have relevant financial relationships to disclose with ineligible companies

Contact hours will be awarded per course of the Summer Institute. To earn a certificate, learners must attend all sessions of the course and submit an evaluation form for each course. Nurses will receive 11.25 CEU hours. Sanitarians will receive 11.25 CE hours.

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Module 1

Introductions, QR code for Questions, Ice Breaker

Meagan Gillespie, BS

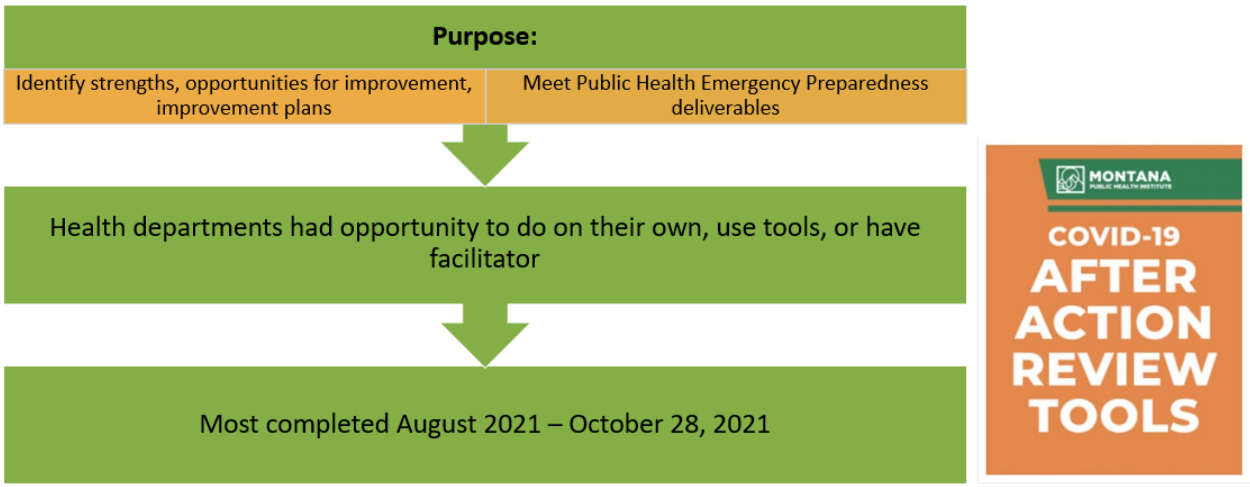
Please use this link if you have questions during any of the presentations
https://form.jotform.com/221575367895168

Please complete your PRE-Test by following this link
https://hipaa.jotform.com/221865234227051

This link is for the CD Epi SECRET SITE
https://dphhs.mt.gov/publichealth/cdepi/CDCPBResources/CDEpi

Themes from Local and Tribal Mid-Pandemic Reviews

Hillary Hanson, MS, MPH



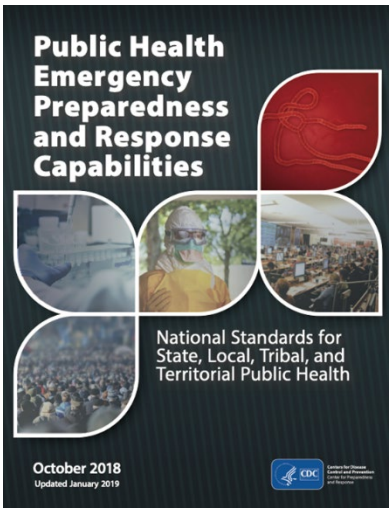
AARs Reviewed (42)

Received MTPHI Facilitation	
Beaverhead	Meagher
Big Horn/Crow	Missoula
Broadwater	Park
Carter	Pondera
Cascade	Powder River
Choteau	Prairie
Central MT Health District	Ravalli
CSKT/Lake	Roosevelt
Custer	Rosebud
Dawson	Sanders
Flathead	Sweet Grass
Hill	Teton
Lewis and Clark	Treasure
Lincoln	Yellowstone

Completed on Own
Blackfeet
Blaine
Carbon
Gallatin
Garfield
Jefferson
Northern Cheyenne
Powell
Rocky Boy
Sheridan
Toole
Wibaux

Methods:

- Facilitation: Two Core Capabilities
    - Emergency Response Coordination
    - Public Information and Warning
    - Local choice (time permitting)
        - Non-Pharmaceutical Interventions
        - Public Health Lab Testing
        - Medical Countermeasure
- On Own:
    - Must address Communications



Emergency Operations Coordination

Strengths:

- Partnerships & relationships were well-established
    - LEPC
    - Regulated businesses
    - Schools
- Participation from healthcare, schools, long-term care, universities, media, and state
- Incident Command System utilized early in the response
- Use of Task Forces/Committees for communication to larger stakeholder groups

Improvement Areas:

- Incident Command
    - Lack of prior training (particularly for public health event)
    - Long-term use was difficult
    - Public Information not well placed in the ICS structure
- Lack of standardization among community organizations
- Lack of relationship with non-regulated businesses
- Staffing of public health roles
    - Remote working
    - Rapid onboarding
- Response structure removed when COVID cases dropped and not re-implemented with rise in cases

Risk Communications

Strengths:

- Robust, multi-faceted strategies
    - Traditional and social media
    - Zoom townhalls
    - Community networks, school apps/systems, emergency alert, reader boards, posters…
- Diverse messengers
- Direct communication with businesses

Improvement Areas:

- Public Information Officer wore multiple hats
- Minimal formal public information training
- Role fell to health departments – minimal use of Joint Information Centers
- Lack of capacity and expertise to provide local data
- Rural challenges: weekly newspaper, lack of internet
- Hard to reach populations missed

- Curbing the volume of information and misinformation
- Changing Directives

Non-Pharmaceutical Interventions

Strengths:

- Early compliance with mandates
- Use of evidence-base & emerging science
- Large event planning and approval processes

Areas of Improvement:

- Lack of enforcement
- Lack of support from community
- Housing for isolation and quarantine
- Legislative changes
- Lack of prior understanding of PH powers and authorities
- Lack of support from elected officials

Medical Countermeasures

Strengths:

- Vaccine distribution, mass clinics a source of pride
- Experience and exercise

Medical Material

Areas of Improvement:

- Limited supplies available early on
- Lack of coordination, confusing direction on acceptable uses

Responder Safety & Health

Areas of Improvement:

- Lack of PPE early on
- First responders not trained in disease control, use of PPE

Surveillance & Epidemiology

Strengths:

- Epidemiologists in large HDs

Areas of Improvement:

- Tough to bring on contact tracers quickly
- No capacity in small HDs to use data

Use of Technology

Strengths:

- New systems to support testing, case inv/contact tracing

Areas of Improvement:

- Adopted too slowly

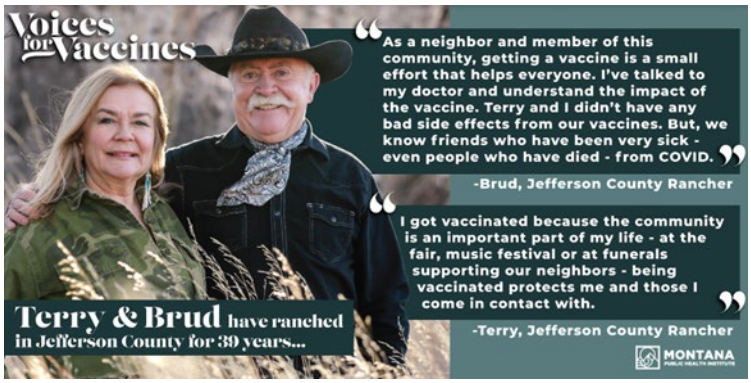
Other Public Health Capacity Issues:

- Difficulties recruiting, hiring, positions added temporarily
- Fatigue, mental health issues, no mechanism for relief
- Lack of appreciation, deterioration of trust

- Resignations

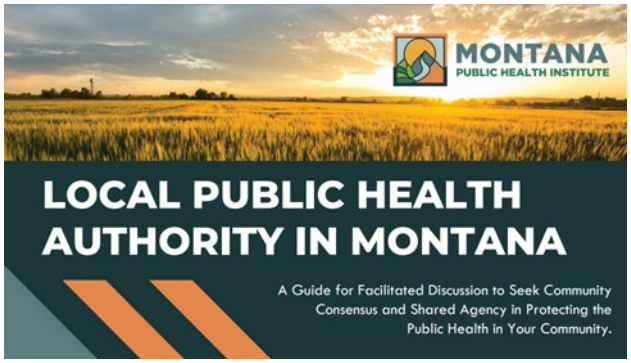
Improvement Planning: Immediate Needs (for 2nd Wave)

- Structures to continue to manage the response
- Bring vaccine clinics and testing sites back up, create additional ones
- Guidance on legislative changes
- Public information support - create unified messaging
- Streamline approval processes for media messages



Improvement Planning: Things in Place

- Communications support
- Wellness Program
- Immunization Toolkit
- Legislative Toolkit



Improvement Planning: Long-Term

- Training – ICS, PIO, risk communication
- Revamp/rescale ICS
- Cross-train in response roles, provide relief for leadership
- Create Joint Information Systems
- Hire PIOs, build risk communications capacity with training, team approach
- With weakened policy tools, create new approaches to messaging about public health events
- Develop systems and policies for remote work and rapid onboarding
- Examine ways to get additional local data support

How Can We Help?

Ideas: Technical Assistance Available

- One-on-one support and guidance
- Discuss plans for revision
- Connected Community
- Link to trainings for staff
    - Help to set up training schedule and new employee orientation

Visit www.ampho.connectedcommunity.org to log in / sign up and be sure to join the PHEP community.

Contact Us!

Hillary.Hanson@mtphi.org
406-249-6357
www.mtphi.org
@mtpublichealthinstitute

Characteristics of COVID Surges in Montana

Sam Saycich, MPH

COVID-19 in Montana

- As of June 3, 2022, there have been 280,012 COVID-19 cases reported to MIDIS
- 12,112 (4%) resulted in a hospitalization
- 3,423 (1%) resulted in death
- 43,598 (16%) children <18 years-old were diagnosed with COVID-19

All Aboard Amtrak Train #CDE092020 with Service to:
Defining COVID-19 Surges in Montana

Defining a Surge of COVID-19

- Surges were defined as prolonged weeks with case incidence rates per 100,000 above 120. This corresponded to >1,300 cases a week.
    - U.S. Census data from 2020 was used for Montana population (1,084,225 persons)
- Using these parameters, Montana has spent 47% of the pandemic in a surge and 87% of our total cases have occurred during a surge.
- This presentation will focus on three key surges that have occurred since the beginning of the pandemic.

Defining a Surge of COVID-19

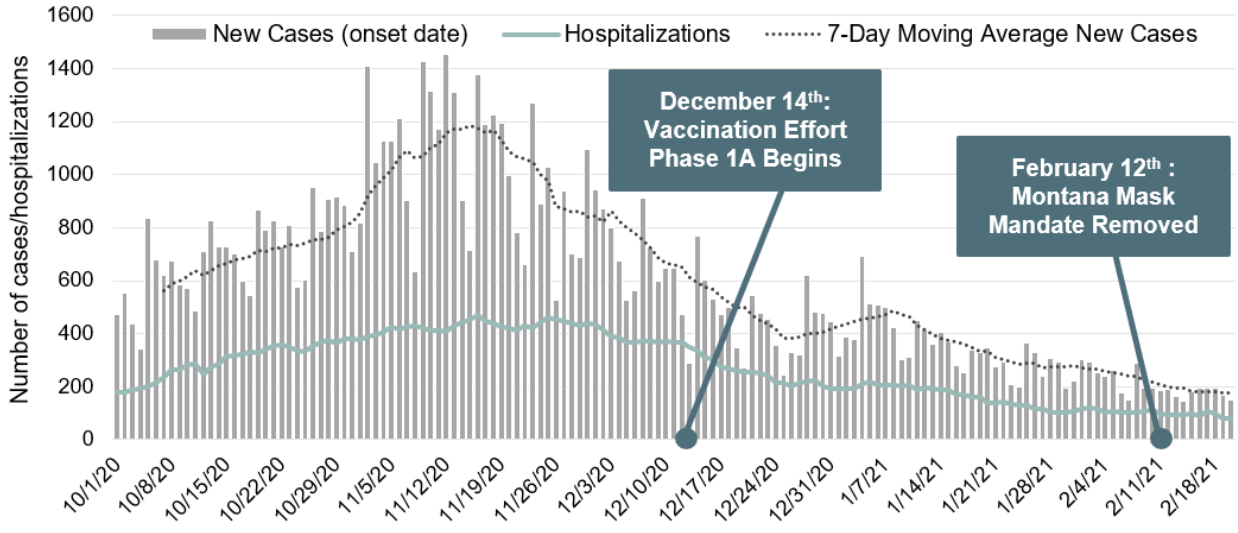
Table 1. COVID-19 Surge Classification and Description, Montana 2022

Surge	Beginning of Surge	End of Surge	Total Number of Weeks
Surge 1 (S1)	**9/13/2020**	**2/20/2021**	**23**
Surge 2 (S2)	**8/1/2021**	**12/11/2021**	**19**
Surge 3 (S3)	**12/26/2021**	**3/5/2022**	**10**

Surge 1 (S1)

- 23 weeks-long
- 89,430 Confirmed and Probable COVID-19 cases during this time period
    - Averages to 3,888 cases a week
- >30% of cases were reported in November of 2020, making it the month with the most reported cases for this surge.

Figure 1. COVID-19 Surge 1 Cases, Hospitalizations, and 7-Day Moving Average, Montana 10/1/2020-2/20/2021



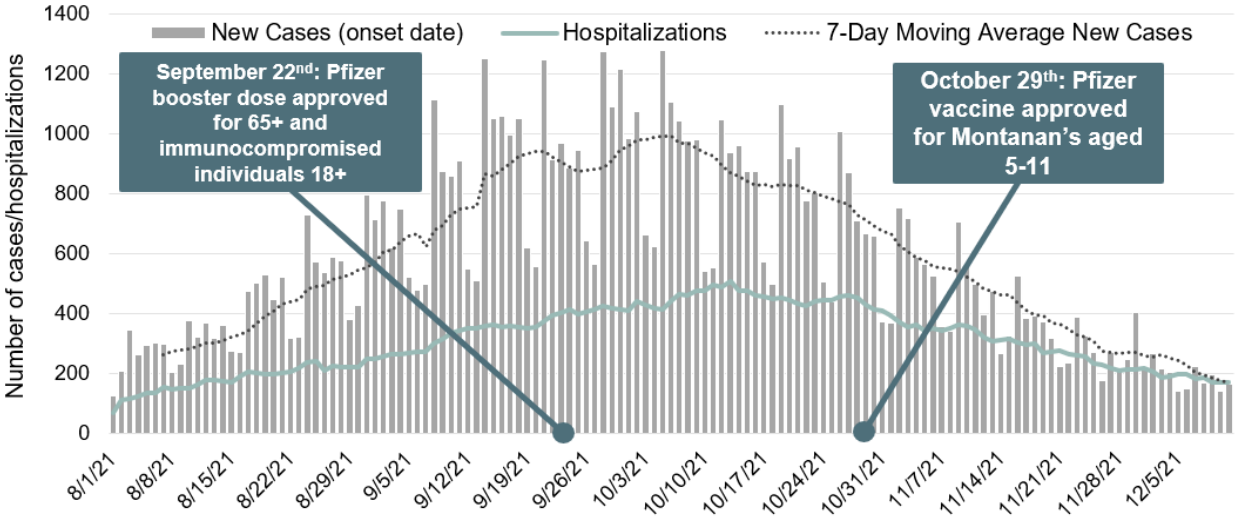
Between Surge 1 and Surge 2

- March 5th, 2021: Montana reaches 100,000 COVID cases
- April 1st, 2021: Vaccination is opened to all Montanans aged 16+
- May 10th, 2021: Vaccination is opened to all Montanans aged 12+

Surge 2 (S2)

- 19 weeks-long
- 77,748 total Confirmed and Probable COVID-19 cases during this time period
    - Averages to 4,092 cases a week
- Also referred to as the Delta surge

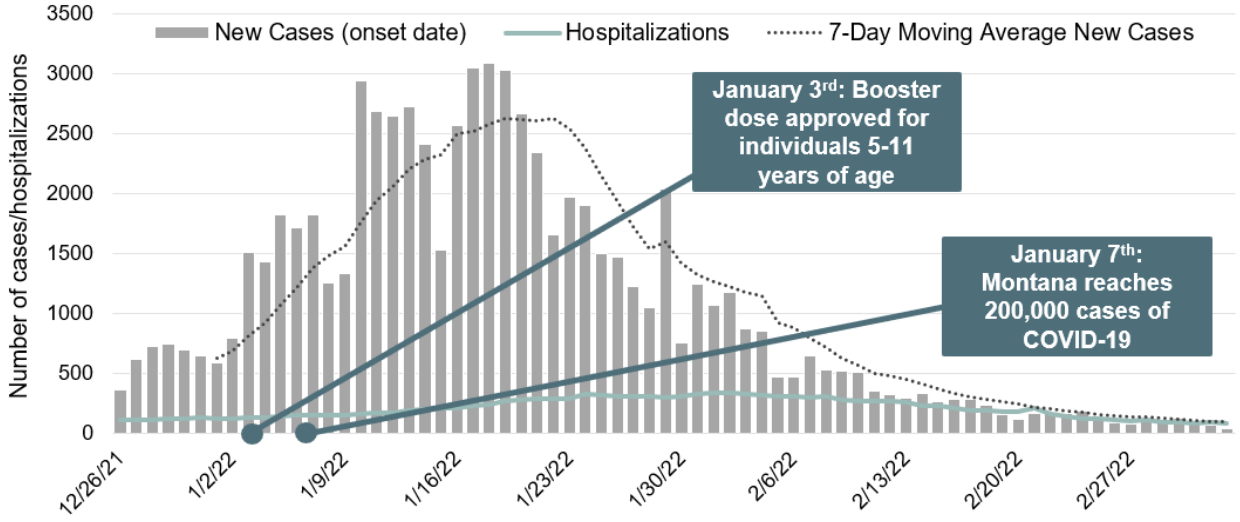
Figure 2. COVID-19 Surge 2 Cases, Hospitalizations, and 7-Day Moving Average, Montana 8/1/2021-12/11/2021



Surge 3 (S3)

- 10 weeks-long
- 75,035 total Confirmed and Probable COVID-19 cases during this time period
    - Averages to 7,504 cases a week
- Also referred to as the Omicron surge

Figure 3. COVID-19 Surge 3 Cases, Hospitalizations, and 7-Day Moving Average, Montana 12/26/2021-3/5/2022



All Aboard Amtrak Train #CDE022021 with Service to:
COVID-19 Surge Characteristics in Montana

Figure 4. Average Weekly COVID-19 Cases During Surges, Montana 2020-2022

Figure 5. Average Weekly COVID-19 Hospitalizations During Surges, Montana 2020-2022

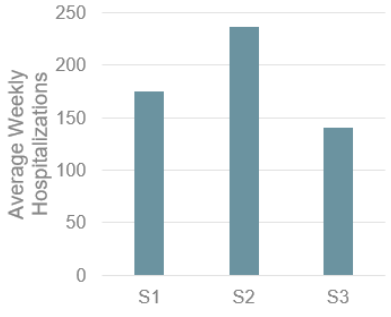


Figure 6. Average Weekly COVID-19 Deaths During Surges, Montana 2020-2022

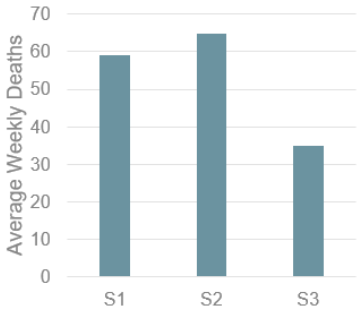


Figure 7. Percentage of Sum of COVID-19 Surge Cases (n=242,213), Hospitalizations (n=9,907), and Deaths (n=2,941) by Age Group, Montana 2020-2022

- Figure 7 summarizes what percentage of the sum of cases, hospitalizations, and deaths throughout the three surges of COVID-19 each age group comprised.

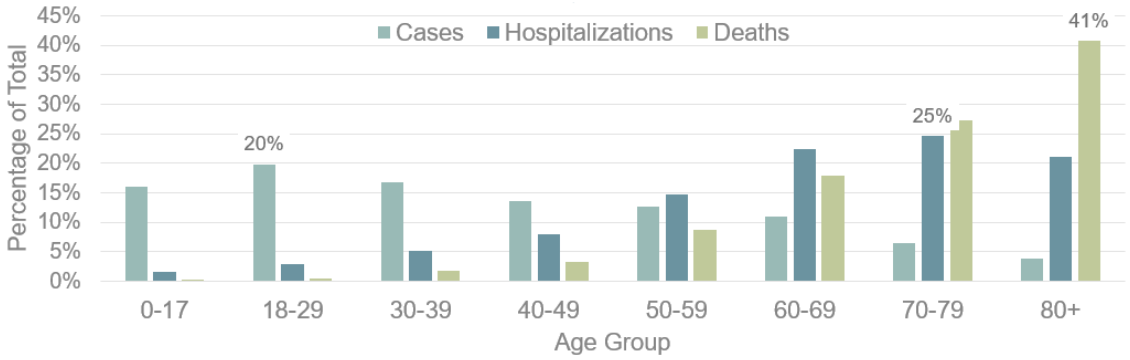


Figure 8. COVID-19 Surge Hospitalization and Death Rates by Age Group, Montana, 2020-2022

- Figure 8 summarizes hospitalization and death rates for the sum of COVID-19 surge cases each age group throughout the three surges.

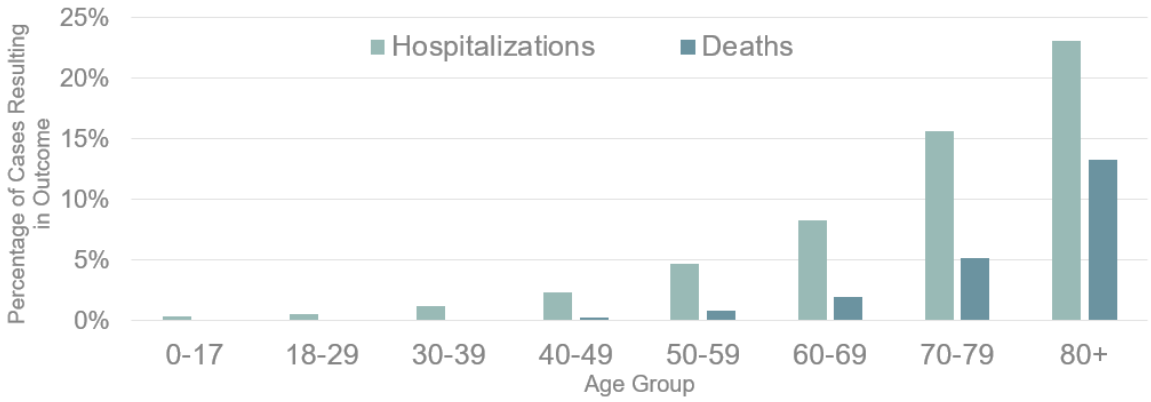
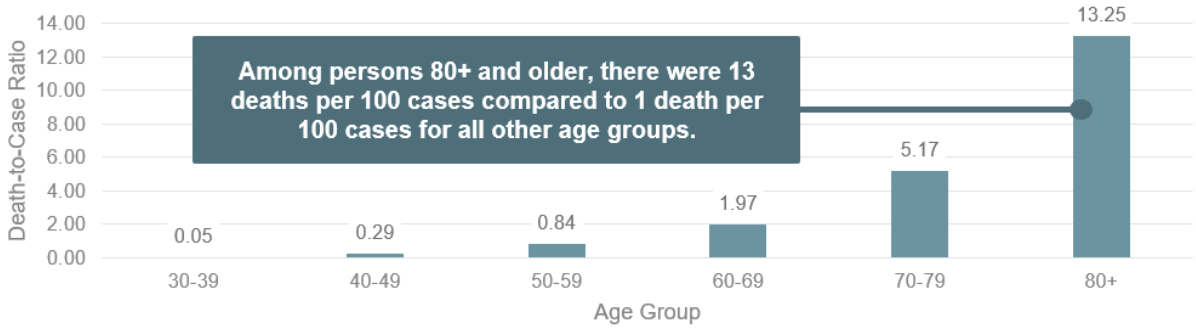


Figure 9. COVID-19 Surge Death-to-Case Ratio by Age Group, Montana 2020-2022

- Figure 9 summarizes the death-to-case ratio observed for each age group. This value is calculated by dividing the sum of deaths among the surges for an age group by the sum of cases among the surges for that age group among the surges and multiplying by 100.

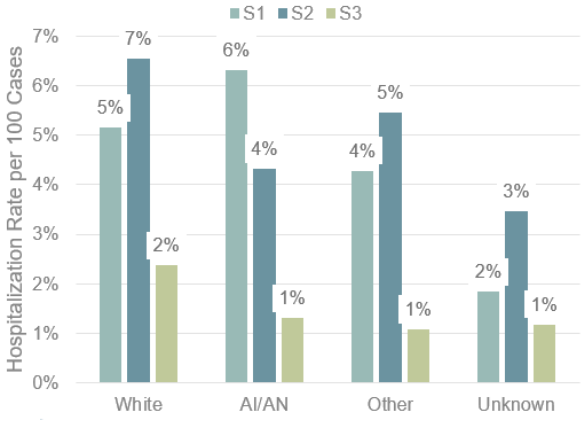


Race Designations Used in Surge Analysis

Table 2. Race Designations Used in Surge Report and Surge Analysis, Montana 2022

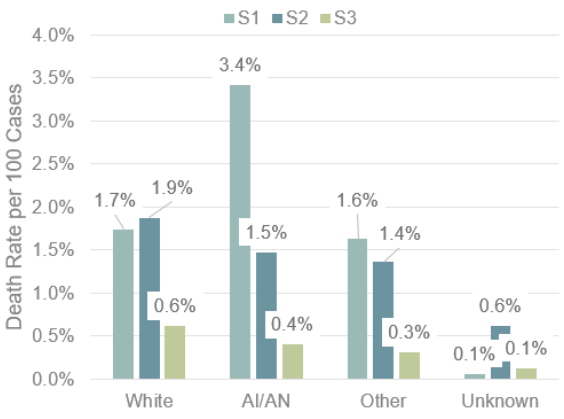
Race Description	Race Designation in Report
White, alone	White
American Indian/Alaskan Native alone or in combination with other races	AI/AN
Other racial descriptions and combinations	Other
Unknown race or missing information	Unknown

Figure 10. COVID-19 Hospitalization Rates Per 100 Cases by Race and Surge, Montana 2020-2022



- Figure 10 summarizes COVID-19 hospitalization rates per 100 cases for major racial groups throughout the three COVID-19 surges in Montana

Figure 11. COVID-19 Death Rates Per 100 Cases by Race and Surge, Montana 2020-2022



- Figure 11 summarizes COVID-19 death rates per 100 cases for major racial groups throughout the three COVID-19 surges in Montana

Notable Hospitalization and Death Trends

- Notable Hospitalization Trends:
  - Significant decrease in hospitalization rates for all racial groups between S1 and S3
  - American Indian/Alaskan Native was the only group that didn't have increased hospitalization rates during S2
- Notable Death Trends:
  - Significant decrease in death rates for American Indian/Alaskan Native population
    - American Indian/Alaskan Native population had some of the highest vaccination rates in Montana (see Table 1).
    - Likely led to better health outcomes after infection and reduced disease severity

Table 3. Vaccination Rates in Counties with Large American Indian/Alaskan Native Populations

County	Percent of Eligible Montanans (5+) Fully Vaccinated
Big Horn	63%
Blaine	56%
Glacier	64%
Hill	62%
Lake	61%
Roosevelt	54%
Rosebud	60%

All Aboard Amtrak Train #CDE082021 with Service to:
Breakthrough COVID-19 Surge Characteristics in Montana

Figure 12. Average Weekly Breakthrough COVID-19 Cases During Surges 2 and 3, Montana 2021-2022

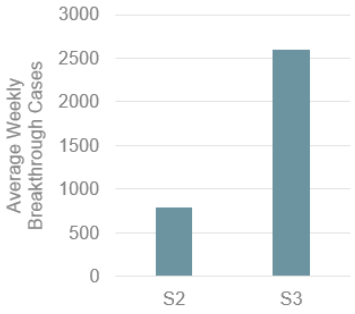


Figure 13. Average Weekly Breakthrough COVID-19 Hospitalizations During Surges 2 and 3, Montana 2021-2022

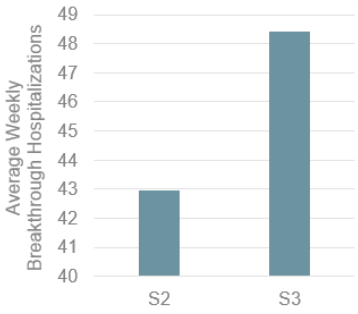


Figure 14. Average Weekly Breakthrough COVID-19 Deaths During Surges 2 and 3, Montana 2021-2022

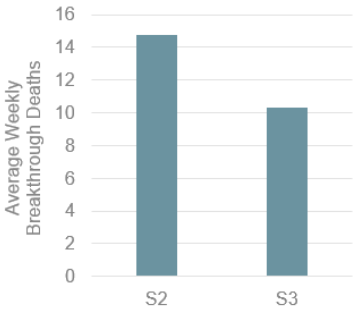


Figure 15. COVID-19 Weekly Breakthrough Cases Compared to Cases in Unvaccinated Individuals, Montana 2021-2022

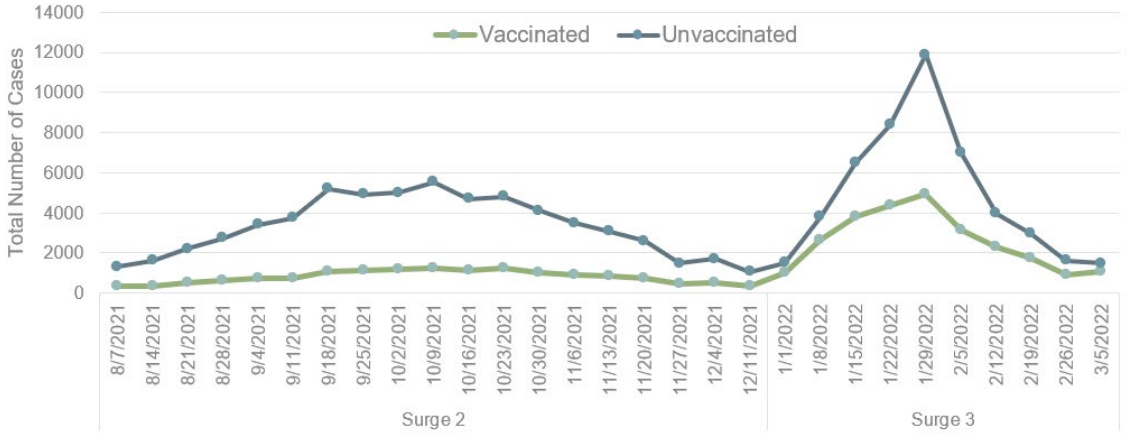


Figure 16. Percentage of Weekly COVID-19 Cases that are Classified as Breakthrough, Montana 2021-2022

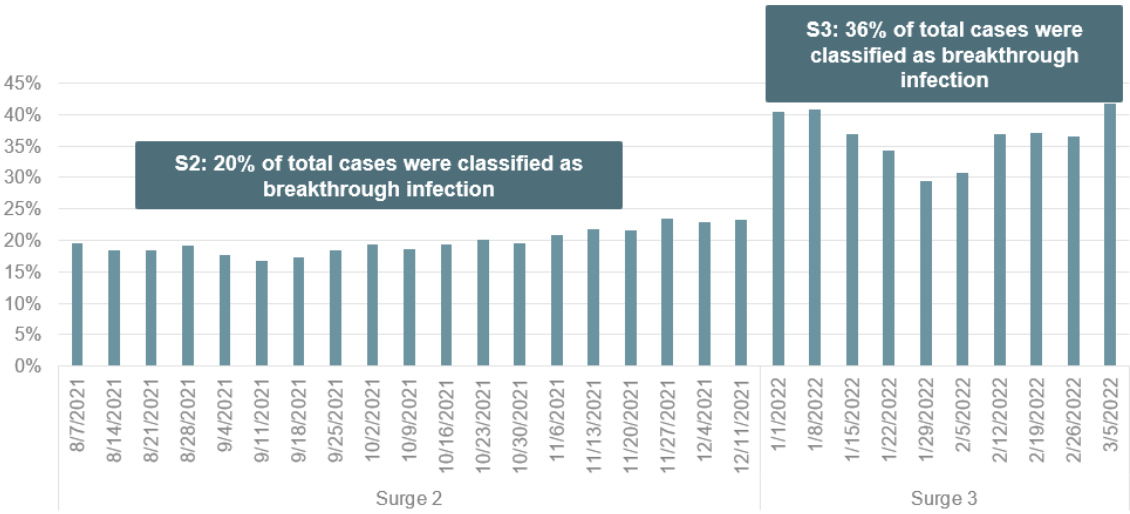


Figure 17. Surges 2 and 3 Breakthrough COVID-19 Cases (n=41,006) by Age Group, Montana 2021-2022

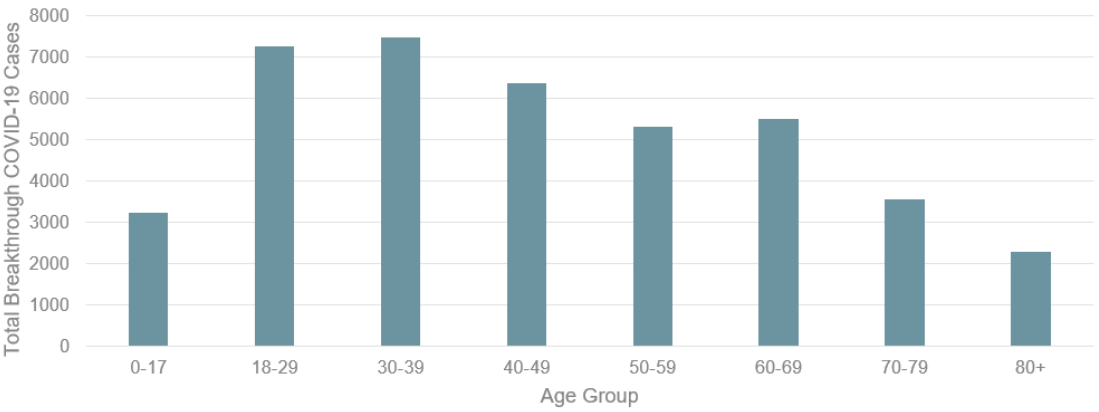


Figure 18. COVID-19 Hospitalization Rates Among Vaccinated and Unvaccinated Individuals during Surges 2 and 3, Montana 2021-2022

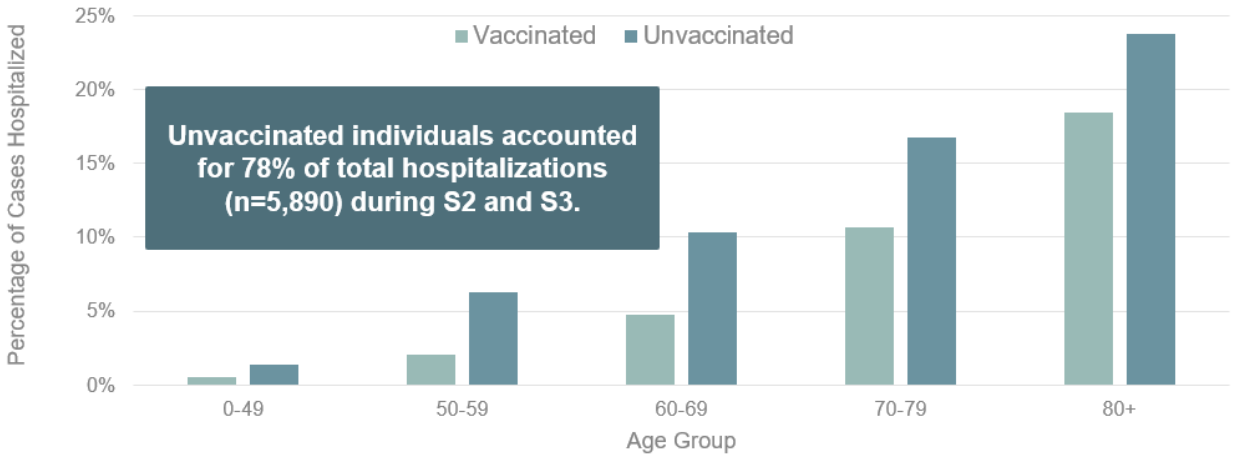
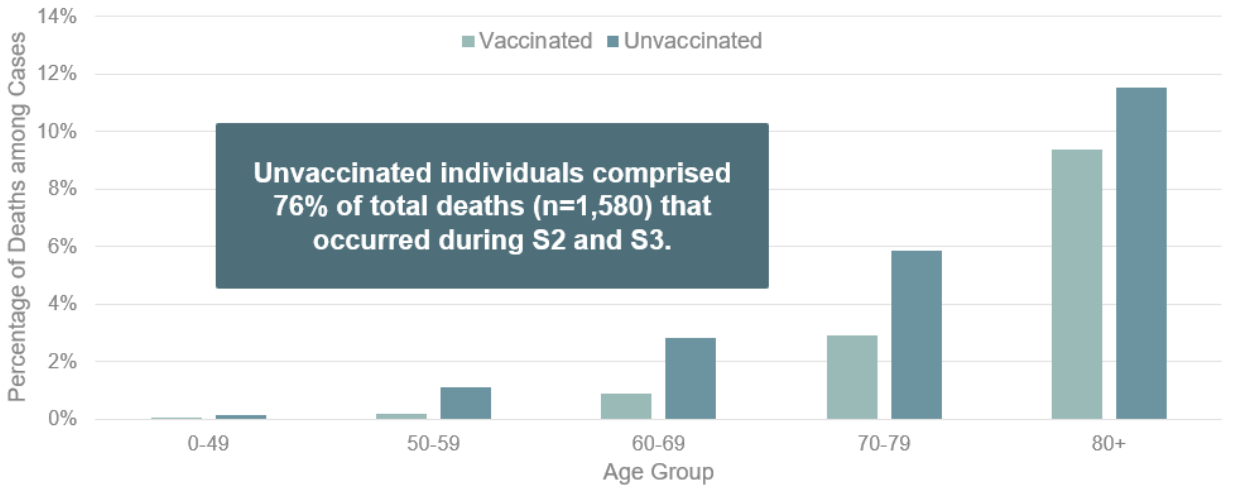


Figure 19. COVID-19 Death Rates Among Vaccinated and Unvaccinated Individuals during Surges 2 and 3, Montana 2021-2022



Summary of Findings

- There was a notable increase in the average number of weekly cases during S3 of the pandemic.
- There was a notable decrease in the average number of weekly deaths during S3 of the pandemic.
- Individuals 18-29 had the highest number of cases among the three surges.
- Individuals 70-79 had the most hospitalizations among the three surges.
- Individuals 80+ had the most deaths among the three surges.
- Individuals 80+ comprised 4% of Montana's total cases but accounted for over 40% of Montana's total deaths.
- There was a notable decrease in AI/AN hospitalizations and deaths in S2 and S3, likely due to continued vaccination efforts.
- The proportion of breakthrough cases increased in S3, which may indicate waning immunity or evading immunity in the community.

- Breakthrough hospitalizations increased in S3, which might be due to waning immunity or evading immunity, but it could also be related to individuals that are immunocompromised who were recommended to receive additional doses/booster doses but did not.

Some Considerations

- Breakthrough classification does not account for booster doses or additional doses
    - It's possible that there are individuals that did not get recommended booster doses that were more susceptible to breakthrough infection
- 78% of our breakthrough infection occurred in individuals aged 18-69, likely due to resuming "pre-COVID" social habits following vaccination

Where is Montana Now?

- Using surge parameters of weekly case incidence rate of 120 cases per 100,000 (>1,300 cases a week), Montana is currently in its 4th surge.
- 4th surge began the week of May 22,2022. We are currently in its 9th week of response.
- As of 7/12/22, Montana appears to be in another Omicron surge with different subvariants (BA 2.12.1, BA.4, and BA.5) becoming more dominant.

Sam Saycich, MPH
COVID-19 and Zoonotics Epidemiologist
Samantha.Saycich@mt.gov 406-444-0018

Basic Epidemiology Concepts – The Big Problem of Small Numbers

Jennifer Rico, MA

Context: What's the BIG Problem?

Montana is one of the least populated states in the country but the 4th largest in terms of land size.

- Yellowstone County is the most populous
- Petroleum County is the least populous

In Summary:

Montana is a large state with a small population…which complicates data reporting in a big way!

What is our responsibility?

- We are charged with protecting the public's health,
- While protecting the privacy and confidentiality of affected individuals,
- And ensuring that we report statistically accurate data.

Data Reporting Balancing Act

Data Reporting Balancing Act

Context about today's presentation:

- Summary statistics or data presentations
- Meant for public reporting
- Lacks nuance for communicable disease
- Non-survey data
- Not imposing any requirements

Numerator

the number of events that occurred within the population of interest.

Denominator

the total number of individuals within the population of interest.

Year	Number of Deaths	Estimated Annual Population
2020	12,030	1,080,577
2019	10,403	1,070,123
2018	9,991	1,061,818

What are the numerators and denominators in your day-to-day work?

- Residents in the county
    - Numerator= number of affected residents
    - Denominator= the number of total residents
- Residents of a facility
    - Numerator= number of affected facility residents
    - Denominator= ?

Confidentiality and Privacy

State and Federal Privacy Laws

- Montana
    - M.T. Const. art. II, § 10.
    - MCA § 50-15-122
    - MCA § 50-16-603
- Federal
    - 45 C.F.R. § 164.502.
    - 45 C.F.R. § 164.512.
    - 45 C.F.R. § 164.514.
    - 45 C.F.R. § 164.502(b).
    - 45 C.F.R. § 164.513(b).
    - 45 C.F.R. § 164.514(d).

Disclosure Avoidance

> *"Minimizing the risk of disclosure (public identification) of the identity of individual reporting units and information about them."*
> *~Statistical Policy Working Paper 22*

Types of Disclosure

1. Identity Disclosure - Identity disclosure occurs when an individual can be identified by information that is publicly released.
2. Attribute Disclosure - Attribute disclosure occurs when a characteristic about a person is released.
3. Inferential Disclosure - Inferential disclosure is more subtle, and ultimately of less concern, than either identity or attribute disclosure.
4. Community Disclosure - associated with groups of people rather than individuals and in reference to the reporting of information about a particular community.

Privacy Risk in Data Reporting

- Small Numbers
    - As the number reported (n) decreases, the risk of attribute and inferential disclosure increases.
- Small Area/Community
    - Smaller numerators and lower denominators = increase the risk of identity and inferential disclosure.
    - Small areas are also likely to contain small communities = community disclosure risks.

Common Numerator and Denominator Thresholds

Frequency Counts

- CDC WONDER: < 10 events/cases

- CDC National Center for Health Statistics: <5
- DPHHS, Public Health and Safety Division:
    - If denominator >300 then suppress counts <5.
    - If denominator of cell < 300: If number of events in cell < 20, do not compute rates; suppress count(s) or aggregate strata or years.

**events/counts of zero should be reported.*

Statistical Reliability

Assessing Statistical Reliability of Small Numbers

Confidence Intervals:

- Display the probability that a rate or other metric will fall between a pair of values.
- Measure the degree of certainty in the calculation of a rate or other metric.
- Smaller numbers produce larger confidence intervals with less precision.

Relative Standard Error (RSE):

- Measures the relative error, or reliability, in relation to the size of an estimated value.
- The larger the RSE, the more unreliable the estimate.
- Smaller populations → larger RSE.

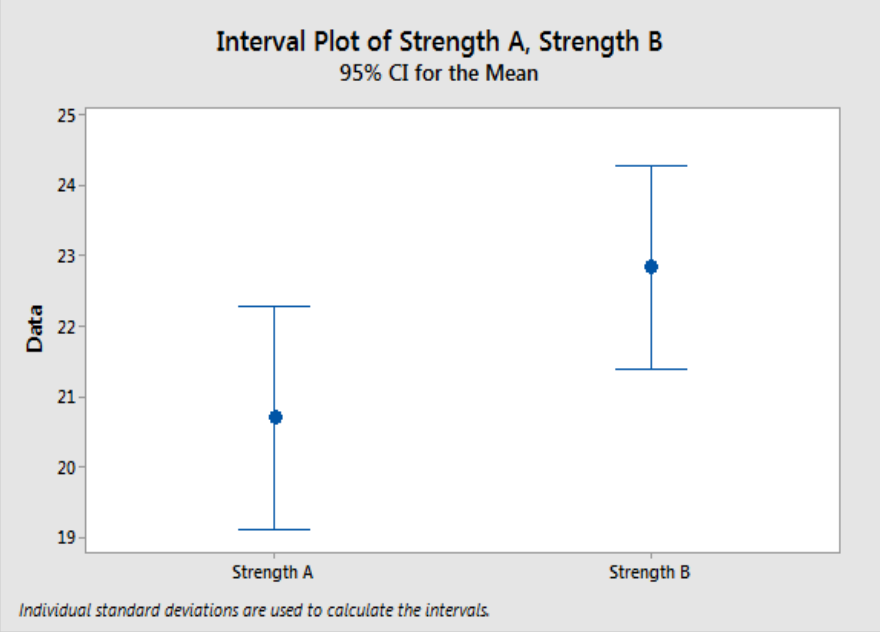
Assessing Statistical Reliability

Confidence Intervals (CI):

- CI with a width less than +/- 10% of the point estimate would be considered very precise and a CI
- +/- 20% is adequately precise for some purposes.
- 95% confidence intervals are calculated.

Relative Standard Error (RSE):

- RSE > .50: extremely large sampling error.
- .30 ≤ RSE ≤ .50: precision is questionable.
- RSE < .30: Estimate can be deemed as precise.



Confidence Intervals and Statistical Significance

- Do overlapping CI's mean the difference is not statistically significant?

Check the p-value!

- If the p-value < 0.05 (assuming a 95% confidence interval) the difference is statistically significant.

What happens when we analyze data from small populations?

1. Increase the likelihood that a reported individual can be identified.
2. Produces highly unstable rates or estimates.

Number of X Events, Petroleum County, MT, 2018-2020		
Year	**Number of Events**	**Annual Female Population**
2019	2	100
2018	10	105
2017	8	102

Practical Strategies

Strategies to Address Small Numbers:

Aggregation

- Combine Across Data Years

Year	# of Cases
2020	4
2019	13
2018	2
2017	4
2016	3

→

Years	# of Cases
2016-2020	26

Reduce Dimensionality

- Simplify tables

Age Range	White	American Indian
All Ages	25	25
0-4 years	3	4
5-9 years	10	15
10-14 years	12	6

→

Age Range	Total Cases
All Ages	50
0-4 years	7
5-9 years	25
10-14 years	18

Suppression

- Using a symbol to mask a small number/sensitive cell.
- Complementary suppression

Age Range	White	American Indian
All Ages	25	25
0-4 years	<5	<5
5-9 years	*	15
10-14 years	12	*

Considerations for Reporting Small Numbers

1. Purpose of data reporting
2. Laws or guidelines about reporting data
3. Sensitivity of the affected population
4. Knowledge of the community
5. Risk versus benefit

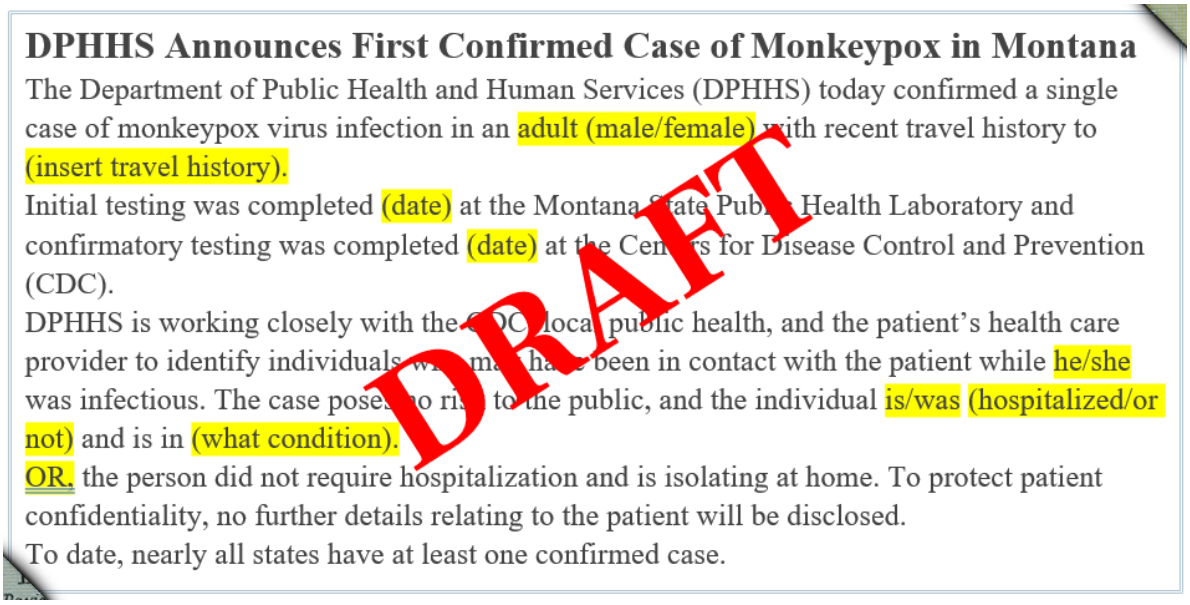
Scenario #1

In 2019, a newspaper in a small jurisdiction reported that new HIV diagnoses among people who inject drugs had doubled. In looking at the data, the number of cases had increased from 1 case in 2018 to 2 cases in 2019. After the news report, a few community members had posted on social media that they knew who was diagnosed with HIV because they knew who uses drugs.

Scenario #2

DPHHS recommended that a facility place a temporary hold on visitation during an active COVID-19 outbreak due to significant spread and over 50% of the residents testing positive. A family member of a facility resident did not understand why visitation was paused and requested the number of individuals who were hospitalized and died due to this outbreak.

Template Press Release



DPHHS Announces First Confirmed Case of Monkeypox in Montana

The Department of Public Health and Human Services (DPHHS) today confirmed a single case of monkeypox virus infection in an adult (male/female) with recent travel history to (insert travel history).

Initial testing was completed (date) at the Montana State Public Health Laboratory and confirmatory testing was completed (date) at the Centers for Disease Control and Prevention (CDC).

DPHHS is working closely with the CDC, local public health, and the patient's health care provider to identify individuals who may have been in contact with the patient while he/she was infectious. The case poses no risk to the public, and the individual is/was (hospitalized/or not) and is in (what condition).

OR, the person did not require hospitalization and is isolating at home. To protect patient confidentiality, no further details relating to the patient will be disclosed.

To date, nearly all states have at least one confirmed case.

Considerations for Press Releases

- What information is critical for the public to know?
- "One size fits all" template press release is not advisable
- Could the information compromise the identity of the individual?
- Minimize messaging that could stigmatize the community
- Coordination between LHJ's and DPHHS

Additional Resources

Montana DPHHS

Guidelines for the Release of Public Health Data Derived from Personal Health Information
https://dphhs.mt.gov/assets/publichealth/Epidemiology/GuidelinesReportingPHI.pdf

Washington Department of Health

Standards for Reporting Data with Small Numbers
https://doh.wa.gov/sites/default/files/legacy/Documents/1500//SmallNumbers.pdf

Statistical Policy Working Paper 22

Report on Statistical Disclosure Limitation Methodology
https://www.hhs.gov/sites/default/files/spwp22.pdf

THANKS!

Any questions?
Email: jennifer.rico@mt.gov
Phone: 406-444-6947

Press Release Template For Reference ONLY

DPHHS Announces First Confirmed Case of Monkeypox in Montana

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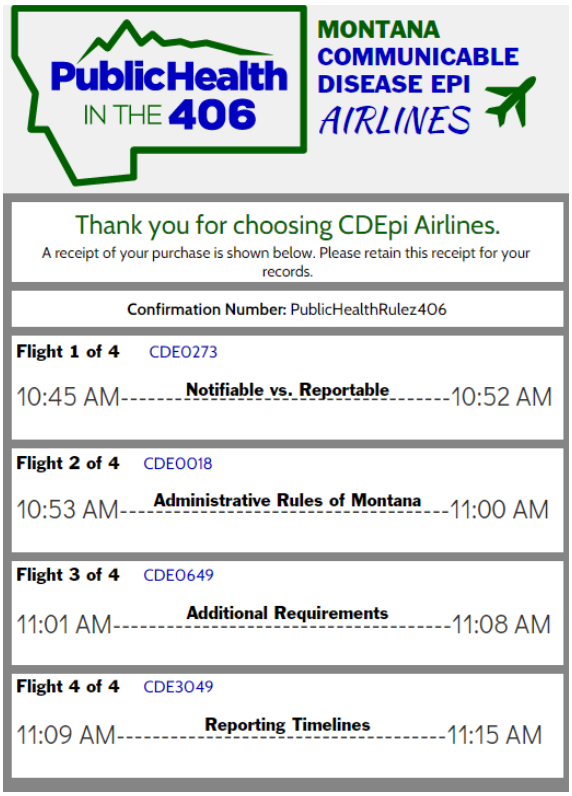
Public Health Reporting

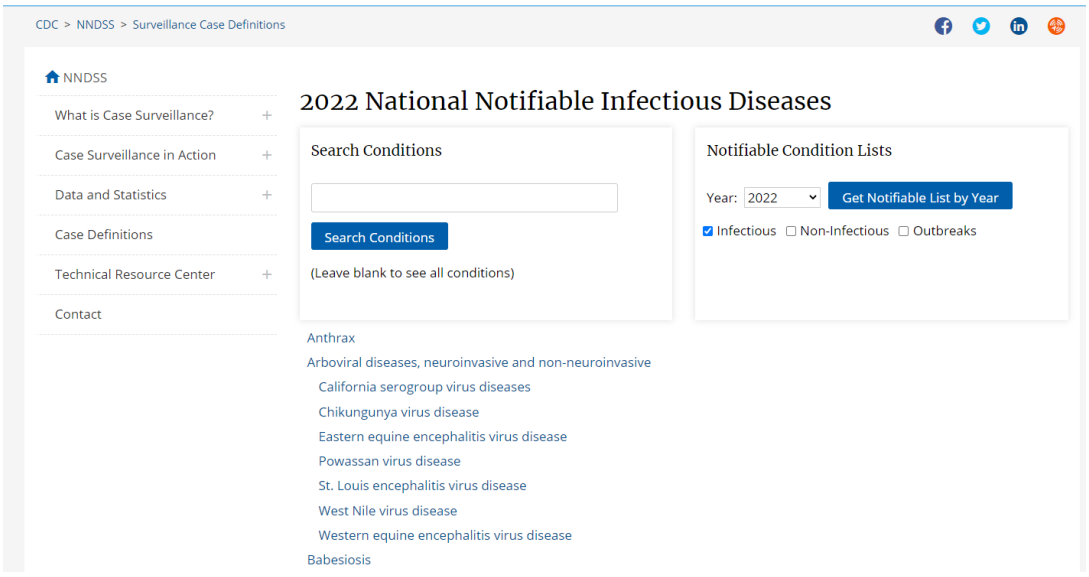
Sam Saycich, MPH



Now Boarding Flight CDE0273 with Service to:
Notifiable vs. Reportable Diseases and Conditions

- The Council of State and Territorial Epidemiologists and CDC identify the list of notifiable diseases and conditions.
- States voluntarily inform CDC when a person meets certain criteria to become a case.
- Case Records do not contain personally identifiable information.
- CDC uses the data to monitor, measure, and alert individual communities or the nation to outbreaks and other public health threats.
- The list of about 120 diseases and conditions is updated annually.

Notifiable Diseases and Conditions
https://ndc.services.cdc.gov/search-results-year/



Notifiable Diseases and Conditions- Case Definitions

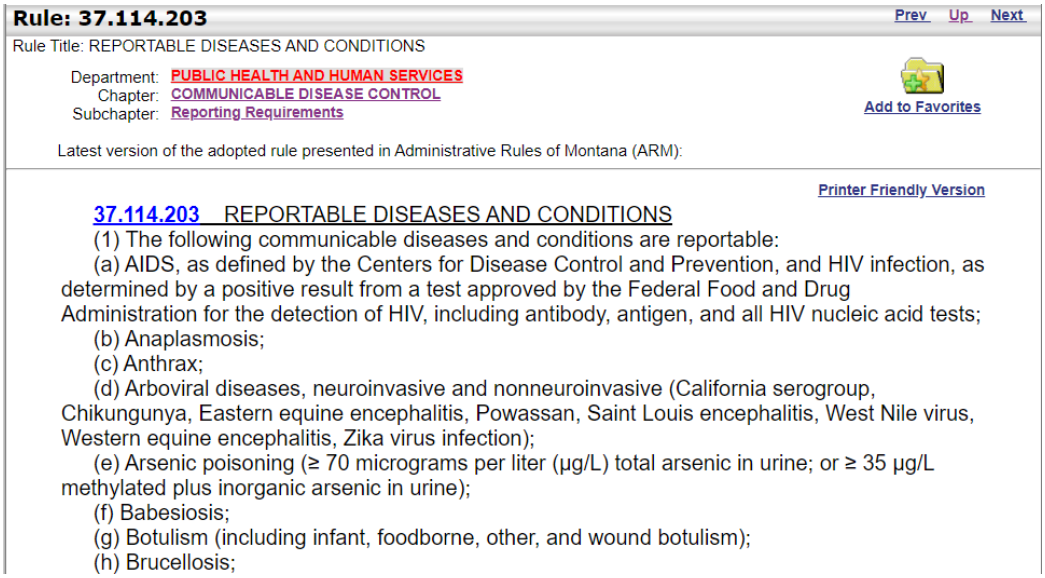
https://www.cdc.gov/nndss/index.html

Reportable Diseases and Conditions

- Each state or territory sets local laws and rules for which diseases and conditions must be reported (Montana builds our list off the national notifiable diseases and conditions list).
- Healthcare professionals, laboratories, hospitals, and other providers must tell public health departments when a person is diagnosed.
- Public health departments collect information about the person and how they became ill.
- This information is used to locate the source of an outbreak and prevent the spread.
- The list of diseases and conditions can change every year.

Reportable Diseases and Conditions

https://rules.mt.gov/gateway/ruleno.asp?RN=37%2E114%2E203



Rule: 37.114.203 Prev Up Next

Rule Title: REPORTABLE DISEASES AND CONDITIONS

Department: PUBLIC HEALTH AND HUMAN SERVICES
Chapter: COMMUNICABLE DISEASE CONTROL
Subchapter: Reporting Requirements

Add to Favorites

Latest version of the adopted rule presented in Administrative Rules of Montana (ARM):

Printer Friendly Version

37.114.203 REPORTABLE DISEASES AND CONDITIONS

(1) The following communicable diseases and conditions are reportable:

(a) AIDS, as defined by the Centers for Disease Control and Prevention, and HIV infection, as determined by a positive result from a test approved by the Federal Food and Drug Administration for the detection of HIV, including antibody, antigen, and all HIV nucleic acid tests;

(b) Anaplasmosis;

(c) Anthrax;

(d) Arboviral diseases, neuroinvasive and nonneuroinvasive (California serogroup, Chikungunya, Eastern equine encephalitis, Powassan, Saint Louis encephalitis, West Nile virus, Western equine encephalitis, Zika virus infection);

(e) Arsenic poisoning (≥ 70 micrograms per liter (µg/L) total arsenic in urine; or ≥ 35 µg/L methylated plus inorganic arsenic in urine);

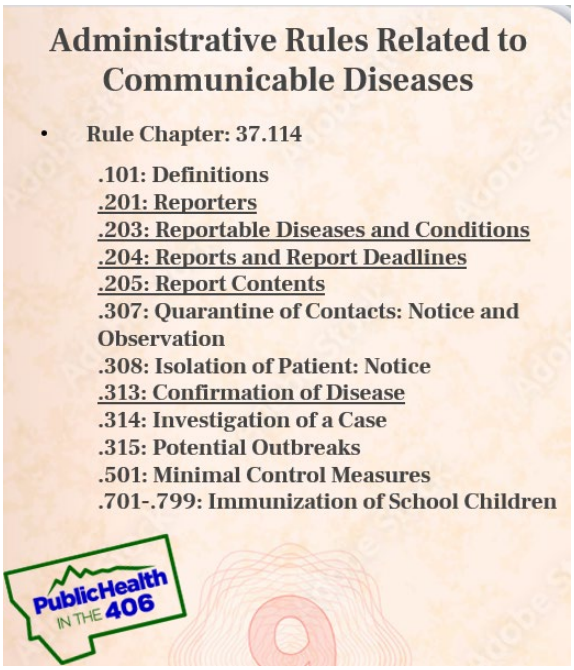
(f) Babesiosis;

(g) Botulism (including infant, foodborne, other, and wound botulism);

(h) Brucellosis;

Now Boarding Flight CDE0018 with Service to: Administrative Rules of Montana (ARMs)
Administrative Rules of Montana

- Agency regulations, standards, or statements of applicability that implement, interpret, or set law or policy.
- Agencies can adopt administrative rules that describe the organization, procedures, or practice
- requirements of the agency.
- Agencies are given rulemaking authority through the legislative process.
- Have the force and effect of law.



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(c) Anthrax;
(d) Arboviral diseases, neuroinvasive and nonneuroinvasive (California serogroup, Chikungunya, Eastern equine encephalitis, Powassan, Saint Louis encephalitis, West Nile virus, Western equine encephalitis, Zika virus infection);
(e) Arsenic poisoning (≥ 70 micrograms per liter (µg/L) total arsenic in urine; or ≥ 35 µg/L methylated plus inorganic arsenic in urine);
(f) Babesiosis;
(g) Botulism (including infant, foodborne, other, and wound botulism);
(h) Brucellosis;
(i) Cadmium poisoning (≥ five µg/L total blood cadmium levels; or ≥ three µg/L total cadmium in urine);
(j) Candida auris (C. auris);
(k) Campylobacteriosis;
(l) Chancroid;
(m) Chlamydia trachomatis infection;
(n) Cholera;
(o) Coccidioidomycosis;
(p) Colorado tick fever;
(q) Cryptosporidiosis;
(r) Cyclosporiasis;
(s) Dengue virus infections;
(t) Diphtheria;
(u) Ehrlichiosis;
(v) Escherichia coli, Shiga toxin-producing (STEC);
(w) Gastroenteritis outbreak;
(x) Giardiasis;
(y) Gonorrheal infection;
(z) Granuloma inguinale;
(aa) Haemophilus influenzae invasive disease;
(ab) Hansen's disease (leprosy);
(ac) Hantavirus pulmonary syndrome or infection;

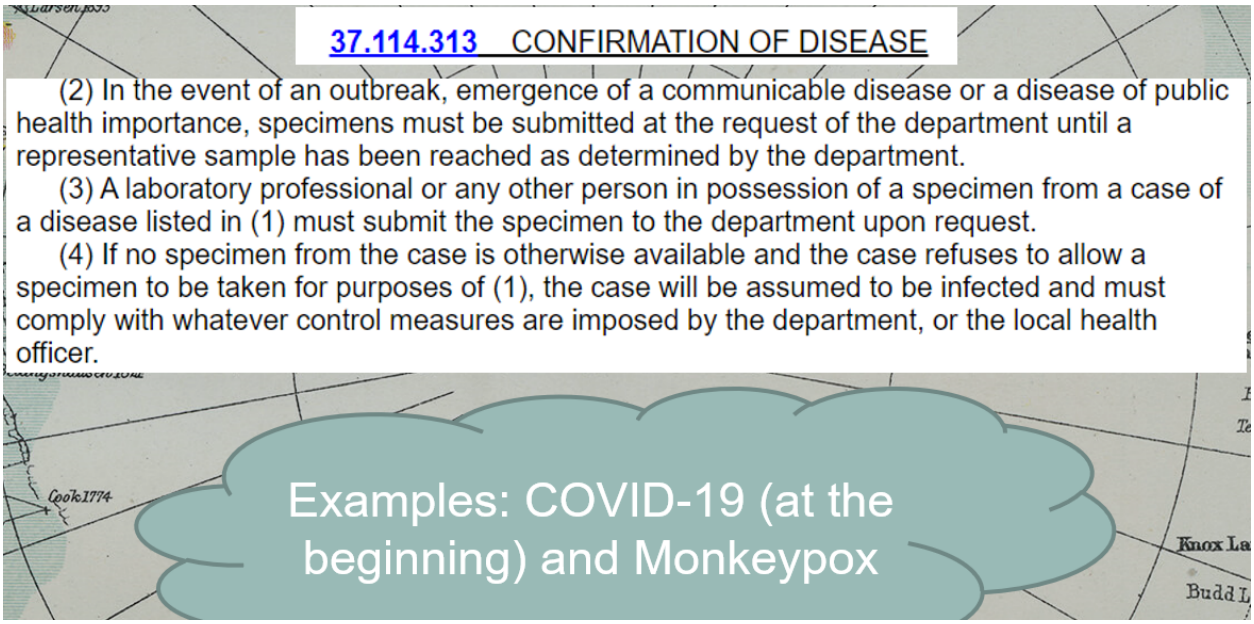
There are **71** Reportable Diseases and Conditions in ARM 37.114.203

37.114.205 REPORT CONTENTS
(1) A report of a case of reportable disease or a condition which is required by ARM 37.114.204(1) or (2) must include, if available:
(a) first and last name and middle initial, physical address including city, state and zip code, date of birth, gender, race, and ethnicity of the case;
(b) dates of onset of the disease or condition and the date the disease or condition was reported to the health officer;
(c) whether or not the case is suspected or confirmed;
(d) name and address of the case's physician; and
(e) name of the reporter or other person the department can contact for further information regarding the case.
(2) The information required by (1) must be supplemented by any other information in the possession of the reporter which the department or local health officer requests and which is related to case management and/or investigation of the case.
(3) The name or other identifying information of any case with a reportable disease or condition and the name and address of the reporter of any such case are confidential and not open to public inspection.

37.114.313 CONFIRMATION OF DISEASE

(1) Subject to the limitation in (2), if a local health officer receives information about a case of any of the following diseases, the officer must work with the department to ensure that a specimen from the case is submitted to the department, when possible, which will be analyzed to confirm the existence or absence of the disease in question, or for further examination associated with surveillance or investigation of disease transmission:

(a) Anthrax;
(b) Arboviral diseases, neuroinvasive and non-neuroinvasive (California serogroup, Chikungunya, Eastern equine encephalitis, Powassan, Saint Louis encephalitis, West Nile virus, Western equine encephalitis, Zika virus infection);
(c) Botulism;
(d) Brucellosis;
(e) Candida auris (C. auris);
(f) Carbapenem-Resistant Organisms;
(g) Cholera;
(h) Diphtheria;
(i) Escherichia coli, Shiga toxin-producing (STEC);
(j) Haemophilus influenzae invasive disease;
(k) Hantavirus pulmonary syndrome or infection;
(l) Influenza;
(m) Listeriosis;
(n) Measles (rubeola);
(o) Meningococcal disease (Neisseria meningitidis);
(p) Plague;
(q) Poliomyelitis, paralytic or non-paralytic;
(r) Rabies (human);
(s) Rubella (including congenital);
(t) Salmonellosis (including Salmonella Typhi and Paratyphi);
(u) Severe acute respiratory syndrome-associated coronavirus (SARS-CoV) disease;
(v) Shigellosis;
(w) Smallpox;
(x) Trichinellosis (Trichinosis);
(y) Tuberculosis disease;
(z) Tularemia;
(aa) Vancomycin-intermediate staphylococcus aureus (VISA);
(ab) Vancomycin-resistant staphylococcus aureus (VRSA); and
(ac) Vibriosis.



Now Boarding Flight CDE0649 with Service to:
Additional Reporting Requirements
COVID-19 Laboratory Reporting Requirements
As of March 8, 2022:

- Public Law 116-136, § 18115(a), the Coronavirus Aid, Relief, and Economic Security (CARES) Act
- Requires "Every laboratory that performs or analyzes a test that is intended to detect SARS-CoV- 2 or to diagnose a possible case of COVID-19" to report the results from each such test to the Secretary of the Department of Health and Human Services (HHS).

Reporting Options

- Submission directly to state, territorial, local, and tribal (STLT) health departments
- Submission to STLT health agency via a centralized platform
- Submission through state or regional health information exchange
- Submission through the National Healthcare Safety Network (long-term care facilities only)

Table 1. Reporting Requirements by Entity and Type of Testing

	Is Reporting Required Under this Guidance?		Examples
	Positive Results	Negative & Inconclusive Results	
NAAT-testing conducted in a facility certified under CLIA to perform moderate- or high-complexity tests	**Required**	**Required**	• Laboratory-based Nucleic Acid Amplification Test (NAAT) testing, including RT-PCR, TMA, LAMP, and SDA tests • See https://www.cdc.gov/coronavirus/2019-ncov/lab/naats.html for more information
All other testing (except antibody)	**Required**	**Optional***	• Testing conducted in a setting operating under a CLIA certificate of waiver such as rapid tests used in many settings (e.g., screening testing at schools, correctional facilities, employee testing programs, long-term care facilities, and point-of-care testing performed in pharmacies, medical provider offices, and drive-through and pop-up testing sites) • Non-NAAT (e.g., high throughput antigen) testing conducted in a facility certified under CLIA to perform moderate or high-complexity tests
Antibody testing	**Optional***	**Optional***	• Tests used to determine previous infection with SARS-CoV-2 in any setting

* State, local, territorial, and Tribal jurisdictions may have additional laboratory reporting requirements applicable to testing entities subject to their jurisdiction. Refer to the applicable jurisdiction's reporting requirements.

Minimum Required Data Elements

- Patient name (last name, first name, middle initial)
- Patient street address
- Patient phone number with area code
- Patient date of birth
- Patient age
- Patient race
- Patient ethnicity
- Patient sex
- Patient residence zip code
- Patient residence county
- Test ordered AND test resulted – use appropriate LOINC codes
- Device identifier
- Test result (values) – use appropriate SNOMED-CT codes
- Test result date (date format)
- Date specimen collection (date format)
- Accession #/Specimen ID
- Ordering organization or ordering provider name and NPI (as applicable), address, phone number, zip code along with affiliated organization (specific facility)
- Performing facility name and CLIA number, address, phone number, code
- Specimen source – use appropriate SNOMED-CT, LOINC, or SPM4 codes, or equivalently detailed alternative codes
- Reporting entity name and CLIA number (or appropriate ID), and address

COVID-19 Laboratory Reporting Requirements

- Self-administered tests are **outside** the reporting requirements for laboratories in Section 18115 of the CARES Act
- However, these tests are of enormous potential public health and clinical value and utility, so MTDPHHS has a portal for patients to report their self-administered test results.
- MIDIS turns these into probable or suspect cases (depending on community transmission).

Now Boarding Flight CDE3049 with Service to:

Reporting Timelines

37.114.201 REPORTERS

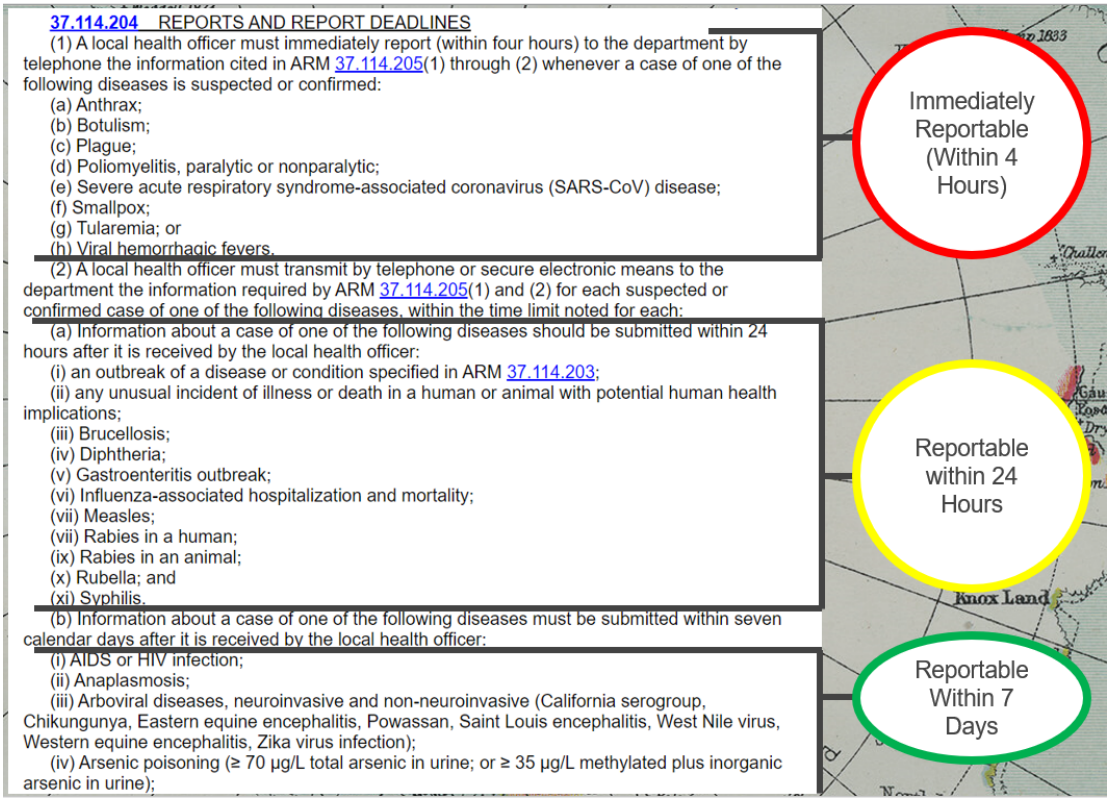
(1) With the exceptions noted in (3), (4), and (5), any person, including a physician, dentist, nurse, medical examiner, other health care practitioner, administrator of a health care facility or laboratory, public or private school administrator, or laboratory professional who knows or has reason to believe that a case exists of a reportable disease or condition defined in ARM 37.114.203 must immediately report to the local health officer the information specified in ARM 37.114.205(1) and (2).

(2) A local health officer must submit to the department, on the schedule noted in ARM 37.114.204, the information specified in ARM 37.114.205 concerning each confirmed or suspected case of which the officer is informed.

(3) A state-funded anonymous testing site for HIV infection is not subject to the reporting requirement in (1) with regard to HIV testing.

(4) With the exception of a licensed healthcare provider, reporters under (1) may report directly to the department at the department's request with approval of the local health authority.

(5) With the exception of diseases listed in ARM 37.114.204(1) and (2)(a), laboratories, with the consent of the local health officer, may utilize electronic laboratory reporting (ELR) to satisfy (1).



IMMEDIATELY REPORTABLE

- Anthrax
- Botulism
- Plague
- Poliomyelitis
- SARS-CoV*
- Smallpox
- Tularemia
- Viral hemorrhagic fevers
  **not SARS-CoV-2/COVID-19*

REPORTABLE WITHIN 24-HOURS

- An outbreak of a disease or condition specified in ARM 37.114.203
- Brucellosis
- Diphtheria
- Gastroenteritis Outbreak
- Influenza-associated hospitalization and mortality
- Measles
- Rabies (in a human and/or in an animal)
- Rubella
- Syphilis

REPORTABLE WITHIN 7 DAYS

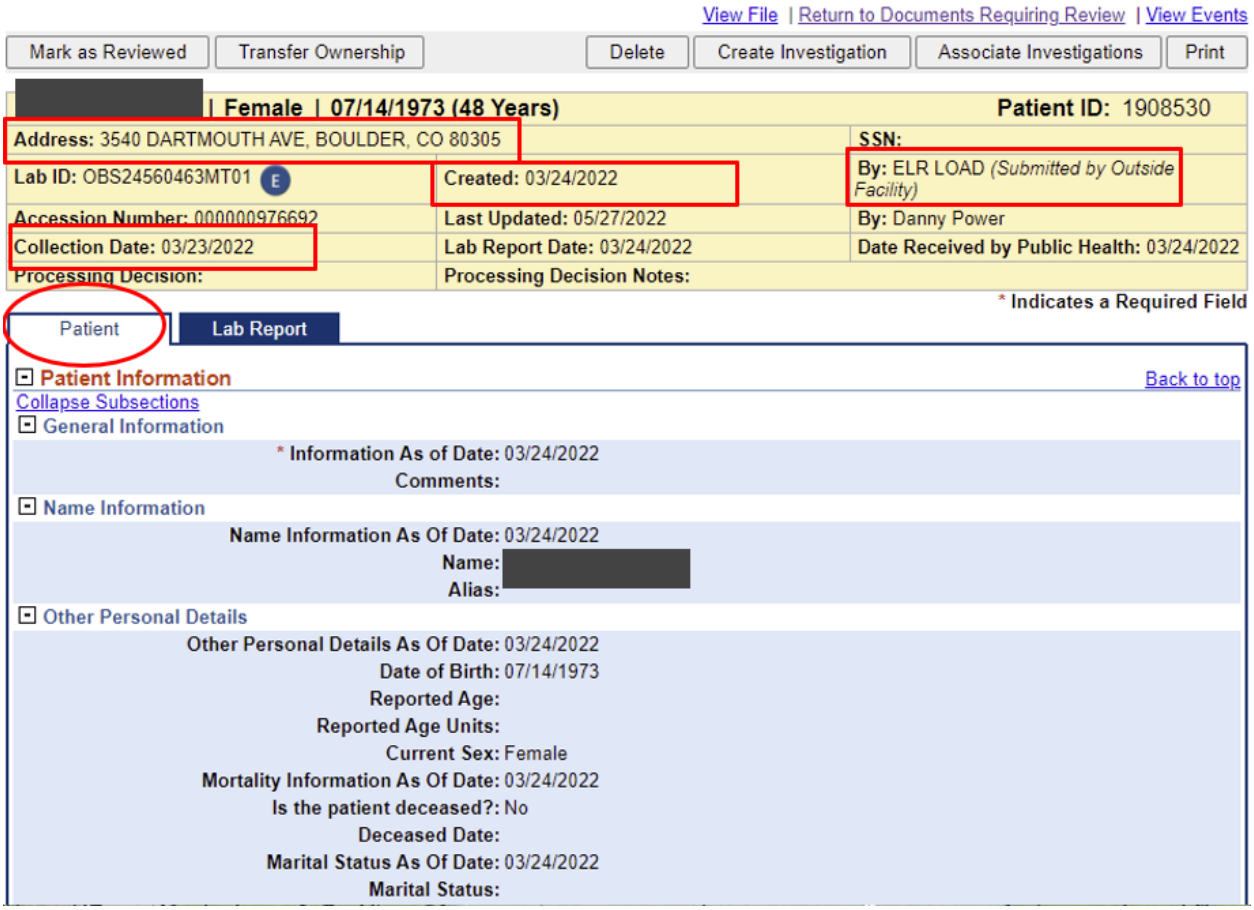
- AIDS or HIV infection
- Anaplasmosis
- Arboviral diseases
- Arsenic poisoning
- Babesiosis
- Cadmium poisoning
- Campylobacteriosis
- Candida auris (C. auris)
- Chancroid
- Chlamydial trachomatis infection
- Cholera
- Coccidioidomycosis
- Colorado tick fever
- Cryptosporidiosis
- Cyclosporiasis
- Dengue virus infections
- Giardiasis
- Gonorrhea
- Haemophilus influenzae, invasive disease
- Hansen's disease (leprosy)
- Hantavirus pulmonary syndrome or infection
- Hemolytic uremic syndrome, post diarrheal
- Hepatitis A, acute
- Hepatitis B, acute, chronic, perinatal
- Hepatitis C, acute, chronic
- Lead Poisoning
- Legionellosis
- Leptospirosis
- Listeriosis
- Lyme disease
- Malaria
- Meningococcal disease (Neisseria meningitidis)
- Mercury poisoning
- Mumps
- Pertussis
- Psittacosis
- Q-fever
- Salmonellosis (including Salmonella Typhi and Paratyphi)
- Shigellosis
- Spotted fever rickettsiosis
- Streptococcus pneumoniae, invasive disease
- Streptococcal toxic shock syndrome (STSS
- Tetanus
- Tickborne relapsing fever
- Toxic shock syndrome (nonstreptococcal) TSS)
- Transmissible spongiform encephalopathies
- Trichinellosis (trichinosis)
- Tuberculosis (TB) including latent tuberculosis infection
- Varicella (chickenpox)
- Vibrio cholera infection (cholera)
- Vibriosis
- Yellow fever

Thank you for flying with CDEpi Airlines. We hope you enjoyed your journey.

Sam Saycich, MPH
Samantha.Saycich@mt.gov
406-444-0018

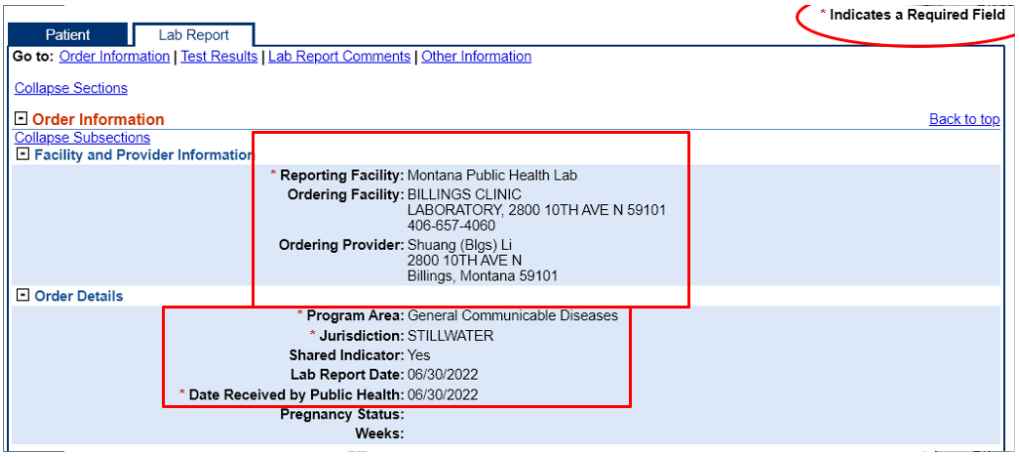
Patient Information

- Information for investigations
    - Contact information
    - Date received by public health
    - Submitted by
    - Collection date
    - Gender
    - Data needed for reconciliation
        - Race
        - Ethnicity



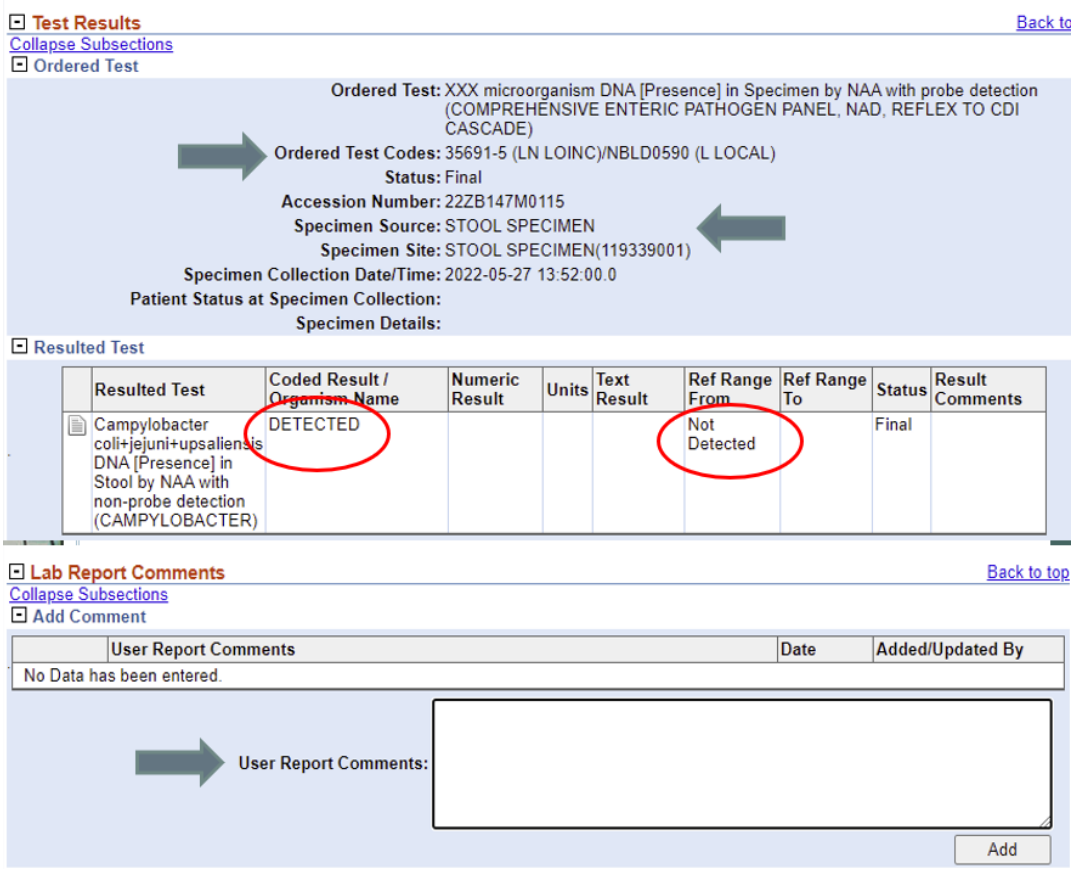
Test Information

- Reporting and ordering facility
- Ordering provider
- Program area
- Jurisdiction
- Lab report date
- Date received by public health



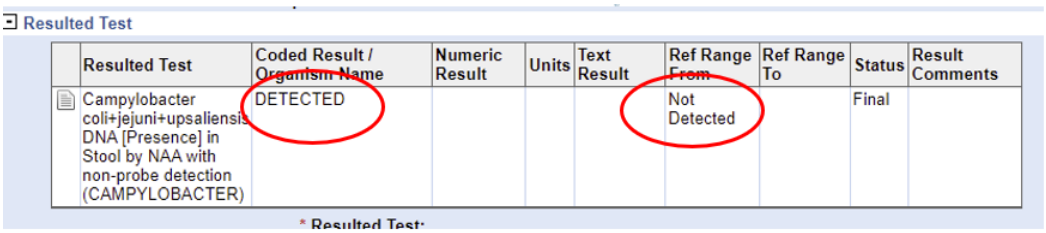
Test Information

- Ordered test
- Specimen source
- Specimen collection date
- Resulted test
- Coded result
- Reference range
- Lab comments



Results vs. Reference Range

- Coded result = Test result
- Reference range = Test result if the condition is not detected
- Compare the coded result with the reference range in interpreting the lab

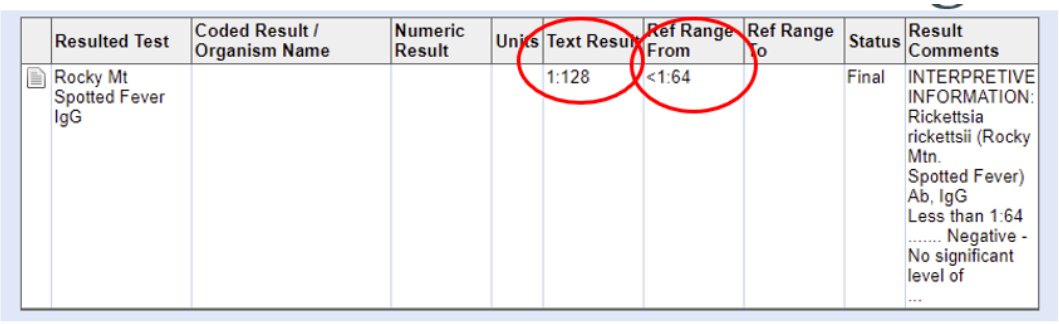


Resulted Test

Resulted Test	Coded Result / Organism Name	Numeric Result	Units	Text Result	Ref Range From	Ref Range To	Status	Result Comments
Campylobacter coli+jejuni+upsaliensis DNA [Presence] in Stool by NAA with non-probe detection (CAMPYLOBACTER)	DETECTED				Not Detected		Final	

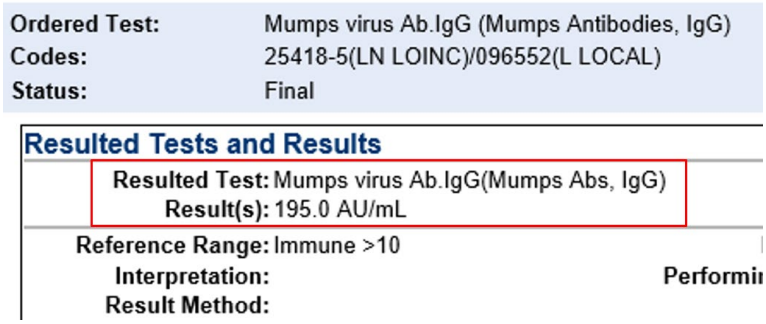
* Resulted Test:

- Text result = Test result
- Reference range = The test result if the condition is not detected
- **Compare the coded result with the reference range in interpreting the lab



Resulted Test	Coded Result / Organism Name	Numeric Result	Units	Text Result	Ref Range From	Ref Range To	Status	Result Comments
Rocky Mt Spotted Fever IgG				1:128	<1:64		Final	INTERPRETIVE INFORMATION: Rickettsia rickettsii (Rocky Mtn. Spotted Fever) Ab, IgG Less than 1:64 ..... Negative - No significant level of ...

IgG vs. IgM

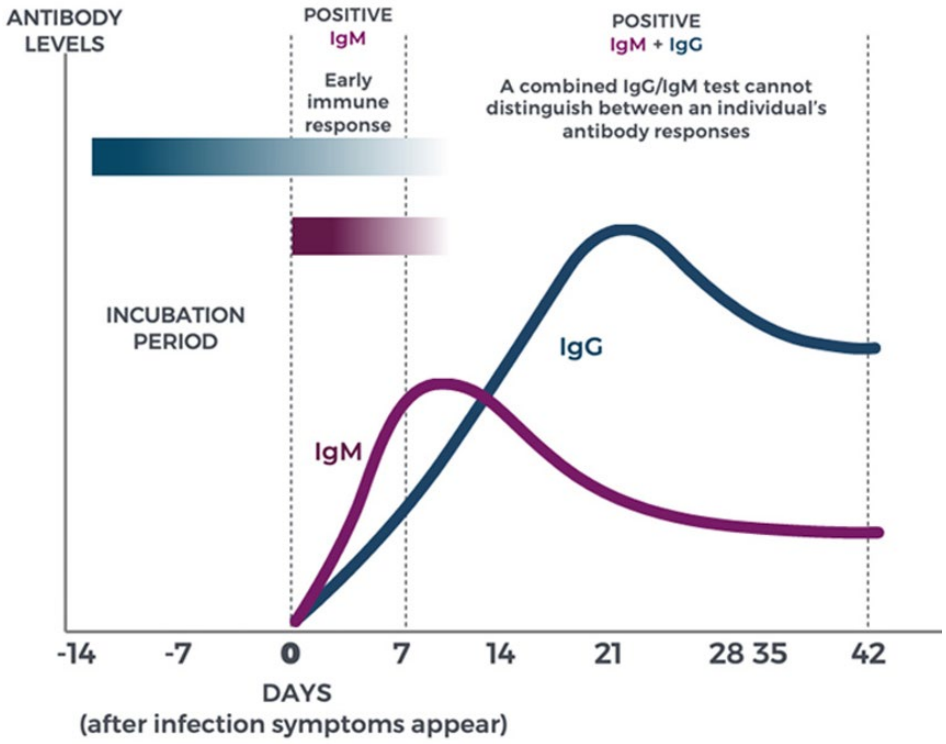


Ordered Test: Mumps virus Ab.IgG (Mumps Antibodies, IgG)
Codes: 25418-5(LN LOINC)/096552(L LOCAL)
Status: Final

Resulted Tests and Results

Resulted Test: Mumps virus Ab.IgG(Mumps Abs, IgG)
Result(s): 195.0 AU/mL

Reference Range: Immune >10
Interpretation:
Result Method:
Performi



Does specimen source matter?

Test Results — **Does specimen source matter?** — Back to

Collapse Subsections

Ordered Test

Ordered Test: XXX microorganism DNA [Presence] in Specimen by NAA with probe detection (COMPREHENSIVE ENTERIC PATHOGEN PANEL, NAD, REFLEX TO CDI CASCADE)
Ordered Test Codes: 35691-5 (LN LOINC)/NBLD0590 (L LOCAL)
Status: Final
Accession Number: 22ZB147M0115
Specimen Source: STOOL SPECIMEN
Specimen Site: STOOL SPECIMEN(119339001)
Specimen Collection Date/Time: 2022-05-27 13:52:00.0
Patient Status at Specimen Collection:
Specimen Details:

Resulted Test

Resulted Test	Coded Result / Organism Name	Numeric Result	Units	Text Result	Ref Range From	Ref Range To	Status	Result Comments
Campylobacter coli+jejuni+upsaliensis DNA [Presence] in Stool by NAA with non-probe detection (CAMPYLOBACTER)	DETECTED				Not Detected		Final	

Does specimen source matter?

Yes

- For some conditions, the specimen source will determine if this is a case. The sample may need to be from a specific or sterile site for diagnosis
- For example, *Haemophilus influenzae* must be from a sterile site such as blood or cerebrospinal fluid

When should labs be transferred to DPHHS?

- Labs should be transferred to DPHHS when they are out of the county or tribe's jurisdiction
- Work with your assigned epi
    - To contact out of state providers or facilities
    - If the patient is missing locating information and is not in ImTrax

Do all labs in MIDIS require disease investigation by local public health?

No

- There may be labs in MIDIS that aren't reportable, particularly if they are part of a panel
- Some labs do not diagnose a disease and can be marked as reviewed
- Other labs are for monitoring and may need to be attached to an existing investigation

Who do I call if I have questions about a topic?

- We have created a resource highlighting the subject matter expert for reportable diseases and conditions
- This shows both diseases and topics in alpha order
- Primary SME and phone number
- Secondary contacts, as appropriate

NOTE: This is not the same as the reportable disease poster. This is an expanded list of *topics*

NOTE: <u>For internal use only</u>

MIDIS is down, now what?

- The requirements and timeliness for reporting diseases are unchanged
- By law, reports must be made to local public health
- Local public then reports to the state
- Should have a plan in place
    - Providers or labs call with results
    - Results may be faxed over
- Use your local partners!

Lab Results Entering MIDIS

In 2019, MIDIS received 37,063 through ELR. About how many labs did MIDIS receive in 2021?

- 1) 900,000
- 2) 1,500,000
- 3) 6,000,000
- 4) 9,000,000

THANK YOU FOR ALL OF YOUR HARD WORK!
Questions?

Answer to above question = Choice 4

Exploring Case Definition and Case Status

Erika Baldry, MPH, CIC

Case Status

NNDSS: National Notifiable Diseases Surveillance System (NNDSS)

Reportable or Notifiable: What's the Difference?

Reportable Diseases and Conditions	Notifiable Diseases and Conditions
✔ Each state or territory sets local laws and rules for which diseases and conditions must be reported.	✔ The Council of State and Territorial Epidemiologists and CDC identify the list of notifiable diseases and conditions.
✔ Healthcare professionals, laboratories, hospitals, and other providers must tell public health departments when a person is diagnosed.	✔ States voluntarily inform CDC when a person meets certain criteria to become a case.*
✔ Public health departments collect information about the person and how they became ill.	✔ Case records do not contain personally identifiable information.
✔ This information is used to locate the source of an outbreak and prevent spread.	✔ CDC uses data to monitor, measure, and alert individual communities or the nation to outbreaks and other public health threats.
✔ The list of diseases and conditions can change every year.	✔ The list of about 120 diseases and conditions is updated every year.

Can you name a condition that's reportable in Montana but not nationally notifiable?

1)

2)

Surveillance Case Definition

- Uses a set of uniform criteria to define a disease for public health surveillance
- Enable public health officials to classify and count cases consistently
- Not intended to be used by healthcare providers to make clinical diagnosis or in determining how to meet an individual patient's health needs

Components of a Case Definition

- Background
- Clinical Criteria
- Laboratory Criteria
- Epidemiologic Linkage
- Criteria to Distinguish a New Case from an Existing Case
- Case Classification
- Comments

Tips and Tricks

- Look for **AND** vs **OR**
- Read the comments!
- Make sure you are using the most recent version of the case definition
- Some conditions require very specific symptoms

- Make sure the lab meets criteria (ie. is the titer meeting criteria?)

Example 1: Salmonellosis

Clinical Criteria

- An illness of variable severity commonly manifested by diarrhea, abdominal pain, nausea and sometimes vomiting. Asymptomatic infections may occur.

Laboratory Criteria

- Supportive: Detection of *Salmonella* spp. in a clinical specimen using CIDT (PCR or EIA).
- Confirmatory: Isolation (culture) of *Salmonella* spp. from a clinical specimen.

Epi Linkage

- Probable: A clinically compatible case that is epi linked to a case that meets supportive or confirmatory lab criteria for diagnosis

Case Classification

Probable

- A case that meets the supportive lab criteria OR a clinically compatible case that is epi linked to a case that meets the supportive or confirmatory lab criteria for diagnosis

Confirmed

- A case that meets the confirmatory laboratory criteria for diagnosis

Example 1: Salmonellosis

- You see a lab in MIDIS that shows a positive culture for *Salmonella*. When you perform a case investigation, you find out that the individual is experiencing diarrhea, abdominal pain, and nausea.
- **Is this a probable or confirmed case?**

Example 2: Lyme disease

Clinical Criteria

- An illness characterized by **one of the following** early or late-stage manifestations, *as reported by a healthcare provider*, and in the absence of another known etiology:
    - ***Erythema migrans (EM) rash***. For purposes of surveillance, EM is defined as a skin lesion (observed by a healthcare provider) that typically begins as a red macule or papule and expands over a period of days to weeks to form a large round lesion, often with partial central clearing. A single primary lesion must reach a size of ≥5 cm in diameter. *Note: Secondary lesions also may occur.*
    - ***Musculoskeletal system***. Recurrent, brief attacks (weeks or months) of objective joint swelling in one or a few joints. *Note: Objective joint swelling may sometimes be followed by chronic arthritis in one or a few joints.*
    - ***Nervous system***. Any of the following signs that cannot be explained by any other etiology, alone or in combination: lymphocytic meningitis; cranial neuritis, particularly facial palsy (unilateral or bilateral); radiculoneuropathy; or, rarely, encephalomyelitis.
    - ***Cardiovascular system***. Acute onset of high-grade (2nd-degree or 3rd-degree) atrioventricular conduction defects that resolve in days to weeks. *Note: Atrioventricular conduction defects may sometimes be associated with myocarditis.*

Laboratory Criteria

For the purposes of surveillance, laboratory evidence includes:

- ***Confirmatory laboratory evidence****:*
    - Isolation of *B. burgdorferi* sensu stricto or *B. mayonii* in culture, OR

- Detection of *B. burgdorferi* sensu stricto or *B. mayonii* in a clinical specimen by a *B. burgdorferi* group-specific nucleic acid amplification test (NAAT) assay, **OR**
- Detection of *B. burgdorferi* group-specific antigens by immunohistochemical assay on biopsy or autopsy tissues, **OR**
- Positive serologic tests[1] in a two-tier or equivalent format, including:
  - Standard two-tier test (STTT): a positive or equivocal first-tier screening assay, often an enzyme immunoassay [EIA] or immunofluorescence assay [IFA] for immunoglobulin M (IgM), immunoglobulin G (IgG), or a combination of immunoglobulins, followed by a concordant positive IgM[2] or IgG[3] immunoblot interpreted according to established criteria, **OR**
  - Modified two-tier test (MTTT): positive or equivocal first-tier screen, followed by a different, sequential positive or equivocal EIA in lieu of an immunoblot as a second-tier test[4].

- ***Presumptive laboratory evidence:***
  - Positive IgG immunoblot[5], interpreted according to established criteria[3], without positive or equivocal first-tier screening assay.

Don't forget to read the notes!

Note: The categorical labels used here to stratify laboratory evidence are intended to support the standardization of case classifications for public health surveillance. The categorical labels should not be used to interpret the utility or validity of any laboratory test methodology.

[1] Currently, there are no serologic tests available for *B. mayonii* infection, but cross-reactivity with *B. burgdorferi* testing may occur.

[2] IgM Western Blot (WB) is considered positive when at least two of the following three bands are present: 24 kDa (OspC)*, 39 kDa (BmpA), and 41 kDa (Fla). Low incidence states should disregard IgM results for specimens collected >30 days after symptom onset. *Depending upon the assay, OspC could be indicated by a band of 21, 22, 23, 24 or 25 kDA.

[3] IgG WB is considered positive when at least five of the following 10 bands are present: 18 kDa, 24 kDa (OspC)*, 28 kDa, 30 kDa, 39 kDa (BmpA), 41 kDa (Fla), 45 kDa, 58 kDa (not GroEL), 66 kDa, and 93 kDa. *Depending upon the assay, OspC could be indicated by a band of 21, 22, 23, 24 or 25 kDA.

[4] The MTTT algorithm should be performed using assays specifically cleared by the US Food and Drug Administration (FDA) for this purpose. (Mead et al, 2019)

[5] While a single IgG WB is adequate for surveillance purposes, a two-tier test is still recommended for clinical diagnosis.

Case Classification

Suspect

- High-incidence jurisdictions (as defined in Case Classification Comments below)
  - A case that meets presumptive laboratory evidence.
- Low-incidence jurisdictions (as defined in Case Classification Comments below)
  - A case that meets confirmatory or presumptive laboratory criteria, but no clinical information is available, **OR**
  - A case of *erythema migrans* rash with no laboratory evidence of infection.

Probable

- High-incidence jurisdictions (as defined in Case Classification Comments below)
  - A case that meets confirmatory laboratory evidence.
- Low-incidence jurisdictions (as defined in Case Classification Comments below)
  - A clinically compatible case that meets presumptive laboratory criteria.

Confirmed

- High-incidence jurisdictions (as defined in Case Classification Comments below)
    - N/A
- Low-incidence jurisdictions (as defined in Case Classification Comments below)
    - A clinically compatible case that meets confirmatory laboratory criteria.

  Note: This CSTE case definition is intended solely for public health surveillance purposes and does not recommend diagnostic criteria for clinical partners to utilize in diagnosing patients with potential Lyme Disease.

But wait! There are more notes!

Case Classification Comments

High-incidence jurisdictions are those that have had an average Lyme disease incidence of ≥10 confirmed cases/100,000 population for a period of three consecutive years. At the time of CSTE position statement 21-ID-05 (spring 2021), those jurisdictions were: Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, Wisconsin, and the District of Columbia (http://www.cdc.gov/lyme/stats/tables.html).

Low-incidence jurisdictions are those that have not had an average Lyme disease incidence of ≥10 confirmed cases/100,000 population for a period of three consecutive years. Once ≥10 confirmed cases/100,000 population have been observed in a low-incidence jurisdiction for a period of three consecutive years, they become a high-incidence jurisdiction for the purposes of surveillance and should permanently switch reporting criteria.

For determining incidence for case classification and reporting purposes, calculations should be made at the state or territory level. Case classification for reporting should not be differentially applied at the subdivision level.

A clinically compatible case is defined as a case that meets the clinical criteria defined above.

Example 2: Lyme disease

- When you log into MIDIS you see a laboratory result for a positive EIA (antibody screen) and a positive IgM immunoblot.
- The individual reports that they had a tick exposure in Minnesota (high incidence) two weeks ago. The individual also reports an EM rash.
- Hint: Montana is a low-incidence state, so we use the low-incidence guidance (it's about where the individual resides, not where they were exposed)
- **What is this?**

Example 3: Q Fever (ACUTE)

Clinical Description

- Acute fever usually accompanied by rigors, myalgia, malaise, and a severe retrobulbar headache. Fatigue, night-sweats, dyspnea, confusion, nausea, diarrhea, abdominal pain, vomiting, non-productive cough, and chest pain have also been reported. Severe disease can include acute hepatitis, atypical pneumonia with abnormal radiograph, and meningoencephalitis. Pregnant women are at risk for fetal death and abortion. Clinical laboratory findings may include elevated liver enzyme levels, leukocytosis, and thrombocytopenia. Asymptomatic infections may also occur. Note: Serologic profiles of pregnant women infected with acute Q fever during gestation may progress frequently and rapidly to those characteristic of chronic infection.

Clinical Criteria

- Acute fever and one or more of the following: rigors, severe retrobulbar headache, acute hepatitis, pneumonia, or elevated liver enzyme levels.

Laboratory Criteria For Diagnosis

- Laboratory confirmed:
    - Serological evidence of a fourfold change in immunoglobulin G (IgG)-specific antibody titer to *C. burnetii* phase II antigen by indirect immunofluorescence assay (IFA) between paired serum samples, (CDC suggests one taken during the first week of illness and a second 3-6 weeks later, antibody titers to phase I antigen may be elevated or rise as well), **OR**
    - Detection of *C. burnetii* DNA in a clinical specimen via amplification of a specific target by polymerase chain reaction (PCR) assay, **OR**
    - Demonstration of *C. burnetii* in a clinical specimen by immunohistochemical methods (IHC), **OR**
    - Isolation of *C. burnetii* from a clinical specimen by culture.
- Laboratory supportive:
    - Has a single supportive IFA IgG titer of ≥1:128 to phase II antigen (phase I titers may be elevated as well).
    - Has serologic evidence of elevated phase II IgG or immunoglobulin M (IgM) antibody reactive with *C. burnetii* antigen by enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or latex agglutination.

  Note: For acute testing, CDC uses in-house IFA IgG testing (cutoff of ≥1:128), preferring simultaneous testing of paired specimens, and does not use IgM results for routine diagnostic testing.

Case Classification

Probable

- A clinically compatible case of acute illness (meets clinical evidence criteria for acute Q fever illness) that has laboratory supportive results for past or present acute disease (antibody to Phase II antigen) but is not laboratory confirmed.

Confirmed

- A laboratory confirmed case that either meets clinical case criteria or is epidemiologically linked to a lab confirmed case.

Example 3: Q Fever (CHRONIC)

Clinical Description

- Infection that persists for more than 6 months. Potentially fatal endocarditis may evolve months to years after acute infection, particularly in persons with underlying valvular disease. Infections of aneurysms and vascular prostheses have been reported. Immunocompromised individuals are particularly susceptible. Rare cases of chronic hepatitis without endocarditis, osteomyelitis, osteoarthritis, and pneumonitis have been described.

Clinical Criteria

- Newly recognized, culture-negative endocarditis, particularly in a patient with previous valvulopathy or compromised immune system, suspected infection of a vascular aneurysm or vascular prosthesis, or chronic hepatitis, osteomyelitis, osteoarthritis, or pneumonitis in the absence of other known etiology.

Laboratory Criteria For Diagnosis

- Laboratory confirmed:
    - Serological evidence of IgG antibody to *C. burnetii* phase I antigen ≥ 1:800 by IFA (while phase II IgG titer will be elevated as well; phase I titer is higher than the phase II titer), **OR**

    - Detection of *C. burnetii* DNA in a clinical specimen via amplification of a specific target by PCR assay, **OR**
    - Demonstration of *C. burnetii* antigen in a clinical specimen by IHC, **OR**
    - Isolation of *C. burnetii* from a clinical specimen by culture.
- Laboratory supportive:
    - Has an antibody titer to *C. burnetii* phase I IgG antigen ≥1:128 and < 1:800 by IFA.

Case Classification

Probable

- A clinically compatible case of chronic illness (meets clinical evidence criteria for chronic Q fever) that has laboratory supportive results for past or present chronic infection (antibody to Phase I antigen).

Confirmed

- A clinically compatible case of chronic illness (meets clinical evidence criteria for chronic Q fever) that is laboratory confirmed for chronic infection.

Example 3: Q Fever (EXPERT LEVEL EXAMPLE)

- An individual presents to the ER complaining of a fever, myalgia, and malaise. The patient notes that they helped birth baby goats a week ago.
- The provider orders testing for Q fever and receives the following titer:
    - Phase 2 IgG: 1:512
    - Phase 1 IgG: 1:64
- Does this individual meet the clinical criteria?
- Is this chronic or acute Q fever?
- Is a single antibody titer confirmatory or supportive laboratory evidence?
- Is this a probable case or confirmed?

Questions?

Thank you for exploring case definitions with me! I hope that you learned some tricks to make things a little bit easier. As always, please feel free to contact the subject matter expert if you would like assistance working through case definitions!

Answers:

Example 1: Salmonellosis

- Is this a probable or confirmed case? **CONFIRMED**

Example 2: Lyme disease

- **What is this?**

Case Classification

Suspect

High-incidence jurisdictions (as defined in Case Classification Comments below)

- A case that meets presumptive laboratory evidence.

Low-incidence jurisdictions (as defined in Case Classification Comments below)

- A case that meets confirmatory or presumptive laboratory criteria, but no clinical information is available, **OR**
- A case of *erythema migrans* rash with no laboratory evidence of infection.

Probable

High-incidence jurisdictions (as defined in Case Classification Comments below)

- A case that meets confirmatory laboratory evidence.

Low-incidence jurisdictions (as defined in Case Classification Comments below)

- A clinically compatible case that meets presumptive laboratory criteria.

Confirmed

High-incidence jurisdictions (as defined in Case Classification Comments below)

- N/A

Low-incidence jurisdictions (as defined in Case Classification Comments below)

- A clinically compatible case that meets confirmatory laboratory criteria.

Example 3: Q Fever (EXPERT LEVEL EXAMPLE)

- Does this individual meet the clinical criteria? **YES**
- Is this chronic or acute Q fever? **ACUTE**
- Is a single antibody titer confirmatory or supportive laboratory evidence? **SUPPORTIVE**
- Let's put it all together:
    - Acute
    - Clinical criteria met
    - Supportive lab evidence
- Is this a probable case or confirmed? **PROBABLE**

Module 2

The Wild World of Outbreak Investigation in Montana

Rachel Hinnenkamp, MPH, Devon Cozart, MPH, CPH

Learning Objectives

- Define outbreak-specific terms
- List the steps of an outbreak investigation
- Understand the different types of epi curves
- Learn how to apply control measures to common types of outbreaks seen in MT

Outbreak Definitions

What is an outbreak?

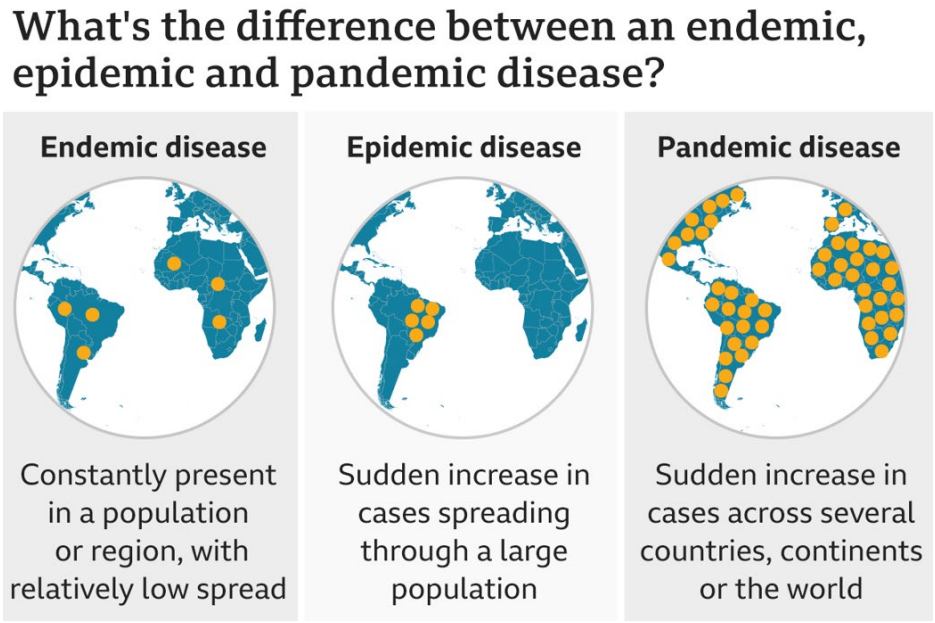
- ARM 37.114.101 (25) - "Outbreak" means the occurrence of more cases of a disease than would normally be expected in a specific place or group of people over a given period of time
- ARM 37.114.101 (28) – "Potential outbreak" means the presence or suspected presence of a communicable disease in a population where the number of susceptible persons and the mode of transmission of the disease may cause further transmission of that disease
- NORS (National Outbreak Reporting System) – two or more cases of a similar illness associated with a common exposure (foodborne/waterborne)

Outbreak Definition – Real Life Application

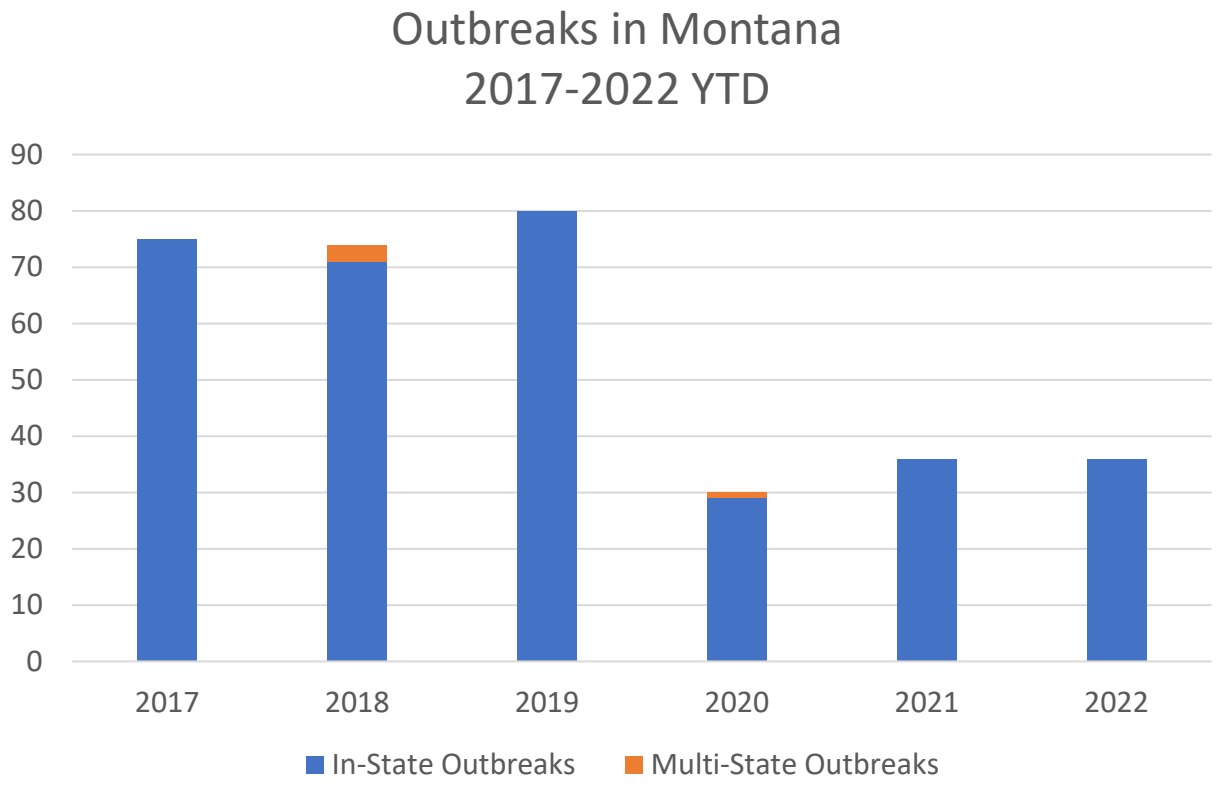
- MTDPHHS outbreak protocol:
    - An outbreak is defined as more cases of a particular disease or condition than expected over a given period
    - A single unusual illness (e.g. botulism, human rabies) is NOT considered an outbreak, but is considered a significant public health event that requires investigation

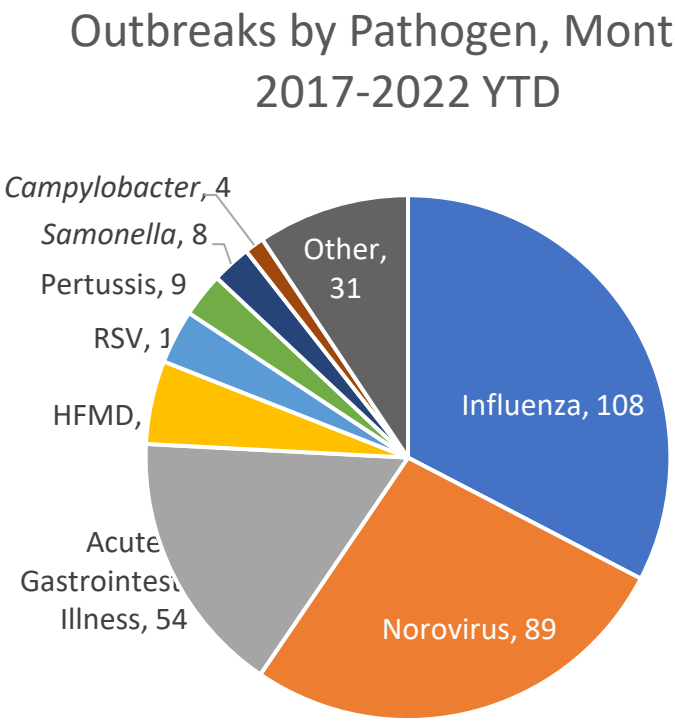
Outbreak Terms

- Endemic –the constant presence/usual prevalence of a disease or infectious agent in a population within a geographic area (e.g. baseline)
- Epidemic –an often-sudden increase in the number of cases of a disease above what is normally expected in that population in that area
- Pandemic – an epidemic that has spread over several countries or continents, usually affecting a large number of people
- Sporadic – refers to a disease that occurs infrequently and irregularly



State of the State:
Outbreak Investigations in Montana
Number of outbreaks reported in Montana since 2017 = 331





Settings of Outbreaks, Montana, 2017 – 2022 YTD

Setting	Number of Outbreaks
Long Term Care	**102**
Assisted Living	**57**
Daycare/Childcare	**54**
School	**41**
Hospital	**10**
Restaurant	**7**
Other	**60**

How are outbreaks reported?

- Surveillance of reportable diseases
  - MIDIS: e.g. increase in *Campylobacter* lab reports in your queue
  - MTPHL sequences enteric disease isolates, notifies CDEpi which cases are linked to each other
- Complaints/complaint systems
  - e.g. 3 people call your health department to complain about getting a GI illness after eating at a food truck

- Key surveillance partners (KSP)
    - e.g. Your local LTCF notices an increase in the number of residents with influenza-like illness symptoms
- The "astute physician"
    - e.g. Notices four patients have a similar rash after getting a piercing at the same establishment

What outbreaks are reportable?

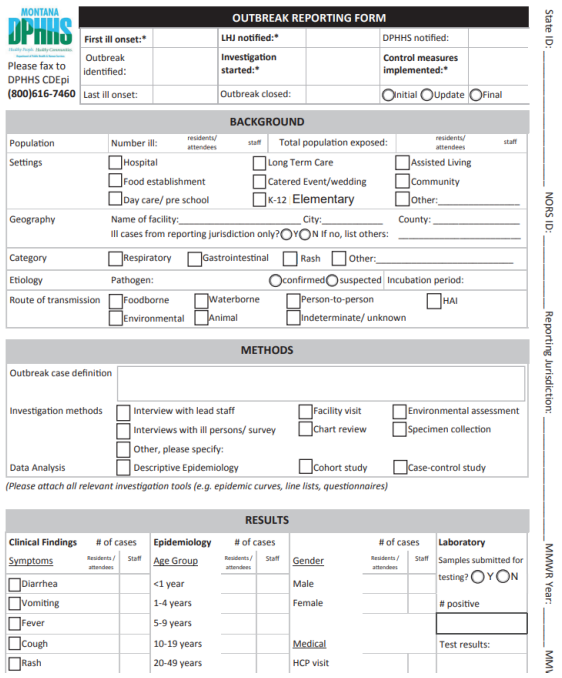
ARM 37.11.203

- Gastroenteritis outbreak
- Outbreak of any communicable disease listed in the CCDM in an institutional or congregate setting

Reporting Requirements and Timelines

- 37.114.201 - any person, including a physician, dentist, nurse, medical examiner, other health care practitioner, administrator of a health care facility or laboratory, public or private school administrator, or laboratory professional who knows or has reason to believe that a case exists of a reportable disease or condition defined in ARM 37.114.203 must immediately report to the local health officer
- 37.114.204 - (2) A local health officer must transmit by telephone or secure electronic means to the department the information required by ARM 37.114.205(1) and (2) for each suspected or confirmed case of one of the following diseases, within the time limit noted for each:
    - (a) Information about a case of one of the following diseases should be submitted within 24 hours after it is received by the local health officer:
    - (i) an outbreak of a disease or condition specified in ARM 37.114.203;
    - ....
    - (v) Gastroenteritis outbreak;

How to Report to DPHHS



OUTBREAK REPORTING FORM

Please fax to DPHHS CDEpi (800)616-7460

First ill onset:* | LHJ notified:* | DPHHS notified:
Outbreak identified: | Investigation started:* | Control measures implemented:*
Last ill onset: | Outbreak closed: | ◯Initial ◯Update ◯Final

BACKGROUND

Population | Number ill: residents/attendees staff | Total population exposed: residents/attendees staff
Settings | ☐Hospital ☐Long Term Care ☐Assisted Living ☐Food establishment ☐Catered Event/wedding ☐Community ☐Day care/ pre school ☐K-12 Elementary ☐Other:
Geography | Name of facility: City: County: Ill cases from reporting jurisdiction only? ◯Y ◯N If no, list others:
Category | ☐Respiratory ☐Gastrointestinal ☐Rash ☐Other:
Etiology | Pathogen: ◯confirmed ◯suspected | Incubation period:
Route of transmission | ☐Foodborne ☐Waterborne ☐Person-to-person ☐HAI ☐Environmental ☐Animal ☐Indeterminate/ unknown

METHODS

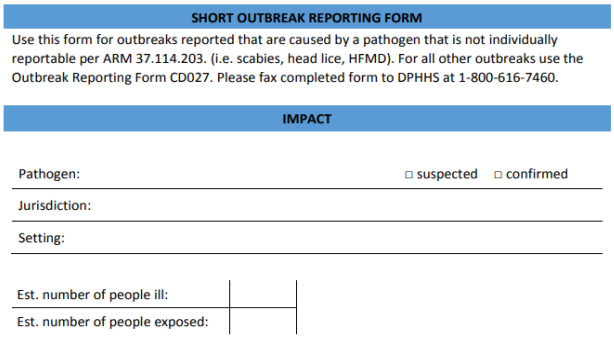
Outbreak case definition
Investigation methods | ☐Interview with lead staff ☐Facility visit ☐Environmental assessment ☐Interviews with ill persons/ survey ☐Chart review ☐Specimen collection ☐Other, please specify:
Data Analysis | ☐Descriptive Epidemiology ☐Cohort study ☐Case-control study

(Please attach all relevant investigation tools (e.g. epidemic curves, line lists, questionnaires)

RESULTS

Clinical Findings	# of cases Residents / attendees	Staff	Epidemiology	# of cases Residents / attendees	Staff		# of cases Residents / attendees	Staff	Laboratory
Symptoms			Age Group			Gender			Samples submitted for testing? ◯Y ◯N
☐Diarrhea			<1 year			Male			
☐Vomiting			1-4 years			Female			# positive
☐Fever			5-9 years						
☐Cough			10-19 years			Medical			Test results:
☐Rash			20-49 years			HCP visit			

State ID: NORS ID: Reporting Jurisdiction: MMWR Year: MMWR



SHORT OUTBREAK REPORTING FORM

Use this form for outbreaks reported that are caused by a pathogen that is not individually reportable per ARM 37.114.203. (i.e. scabies, head lice, HFMD). For all other outbreaks use the Outbreak Reporting Form CD027. Please fax completed form to DPHHS at 1-800-616-7460.

IMPACT

Pathogen: ☐ suspected ☐ confirmed
Jurisdiction:
Setting:

Est. number of people ill:
Est. number of people exposed:

PREVENTION

When was this reported to local health jurisdiction?
What interventions have been put in place by facility?
What resources were provided to facility after report?
Follow up required? ☐ Yes ☐ No
Additional comments:

10 Steps of an Outbreak Investigation

1. Identify investigation team and resources
2. Establish existence of an outbreak
3. Confirm the diagnosis
4. Construct outbreak case definition
5. Find cases systematically and develop line listing
6. Perform descriptive epidemiology/develop hypotheses
7. Evaluate hypotheses/perform additional studies as necessary
8. Implement control measures
9. Communicate findings
10. Maintain surveillance

1. Identify investigation team and resources

- Team: public health nurses, sanitarians, laboratory, emergency preparedness, DPHHS, key surveillance partners, others
- Resources: understand the reporting rules in Montana, stay up to date on emerging public health issues in neighboring areas, learn about your local public health disease response plan

2. Establish existence of an outbreak

- What is the baseline rate of disease? How many cases would you normally expect given:
    - Pathogen
    - Setting
    - Seasonality
    - Timeframe

  Use MIDIS for this!!!

3. Confirm the diagnosis

- Laboratory results – prefer two or more specimens to confirm an outbreak etiology
- Clinical criteria – signs and symptoms may help determine what pathogen is suspected, before testing is completed
- Use the disease-specific case definition
- Confirming the diagnosis gives us information on possible transmission methods, incubation periods, and treatment options

Medical Diagnosis vs. Case Definition

Authority	**Providers are practicing under a medical license and regulated under a licensing board**	**Public health law gives authority to enact control measures and request information on cases; oversight given by local board of health**

Providers treat the patient, public health prevents disease in a community. Follow the Council of State and Territorial Epidemiologists (CSTE) case definitions when defining a disease – the physician's diagnosis will not always line up.

4. Construct outbreak case definition

- Case definition – standard criteria for categorizing an individual as a case
- Outbreak case definition – defines who will be included as part of the outbreak
    - Person – characteristics of the cases
    - Place – location of the cases
    - Time – specified time period for this outbreak
    - Clinical information – signs and symptoms, or laboratory results

5. Find cases systematically and develop line listing

5a. Find cases systematically

- During an outbreak, enhanced surveillance is often necessary
    - Active surveillance – calling hospitals, long-term care facilities (LTCFs), hospitals, laboratories, etc. to ask if they have any potential cases
    - Share information with the media, or post about the outbreak on social media
- SEDRIC – System for Enteric Disease Response, Investigation and Coordination
    - CDEpi uses this system to actively look for enteric cases in other states that match by whole genome sequencing (WGS)

5b. Develop line listing

- Personal information: demographics, including age, race, occupation
- Signs and symptoms
- Laboratory test results
- Case information – onset date, hospitalization status, case ID
- Relevant exposures – e.g. for a foodborne disease investigation, list restaurants, grocery stores, and food items consumed

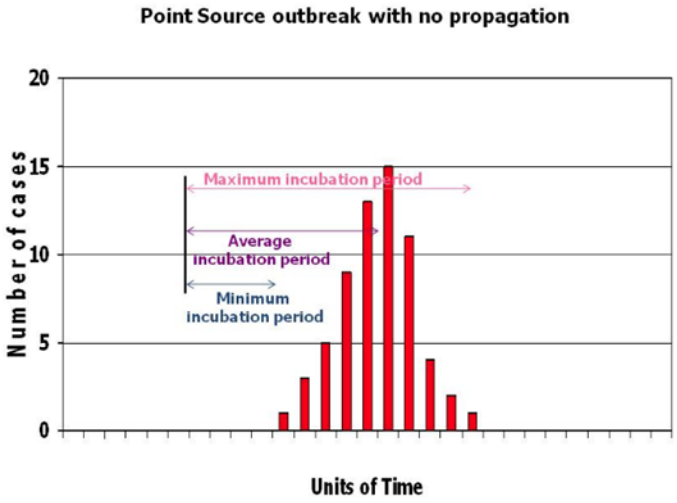
Case ID	Initials	Age	Sex	Date of Report	Onset Date	Nausea/ Vomiting	Diarrhea	Grocery store A	Restaurant B	Chicken
1	BT	33	M	7/1/22	6/28/22	No	Yes	Yes	No	Yes
2	MS	68	F	7/3/22	7/1/22	Yes	Yes	Yes	No	No
3	SF	18	F	7/3/22	6/29/22	Yes	Yes	Yes	Yes	No

6a. Perform descriptive epidemiology

- Descriptive epi characterizes the outbreak by person, place, and time
- Can provide clues about the source of the outbreak and modes of transmission
    - Use your line list and an epidemic curve
    - Epi curves characterize the outbreak by graphing the number of cases by date of illness onset

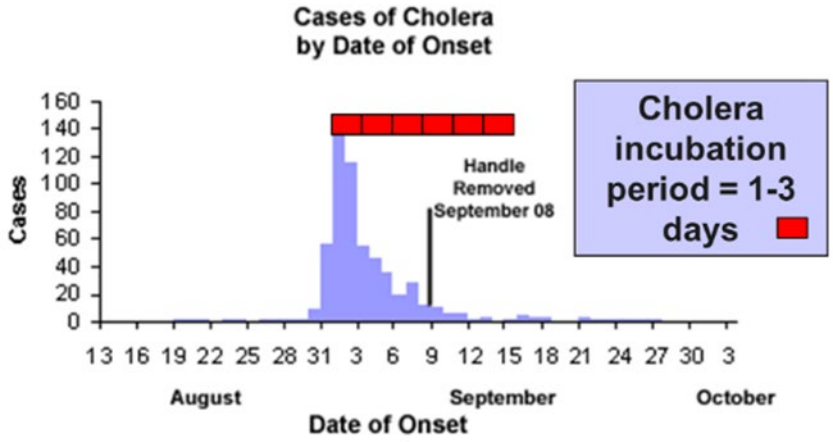
Point Source Outbreak

- A group of people are all exposed to a pathogen from a single source
- Cases occur within one incubation period
- Steep upslope and more gradual down slope



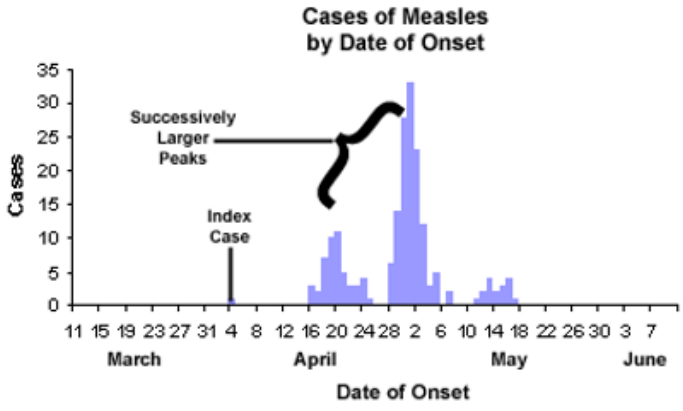
Common Source, Continuous Exposure Outbreak

- Cases do not all occur within a single incubation period, implying an ongoing source of infection



Propagated Outbreak

- Person-to-person transmission
- Peaks are one incubation period apart
- Increasing number of cases, until the pool of susceptible people is exhausted or control measures are implemented



6b. Generate Hypotheses

- Use the results of your descriptive epi and epi curve to form your hypothesis
- Consider what is known about the epidemiology of the disease
    - e.g. hepatitis A is often transmitted through food (contaminated item or sick food handler), or through IV drug use
        - Do the cases have a restaurant in common? Do any of them use IV drugs? Did they all mention frozen berries as part of their food history?

7. Evaluate hypotheses/perform additional studies as necessary

- If the source cannot be identified…keep investigating!
    - Could implement case control or cohort studies at this point, if need be
- Do more cases add additional epi information that will help solve the outbreak?

- Reevaluate hypothesis and adapt as necessary

8. Implement control measures

- CCDM – control measures for specific diseases
- ARMs
- Special circumstances
    - Facilities – restrict movement, cohort, exclude staff
    - Product – recall, remove from shelves, tell consumers to discard
    - Occupation – exclude if a sensitive setting
    - Prophylaxis for exposed individuals

9. Communicate findings

- Continuous throughout the outbreak
- Determine best methods, frequencies
    - Email, phone, group chat
- Audience – who needs to know when
    - Teammates, KSPs, the public
- Final summary report for record-keeping purposes

10. Maintain surveillance

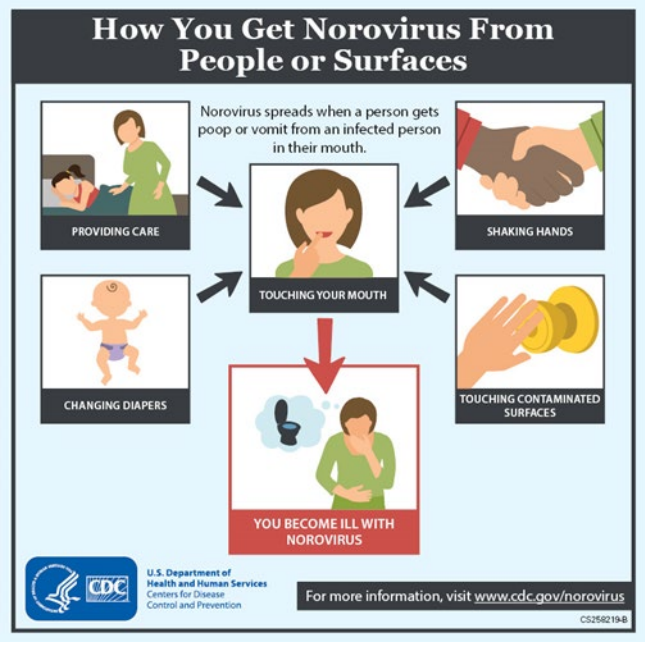
- Keep watching for new cases!
- Continue surveillance for 2-3 incubation periods past the last ill case
    - Depending on causative agent
    - Consider secondary cases
- If no new cases, declare outbreak over

Outbreak Response for 'Frequent Flyer' Diseases in Montana

Influenza - 108
Norovirus - 89
Acute Gastrointestinal Illness - 54

Norovirus

- Norovirus is not individually reportable
- Reportable under 'gastroenteritis outbreak' and 'outbreak in an institutional or congregate setting'
- Causes most enteric disease outbreaks in Montana



Epidemiology of Norovirus

Clinical description:

- Nausea, vomiting, diarrhea, abdominal pain, fever
- Typically lasts 24-72 hours
- Incubation period of 10-50 hours

Transmission – fecal-oral

- Person-to-person transmission
- Foodborne
- Waterborne
- Environmental transmission

10 Steps of an Outbreak Investigation: Norovirus

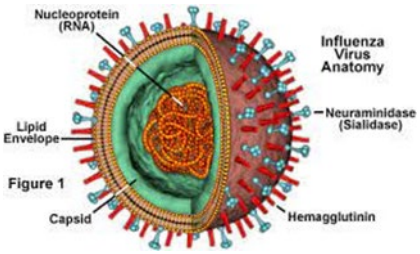
1. Identify investigation team and resources
    - Prior to the outbreak, create your norovirus response team
    - Familiarize yourself with norovirus outbreak response
2. Establish existence of an outbreak
    - More cases than expected in a specific setting during a specific time frame?
3. Confirm the diagnosis
    - Collect at least two specimens to submit for norovirus testing
4. Construct outbreak case definition
    - Person, place, time, clinical symptoms, laboratory testing
5. Find cases systematically and develop line listing
6. Perform descriptive epidemiology/develop hypotheses
7. Evaluate hypotheses/perform additional studies as necessary
8. Implement control measures
    - Environmental Cleaning – clean with a bleach solution, mix every 24 hours
    - Hand hygiene – use soap and water
    - Exclusion criteria – exclude sick daycare attendees, and sick staff at congregate settings for at
    - least 48 hours after symptoms resolve
        - 72-hour exclusion for those involved in food service and direct patient care
    - Congregate care setting – cohort ill residents, serve meals in rooms, cancel group activities
9. Communicate findings
    - Send outbreak summary to colleagues, KSPs, other stakeholders
10. Maintain surveillance
    - Close the outbreak when it has been 72 hours (2 average incubation periods) with no new cases

Available Resources for Norovirus Investigations

- Specimen collection kit – containers and collectors for the local health department to distribute
- to cases as necessary
- Available funding to cover the cost of testing of outbreak samples
- Norovirus Toolkit for Long-term Care facilities
- Infection Control Assessment and Response (ICAR)
- Letter to laboratories – submit specimens October-April

Seasonal Influenza in Montana

- Influenza as a reportable disease: weekly aggregate case counts are reportable, as well as
- individual hospitalizations and deaths
- Pre-COVID average case counts:
    - Cases: 11,754 per year
    - Hospitalizations: 753 per year
    - Deaths: 53 per year



Epidemiology of Influenza

- Influenza signs and symptoms usually start suddenly, and include some or all of these symptoms:
    - Fever, cough, sore throat, runny or stuffy nose, muscle/body aches, headaches, fatigue (children may experience vomiting and diarrhea)
    - Incubation period of 1 to 4 days (average of 2)

- Transmission: droplet transmission (through coughs, sneezes, etc.), through fomites (touching a surface with flu virus, then touching mouth, nose, or eyes)

10 Steps of an Outbreak Investigation: Influenza

1. Identify investigation team and resources
   - Prior to the outbreak, create your influenza response team
   - Familiarize yourself with influenza outbreak investigations
2. Establish existence of an outbreak
   - More cases than expected in a specific setting during a specific time frame?
3. Confirm the diagnosis
   - Collect at least two specimens to submit for influenza testing
4. Construct outbreak case definition
   - Person, place, time, clinical symptoms, laboratory testing
5. Find cases systematically and develop line listing
6. Perform descriptive epidemiology/develop hypotheses
7. Evaluate hypotheses/perform additional studies as necessary
8. Implement control measures
   - Prophylaxis – antivirals may be administered prophylactically to close contacts at high risk for
   - severe infection
   - Exclusion criteria – exclude daycare attendees or healthcare personnel* until they have been
   - fever-free for at least 24 hours
   - Congregate care setting – cohort ill residents, serve meals in rooms, cancel group activities
   - Manage with **standard** and **droplet** precautions
9. Communicate findings
   - Send outbreak summary to colleagues, KSPs, other stakeholders
10. Maintain surveillance
    - Close the outbreak when it has been 2-3 incubation periods with no new cases

    *additional restrictions may apply to HCP in protective environments

Influenza Resources

Interim Guidance for Influenza Outbreak Management in Long-Term Care and Post-Acute Care Facilities
Isolation Precautions
Prevention Strategies for Seasonal Influenza in Healthcare Settings

Resources

CCDM
MOIT – monthly meeting to discuss outbreak response
CDEpi Secret Website
CDEpi! – 406-444-0273

Questions?

Rachel Hinnenkamp
406-444-0649
rachel.hinnenkamp@mt.gov

Use of Technology in Investigations

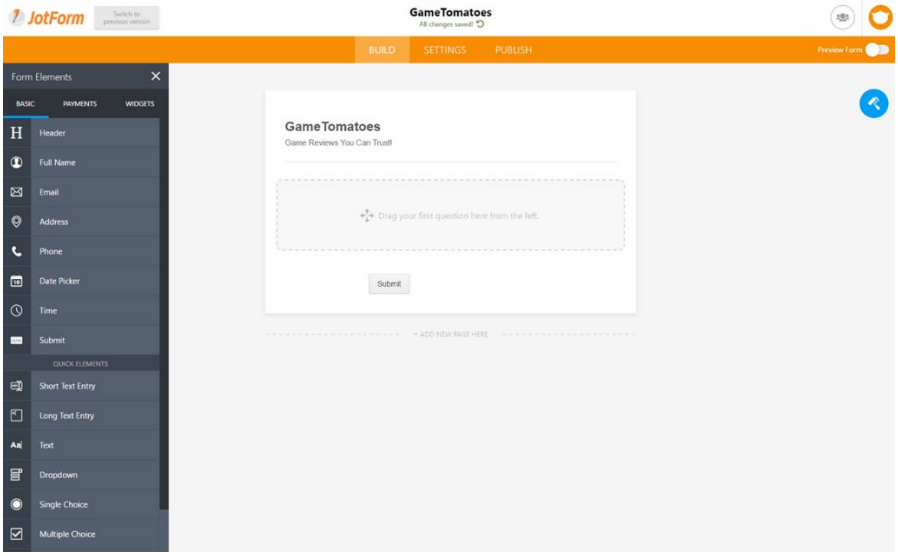
Meagan Gillespie, BS

Roadmap

01 What is JotForm
02 What is EZ Texting
03 Overall Process
04 Best Practices
05 Videos and Resources

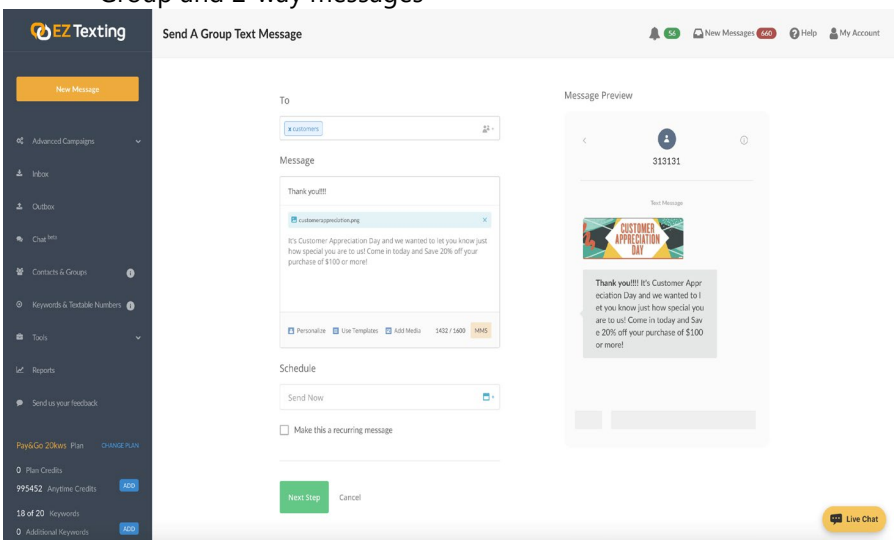
What is JotForm?

- HIPAA compliant questionnaire creator that automatically send form submission to email.
- Forms use conditional logic, generate reports, and automate workflows.

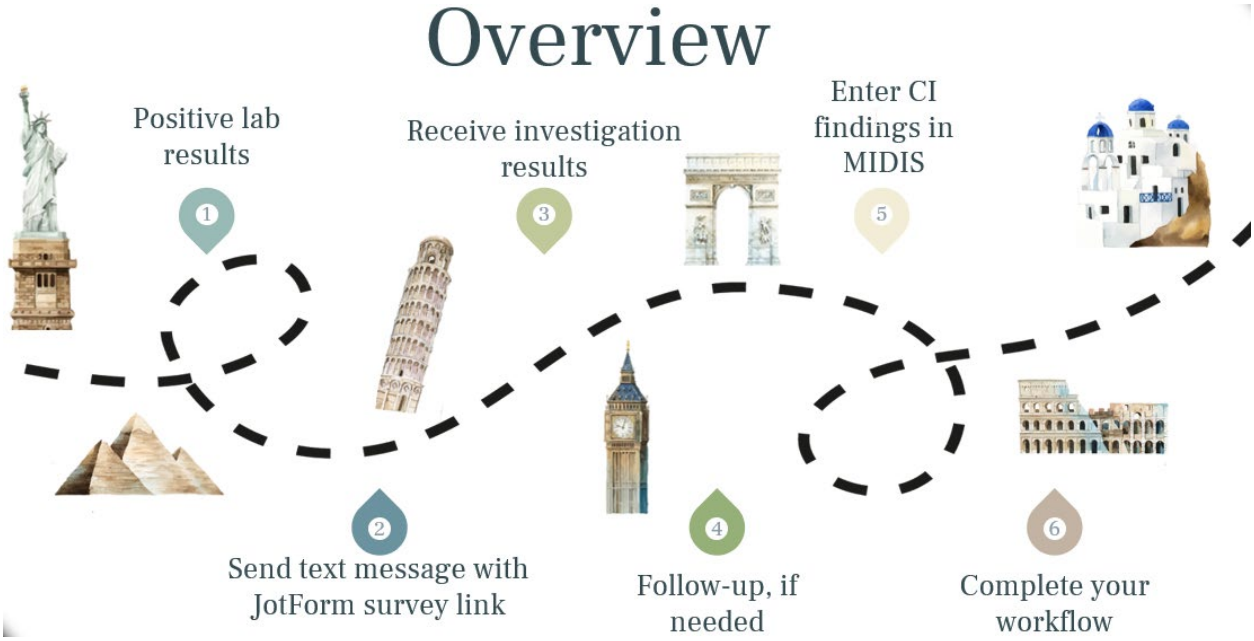


What is EZ Texting?

- Text messaging system (SMS and MMS)
- Group and 2-way messages



Overall Process



Workflow

- Designate an individual to oversee
- Identify population
- Prewrite text message(s)
- Follow-up procedure
- Track cases using an excel sheet
- Train staff

Excel Tracking Sheet

Name	Phone number	Sent survey	Response in 24 hours	Follow-up	Response after follow-up
Gillespie, Meagan	406-444-5563	07/21/2022	Yes	N/A	N/A
Last, First	406-111-1111	07/21/2022	No	Yes 07/23/2022	Yes
Last, First	406-111-1111	07/21/2022	Yes	Yes 07/23/2022	No

Best Practices

Community messaging

- Refer to UM presentation
- 5th grade reading level

Survey length

- 2-5 minutes
- 7 minutes max

Text message length

- Short and concise
- Include link to additional resources

Community feedback

- Adapt to needs of your community
- Messaging

Increase Response Rate

1) Target and Attract
   Personalize, engage, promote
   Partner with local groups, healthcare providers, pharmacies/drug stores, and testing location
2) Simplify
   Short, concise, and clear
3) Assure
   Community benefits, emphasize HIPAA compliance
4) Incentivize
   Individual will receive a phone call
5) Remind and Appreciate
   Follow up, publish response rate, gauge interest, and thank often

Videos and Resources

- How-to videos on JotForm and EZ texting can be found on CDEpi Section Resources page.

Examples of Templates Available

- Mass bat exposure
- COVID case investigation
- Hand Foot Mouth
- Meningococcal outbreak
- Traveler notification
- Traveler resources
- Back to school vaccines
- Appt scheduler
- LTBI
- Outbreak reporting
- Outbreak line list
- Bite reporting

Meagan.Gillespie@mt.gov
406-444-5563

Public Health Management of Syphilis

Cara Murolo, Jessica Lopeman, MPH, BSN, RN-BC, a-IPC

SYPHILIS OVERVIEW

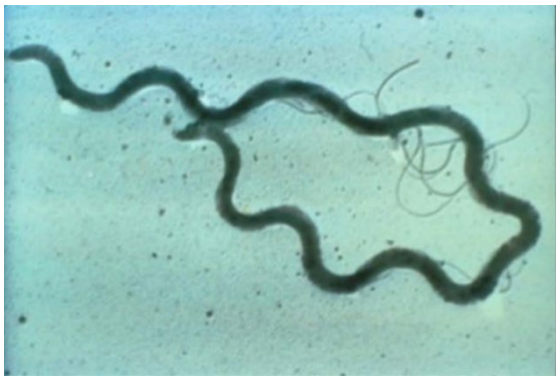
- Known as the "Great Imitator" because so many of the signs and symptoms are indistinguishable from other diseases
- One of the oldest diseases known to humans
- Caused by a corkscrew-shaped bacterium called *Treponema pallidum*

EPIDEMIOLOGY OF SYPHILIS

Microbiology, History, Pathophysiology, and Trends

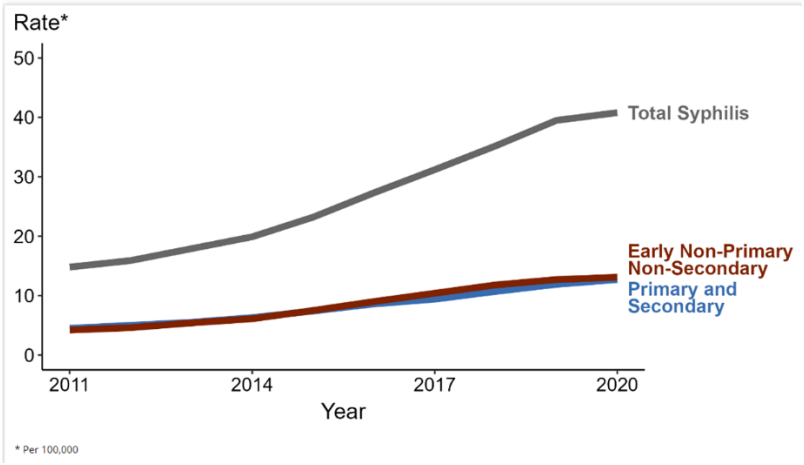
MICROBIOLOGY OF PATHOGEN

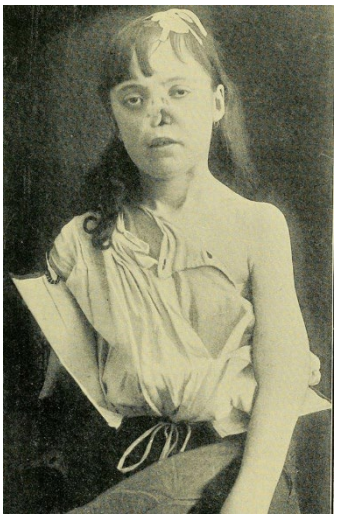
- Spirochete class
    - Corkscrew-shape, motile aerobic bacterium
- Transmitted through contact with lesion and vertically (mother to child)
- Transmission from blood transfusion have occurred (cannot survive over 24-48 hours in blood bank conditions)
- Enters skin and mucous membranes through abrasions during sexual contact or through the placenta from mother to child



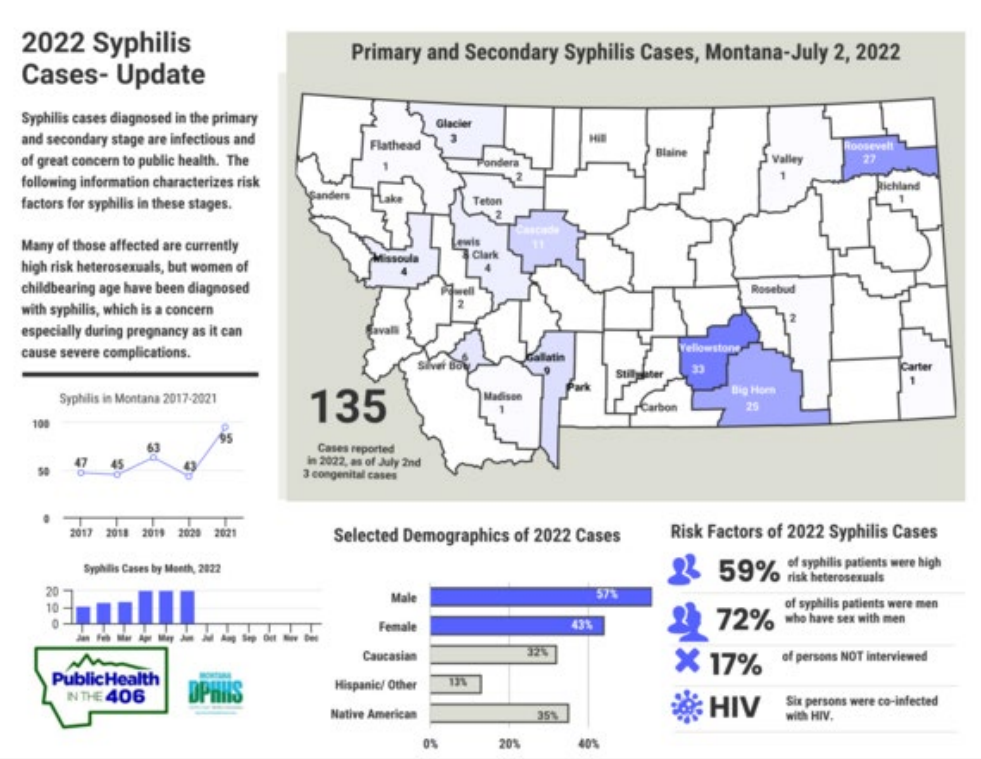
US SYPHILIS CASE RATES, 2011-2020

Syphilis — Rates of Reported Cases by Stage of Infection, United States, 2011–2020





TRENDS IN MONTANA
YTD SYPHILIS CASES
135 P & S syphilis cases
3 congenital syphilis case

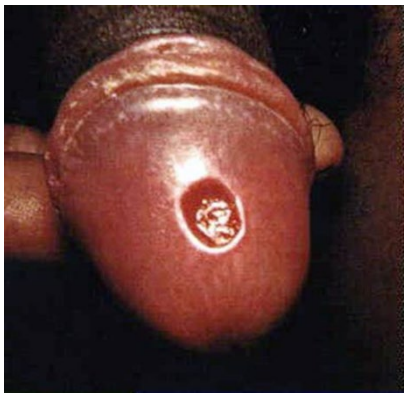


WARNING
Graphic Images

CLINICAL MANIFESTATIONS OF SYPHILIS
Signs, Symptoms, and Progression of Disease

PRIMARY SYPHILIS

- Appearance of chancre
- Painless ulcerated lesion
- Lesion appears 21 days (range 3-90) days after contact at site of exposure; may persist for average of 2-3 weeks, then resolves
- May also have regional lymphadenopathy (swollen lymph nodes)
- Found in a number of places, typically genitalia, can be on buttocks, oral cavity, etc.
- Serous drainage, described as "wet"
- May have multiple lesions (approx. 25%)

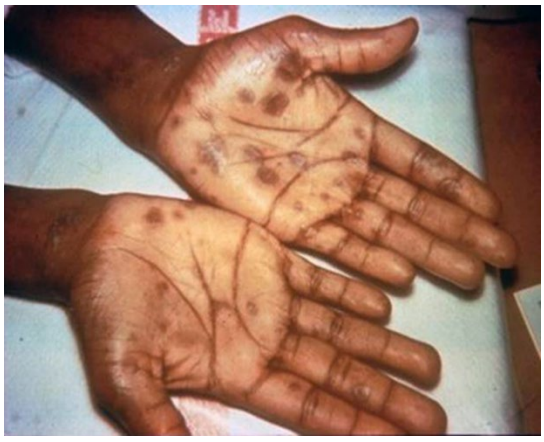


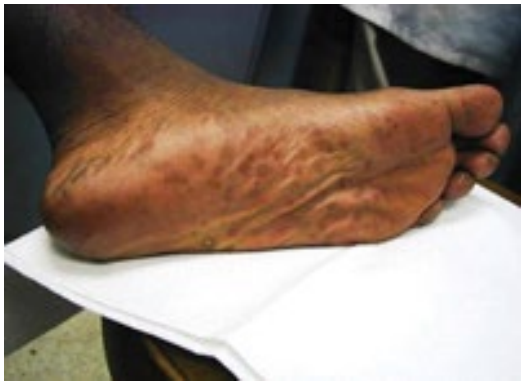
SECONDARY SYPHILIS

- Rash: 75% to 100% of patients with secondary syphilis.
    - The rash can be macular, papular, squamous, pustular (rarely), or a combination
    - Nonpruritic, and characteristically involves the chest, back, palms, and soles
- Lymphadenopathy: In 50% to 86% of cases
- Systemic Symptoms (malaise, fever, and other nonspecific constitutional symptoms)
- Mucous Patches: 6% to 30% of patients, flat patches located in the oral cavity, pharynx, larynx, or genital region.
- Condylomata Lata: 10% to 20% of patients will have moist, heaped-up, wart-like papules in warm intertriginous areas (most commonly gluteal folds, perineum, and perianal), these lesions are highly contagious.
- Alopecia (hair loss) about 5% of cases

Visceral Organ Involvement (one or more visceral organs, including liver, kidney, lungs, gastrointestinal tract, and spleen)

SECONDARY SYPHILIS-RASH ON PALMS AND SOLES





EARLY LATENT AND LATE LATENT SYPHILIS

- No clinical signs or symptoms are present to suggest infection
- The latent stage is defined as occurring within the first year after infection.
- Progresses to "late latent" if untreated; primary purpose for distinguishing between latent stages is treatment differences.

LATENT SYPHILIS - IS IT NEW, OR IS IT OLD?

- If the person has syphilis infection without symptoms

AND

- It can be established that the infection is less than one year in duration

THEN

- Treat for **new syphilis** (coming up soon!)

- If the person has syphilis infection without symptoms

AND

- The infection appears to be older than one year

THEN

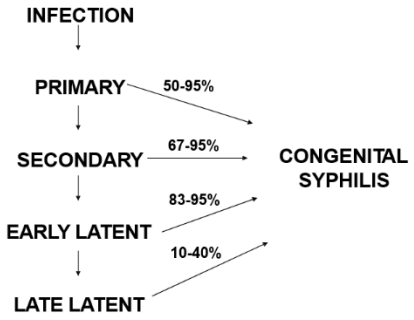
- Treat for **old syphilis** (coming up soon!)

SYPHILIS DURING PREGNANCY CAUSES FETAL HARM:

- Miscarriage
- Stillbirth
- Prematurity
- Low birth weight
- Death shortly after birth

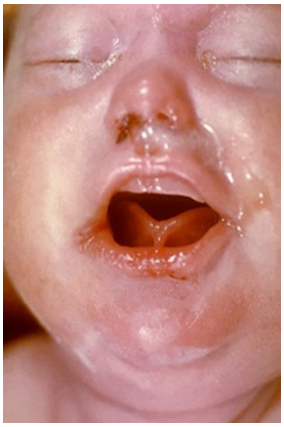
According to CDC, up to 40% of babies born to women with untreated syphilis may be stillborn or die from the infection as a newborn.

Congenital Syphilis by Maternal Stage



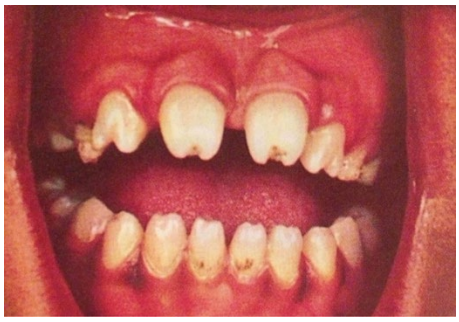
CONGENITAL SYPHILIS

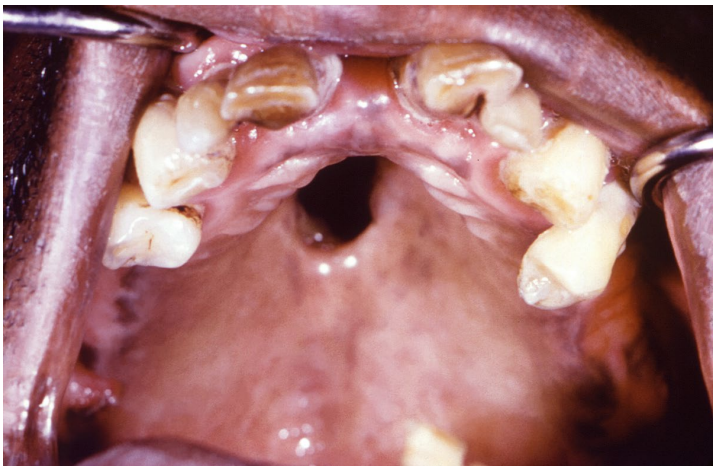
- Symptoms in the neonate are not always present
- In children less than two years, following may be seen:
    - Hepatosplenomegaly
    - Bone involvement is the most common specific manifestation and is seen in 60% to 80% of infected infants (long bones)
    - Skin (bullous or exudative lesions) or mucous membranes lesions
    - Alopecia, generalized lymphadenopathy, meningitis, osteitis, or osteochondritis can also occur.
    - Hematologic abnormalities such as thrombocytopenia and anemia

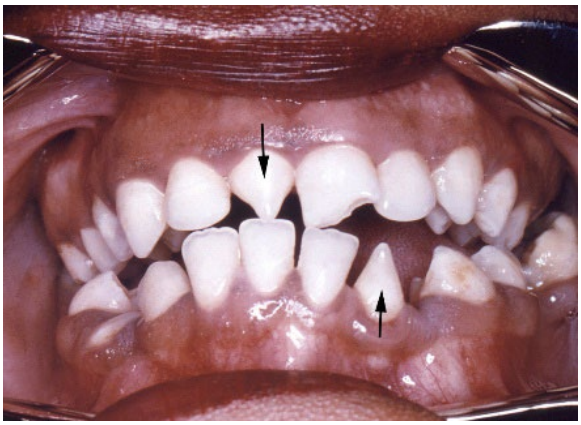


LATER MANIFESTATIONS OF CONGENITAL SYPHILIS

- Bone lesions
- Interstitial keratitis
- Perforation of the hard palate
- Hutchinson's teeth/molars
- Deafness
- Facial deformities, particularly on the nose

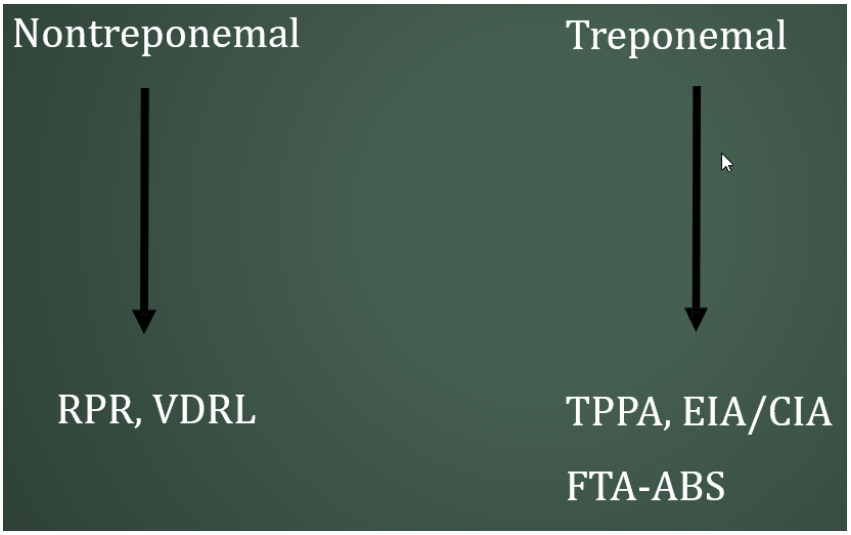






LABORATORY ANALYSIS FOR
***T. PALLIDUM* INFECTION**
Screening and Confirmatory Testing

SEROLOGICAL TESTING FOR SYPHILIS



SYPHILIS SEROLOGY: NONTREPONEMAL TESTS

RPR – Rapid Plasma Reagin

VDRL – Venereal Diseases Research Laboratory

- Used for screening, quantitation
- Detects antibody to a cardiolipin antigen – may be falsely positive

SYPHILIS SEROLOGY: TREPONEMAL TESTS

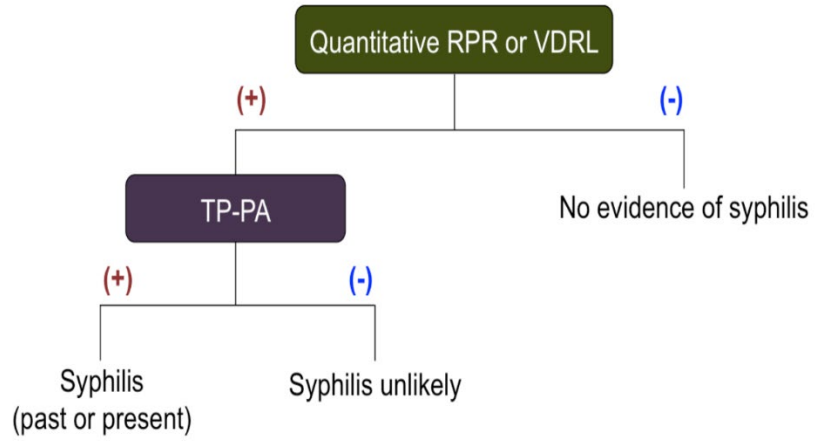
TPPA: Particle agglutination

FTA-ABS: Fluorescent Treponemal Antibody Adsorbed

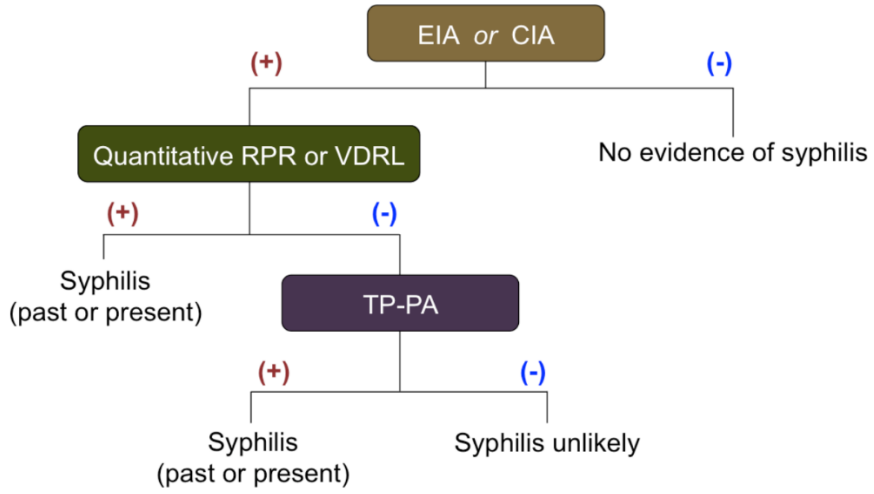
Enzyme/chemiluminescence Immunoassays (EIA/CIA)

- Used to confirm positive VDRL or RPR
- May remain positive after therapy; not useful if history of syphilis
- TPPA and EIA/CIA will likely be positive for a lifetime after infection.

TRADITIONAL SCREENING ALGORITHM



REVERSE SEQUENCE SCREENING ALGORITHM



CASE STUDIES

Case #1

- 33 yo male
- Penile lesion 6 weeks ago that resolved; now has fever to 101, malaise, full body rash, including on palms of hands/soles of feet
- RPR 1:64, TPPA Reactive

How Would You Stage This Patient?

A. Primary
B. Secondary
C. Early, non-primary, non-secondary
D. Unknown duration or late syphilis
E. Not a case

CASE #2

- 16 yo female
- Reports multiple partners in last 6 months
- Two ulcerated lesions visible on labia
- Lesions painful
- Rapid TPPA positive in the provider office

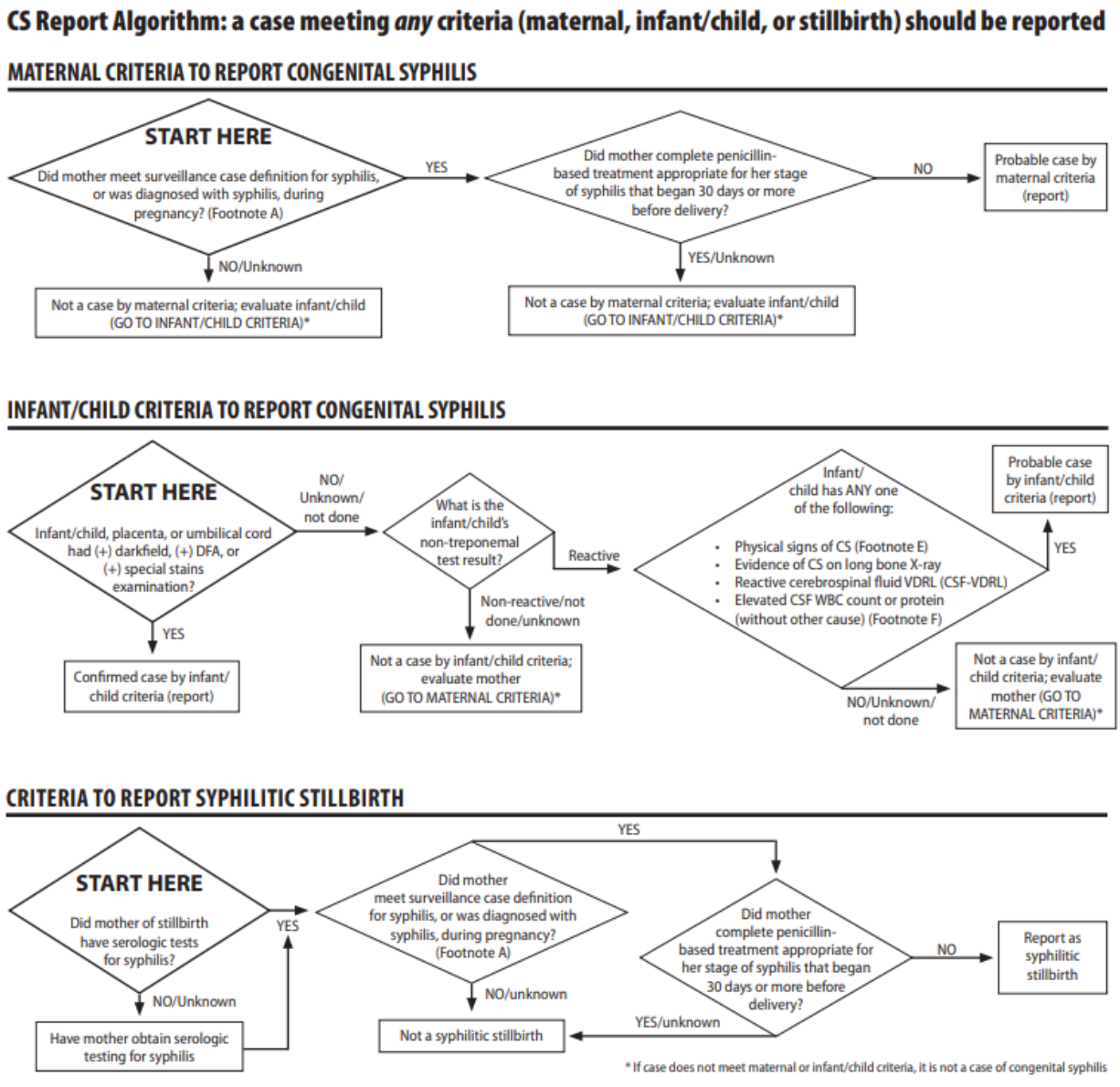
What are your next steps?

A. Report a case of primary syphilis to DPHHS
B. Confirm the case with VDRL/TPPA serology from a blood draw
C. I have no idea, but I'll call Cara or Jessica to find out

GOALS - Syphilis Public Health Case Investigation

- Public Health Urgency (report to MT DPHHS within 24 hours)
- Aggressive follow-up and partner investigation
    - 40% of congenital syphilis cases die
    - HIV coinfection
- Staging is key to appropriate treatment and partner investigation
    - Public health can stage appropriately through application of case definition
- Prompt partner management
- Prevention of new infections

CONGENITAL SYPHILIS REPORTING ALGORITHM



CONGENITAL SYPHILIS

- Case definition
- DPHHS will ask for the following information
    - Maternal testing, signs, and symptoms (past or present)
    - Maternal risk factors
    - Infant medical information (VDRL/RPR, TPPA testing on blood and CSF, evidence of syphilis on x-ray or physical exam, CSF analysis findings)
    - Treatment of syphilis during pregnancy
- DPHHS may ask for testing of suspect cases:
    - Spinal puncture VDRL/TPPA results
    - Serology on older children

    - Placenta pathology results, if performed
    - Cannot use cord blood (may be contaminated with maternal blood)
- CSF VDRL/TPPA are not maternal antibodies as they do not cross the blood/brain barrier

SYPHILITIC STILLBIRTH

Clinical Description

- A fetal death that occurs after a 20-week gestation or in which the fetus weighs greater than 500g and the mother had untreated or inadequately treated* syphilis at delivery.

  *Adequate treatment is defined as completion of a penicillin-based regimen, in accordance with CDC treatment guidelines, appropriate for stage of infection, initiated 30 or more days before delivery.

Comments

- For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis among infants and children as well as syphilitic stillbirths.

CONGENITAL CASE STUDY #1

23-year-old female presents for first appointment of prenatal care at 24 weeks pregnant

- OB screening panel positive for hepatitis C, gonorrhea, RPR positive with a titer of 1:64, TPPA pending.
- Drug screening is positive for methamphetamine

At 25 weeks GA, the patient presents with a fetal demise. The same day the TPPA comes back positive confirming syphilis.

- Deceased infant was edematous without malformation
- No autopsy was performed

1. Are there any missed opportunities here?
2. Is this a congenital syphilis stillbirth?

TREATMENT

WHAT TYPE OF INFECTION ARE YOU DEALING WITH?

For most cases, treatment regimens can be divided into two categories:

- Is it "new" syphilis (less than a year since infection)?
    - Primary
    - Secondary
    - Early Latent
- Is it "old" syphilis (more than a year since infection)?
    - Late Latent
    - Tertiary Syphilis
    - Syphilis of Unknown Duration
- For some cases, you have further considerations to think about:
    - Are there neurologic, otic, or ocular manifestations?
    - Is it congenital syphilis?
    - Is the person pregnant?

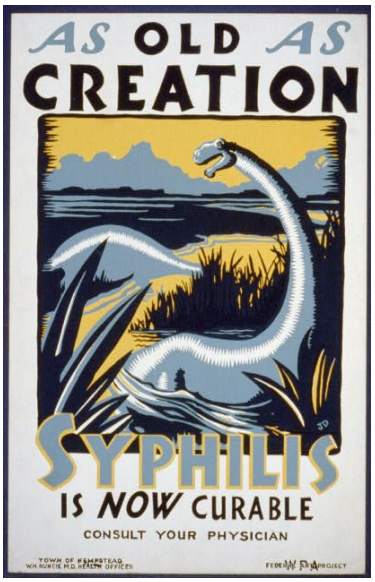
TREATMENT IS A HAVE-TO, NOT A WOULD-LIKE-TO THING TO DO

Administrative Rules of Montana (ARM)

- 37.114.583 SYPHILIS
  The local health officer or the department must either employ or ensure that control measures as outlined in the Centers for Disease Control and Prevention "Sexually Transmitted Diseases Treatment Guidelines, 2015" are followed

NEW SYPHILIS

- Primary, Secondary, or Early Latent (<1 year)
  - Benzathine penicillin G 2.4 million units IM in a single dose (Bicillin LA)
- Does not change with HIV infection present
- If there is a life-threatening allergy (not a fear of needles, nausea, mild rash, or anything that isn't a true allergy), then:
  - Doxycycline 100 mg orally twice daily for 14 days



OLD SYPHILIS

- Late Latent (>1 year), Latent Syphilis of Unknown Duration, or Tertiary Syphilis with Normal CSF Examination
  - Benzathine penicillin G 7.2 million units total, administered as 3 doses of 2.4 million units IM each at 1-week intervals
- If there is a life-threatening allergy (not a fear of needles, nausea, mild rash, or anything that isn't a true allergy), then:
  - Doxycycline 100 mg orally twice daily for 28 days
- Penicillin regimen does not change with HIV infection
- Use caution with doxycycline and HIV infection, not well studied for efficacy

CONGENITAL SYPHILIS

Recommended Regimens

- Aqueous crystalline penicillin G 100,000–150,000 units/kg/day, administered as 50,000 units/kg/dose IV every 12 hours during the first 7 days of life and every 8 hours thereafter for a total of 10 days

OR

- Procaine penicillin G 50,000 units/kg/dose IM in a single daily dose for 10 days

SPECIAL CIRCUMSTANCES

Pregnant Women

- Treat according to stage of syphilis infection
- For women who have primary, secondary, or early latent syphilis, a second dose of benzathine penicillin 2.4 million units IM can be administered 1 week after the initial dose
- Pregnant women with allergies to PCN should be desensitized and treated with Bicillin LA

Follow-Up for Pregnancy

- Sonographic fetal evaluation when diagnosed in second half of pregnancy
- Monitor serologic titers at 28-32 weeks and at delivery
- Women treated for syphilis during the second half of pregnancy are at risk for premature labor and/or fetal distress if the treatment precipitates the Jarisch-Herxheimer reaction
- Missed doses are not acceptable, women who miss any dose of therapy must repeat the full course of therapy

FOLLOW-UP AND EDUCATION

- Jarisch-Herxheimer reaction
    - Temporary clinical phenomenon – Not an allergic reaction
    - Acute febrile reaction w/headache, myalgia, and other symptoms
    - Resolves in 24 hours
    - Most common in primary and secondary syphilis
    - Pregnant patients may need additional monitoring
- Interview for sex partners
- Clinical and serologic evaluation at 6 and 12 months after treatment, but may need to be more frequent for those at risk for reinfection
- Monitor for treatment failure

CONGENITAL CASE STUDY #2

- 28 yo pregnant female presented to initial prenatal care at an estimated 24 weeks gestation. Syphilis screening results are:
    - RPR positive, titer is 1:256
    - TPPA positive
- Syphilis was diagnosed and staged as unknown duration as symptoms were not present and infection cannot be determined if it was less than a year.
- Treatment was ordered as:
    - Aq. PCN G 2.4 million units IVPB x1 dose weekly for three weeks starting at about 25 weeks gestation
- The mother did not receive these doses on a weekly basis and was only given two total.
- The baby was delivered at an estimated 33 weeks.
    - Baby is asymptomatic, positive CSF screening
    - Mom's RPR titer was 1:128 at delivery

1. Was the treatment adequate? Why or why not?
2. Is this congenital syphilis?

CONTROL MEASURES AND REPORTING

Partner Investigation

TO TREAT PRESUMPTIVELY, OR NOT TO TREAT?

For those diagnosed with primary, secondary, or early latent:

- Persons who were exposed within the 90 days preceding the diagnosis syphilis in a sex partner might be infected even if seronegative; therefore, such persons should be treated presumptively for early syphilis, even if serologic test results are negative.
- Persons who were exposed OVER 90 days preceding the diagnosis of syphilis in a sex partner should be treated presumptively if serologic test results are not available immediately and the opportunity for follow-up is uncertain.
- When serologic tests do not correspond with clinical findings suggestive of early syphilis, presumptive treatment is recommended for persons with risk factors for syphilis, and use of other tests (e.g., biopsy and PCR) should be considered.
- Long-term sex partners of persons who have late latent syphilis should be evaluated clinically and serologically for syphilis and treated on the basis of the evaluation's findings.
- Persons who have had sexual contact with a person who receives a diagnosis of primary, secondary, or early latent syphilis >90 days serologic tests are negative, no treatment is needed.

PARTNER INVESTIGATIONS

37.114.583 SYPHILIS

- The local health officer or the department must either employ or ensure that control measures as outlined in the Centers for Disease Control and Prevention "Sexually Transmitted Diseases Treatment Guidelines, 2015" are followed.

Excerpt from 2015 STD Treatment Guidelines:

- The following sex partners of persons with syphilis are considered at risk for infection and should be confidentially notified of the exposure and need for evaluation: partners who have had sexual contact within 1) 3 months plus the duration of symptoms for persons who receive a diagnosis of primary syphilis, 2) 6 months plus duration of symptoms for those with secondary syphilis, and 3) 1 year for persons with early latent syphilis

CHALLENGES WITH PARTNER INVESTIGATIONS

- Try to get a name for each partner
- Attempt to gather exposure information
- Try to get some locating information so they can be contacted
- Attempt to get detailed descriptions of partners
- Partners need to be entered into MIDIS and disposition codes entered when you eventually get the information

HELPFUL REFERENCES FROM MCA

The Montana Code Annotated (MCA) has two helpful laws when performing these investigations:

- 50-2-120 Assistance from law enforcement officials
    - A state or local health officer may request a sheriff, constable, or other peace officer to assist the health officer in carrying out the provisions of this chapter.
- 50-2-122 Obstructing local health officer in the performance of duties unlawful
    - It is unlawful to:

    (1) hinder a local health officer in the performance of duties under this chapter;

    (2) remove or deface any placard or notice posted by the local health officer; or

    (3) violate a quarantine regulation.

REPORT CONTENTS

- Name
- DOB
- Race/Ethnicity
- Physical address
- Zip Code
- Date Diagnosed
- Onset date of symptoms
- Hospitalized or not
- Supplemental Questionnaire
    - Staging questions
    - Exposure dates
    - Signs and symptoms
    - HIV status
    - Areas or platforms where partners are met

CASE STUDY #1

- 39 yo male
- High risk heterosexual
- Lab work confirmed syphilis infection, patient had sore
- Provider treated with bicillin 2.4mu X 1 dose
- Certified letters were sent to 8 partners
- Patient named 14 female partners, 1 known case, 3 tested negative, 1 partner out of state, 6 unable to locate, and 2 partners still pending

Open discussion points:

- Can you stage this infection?
- Was the treatment adequate?
- What resources do you have to find this person for interview?

CASE STUDY #2

- 28 yo female, patient not pregnant
- Provider notified DPHHS while discussing another case
- Lab information, T. pallidum Ab Reactive
- Clinical information, patient reported chancre
- Patient treated with bicillin 2.4mu X 1 dose

Open discussion points:

- Can you stage this infection?
- What resources do you have to find this person for interview?

Resources for Syphilis

- Syphilis Recordings and Documents General 5 — University of Washington STD Prevention Training Center (uwptc.org)
- Quick Reference STD Information and Podcasts National STD Curriculum (uw.edu)
- Request Clinical Consults — University of Washington STD Prevention Training Center (uwptc.org)
- Increased incidence of congenital syphilis and syphilis in Montana women of childbearing age HAN Update 10 - 2021 (mt.gov)
- What Healthcare Providers Can Do What Healthcare Providers Can Do About Syphilis | Syphilis | CDC

QUESTIONS?

Cara Murolo - cmurolo@mt.gov
Jessica Lopeman, MPH, BSN – jessica.lopeman@mt.gov

Syphilis Supplemental Slides for Reference

CDC Syphilis Screening Guidelines	
Pregnant Women	**All pregnant women at the first prenatal visit** **Retest early in the third trimester and at delivery if at high risk**
Men Who have Sex With Men (MSM)	**At least annually for sexually active MSM** **Every 3 to 6 months if at increased risk**
Persons with HIV	**For sexually active individuals, screen at first HIV evaluation, and at least annually thereafter** **More frequent screening might be appropriate depending on individual risk behaviors and the local epidemiology***
***Supplementary Recommendations**	**Persons symptomatic of syphilis infection** **Persons who have partner(s) who have tested positive for syphilis** **Any person with high risk sexual behavior such as multiple concurrent partners, anonymous sex, sex while high or intoxicated and women who have sex with MSM**

SURVEILLANCE

- Perform active surveillance for all reportable illness within your local health jurisdiction
    - Administrative Rules of Montana (ARM) 37.114.203
    - Under ARM 37.114.201, individuals with the knowledge of a reportable condition must immediately report to the local health jurisdiction
    - MIDIS
- CDEpi reviews death certificates for communicable disease related diagnoses
    - When a certificate with syphilis as a cause of death surfaces, it may be a case we are aware of, but it sometimes isn't
    - We may ask the local health jurisdiction to investigate
    - Sometimes there are issues with coding of death diagnoses
    - Death uncommon due to syphilis unless it is a syphilitic stillbirth
        - Fetal death certificates must be filed if the fetus is at or over 350 grams, or if weight is unknown, more than 20 weeks of gestation

REPORTING TIMELINES FOR SYPHILIS

- Immediately reportable to local health jurisdiction (i.e.-within 24 hours) for anyone with knowledge of a syphilis case
    - ARM 37.114.201
- MUST BE REPORTED TO DPHHS WITHIN 24 HOURS
    - ARM 37.114.204
- How to report?
    - MIDIS-Create Notification
    - Phone

STAGING PRIMARY SYPHILIS

Laboratory Criteria:

- Confirmatory
  - Positive darkfield or PCR
- Supportive
  - Positive VDRL/RPR

  OR
  - Positive TPPA/EIA

Clinical Description:

- A stage of infection with *Treponema pallidum* characterized by one or more ulcerative lesions (e.g. chancre), which might differ considerably in clinical appearance.

STAGING SECONDARY SYPHILIS

Laboratory Criteria:

- Confirmatory
  - Positive darkfield or PCR
- Supportive
  - Positive VDRL/RPR

  AND
  - Positive TPPA/EIA

Clinical Description:

- A stage of infection caused by *T. pallidum* characterized by localized or diffuse mucocutaneous lesions (e.g., rash – such as non-pruritic macular, maculopapular, papular, or pustular lesions), often with generalized lymphadenopathy. Other signs can include mucous patches, condyloma lata, and alopecia. The primary ulcerative lesion may still be present

STAGING EARLY, NON-PRIMARY, NON-SECONDARY SYPHILIS (EARLY LATENT SYPHILIS)

Laboratory Criteria:

- Supportive
  - A current RPR/VDRL test titer demonstrating fourfold or greater increase from the last titer, unless there is evidence that this increase was not sustained for >2 weeks.

Clinical Description:

- A stage of infection caused by *T. pallidum* in which initial infection has occurred within the previous 12 months, but there are no signs or symptoms of primary or secondary syphilis.

EARLY NON-PRIMARY, NON-SECONDARY SYPHILIS

PROBABLE Case Classification

A person with no clinical signs or symptoms of primary or secondary syphilis who has one of the following:

- No prior history of syphilis, AND a current reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), AND a current reactive treponemal test (e.g., TP-PA, EIA, CIA, or equivalent serologic methods), OR
- A prior history of syphilis and meets the supportive laboratory criteria.

AND evidence of having acquired the infection within the previous 12 months based on one or more of the following criteria:

- Documented seroconversion or fourfold or greater increase in titer of a nontreponemal test during the previous 12 months, unless there is evidence that this increase was not sustained for >2 weeks
- Documented seroconversion of a treponemal test during the previous 12 months
- A history of symptoms consistent with primary or secondary syphilis during the previous 12 months

- Meets epidemiologic criteria

Epidemiological Criteria:

- A history of sexual exposure to a partner within the previous 12 months who had primary, secondary, or early non-primary non-secondary syphilis (documented independently as duration <12 months).
- Only sexual contact (sexual debut) was within the previous 12 months.

SYPHILIS, UNKNOWN DURATION OR LATE

Clinical Description

- A stage of infection caused by *T. pallidum* in which initial infection has occurred >12 months previously or in which there is insufficient evidence to conclude that infection was acquired during the previous 12 months.

PROBABLE Case Classification

A person with no clinical signs or symptoms of primary or secondary syphilis who meets one of the following sets of criteria:

- No prior history of syphilis, and a current reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), and a current reactive treponemal test (e.g., TP-PA, EIA, CIA, or equivalent serologic methods), OR
- A prior history of syphilis, and a current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer, unless there is evidence that this increase
- was not sustained for >2 weeks, OR
- Clinical signs or symptoms and laboratory results that meet the likely or verified criteria for
- neurologic, ocular, otic, or late clinical manifestations syphilis (see below)

AND who has no evidence of having acquired the disease within the preceding 12 months (see Syphilis, early non-primary non-secondary)

Module 3

Running Reports in MIDIS

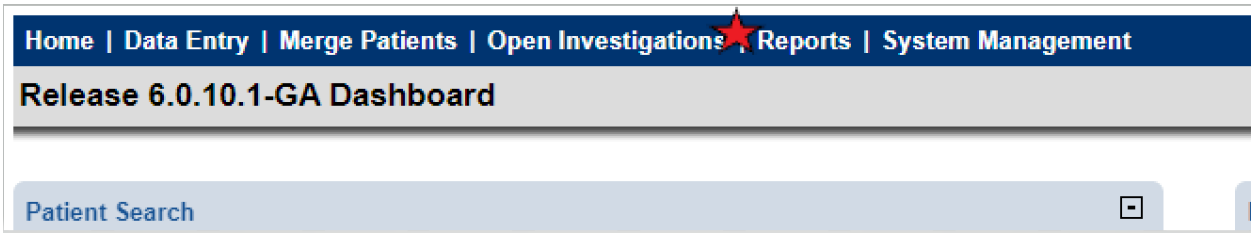
Danny Power, MPH, MPA

Overview

- Navigating the Reports Page
- Customizing a Report
- Creating a New Report
- Sharing Reports
- Common Errors and DPHHS Support

Start at the Beginning: Where to Find Reports

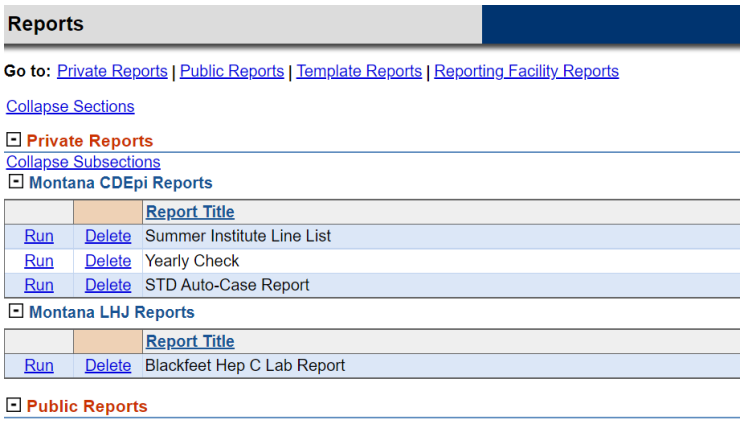
- Log into MIDIS
- Navigate to the Reports Tab



4 Basic Sections

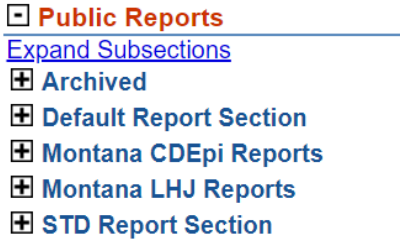
Majority of useful reports will be in Public and Template

1. Private Reports
   - These are reports that you have created, personalized, and saved to your MIDIS account
   - **No one else can access these reports**
   - We will touch on how to "share" these reports later



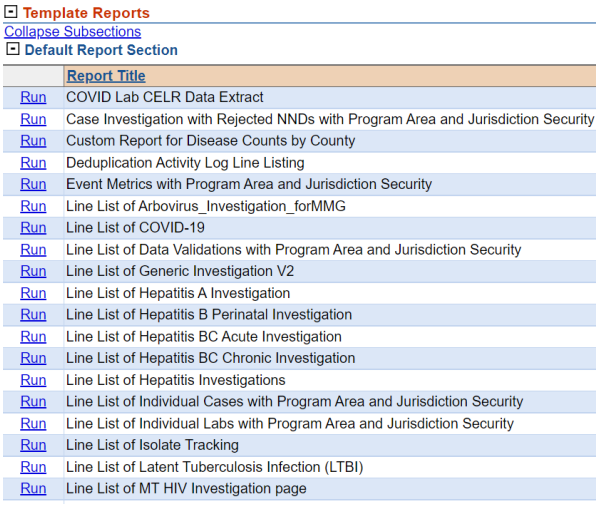
2. Public Reports

- Default: These are reports created by programmers, and where your report will save if you don't change the location you want to save it at
- MT CDEpi: These are reports built and personalized by our CDEpi team, feel free to use them, customize them, and save them for your own purposes!
- MT LHJ: Reports that LHJs have made and saved in the system for public use
- STD Report: Reports made by the STD team mainly for grant data and analysis

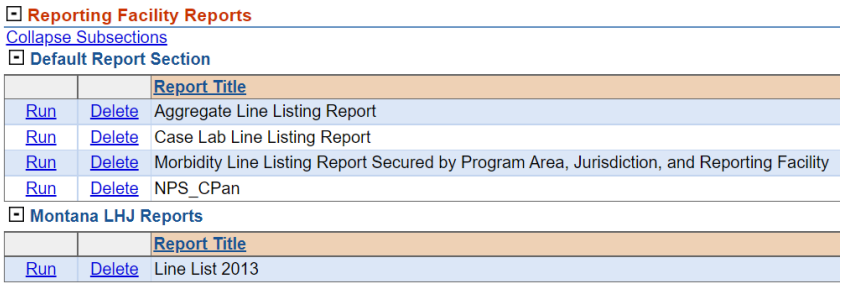


3. Template Reports

- Great place to start building/customizing your own reports
- Again broken down into default and CDEpi reports



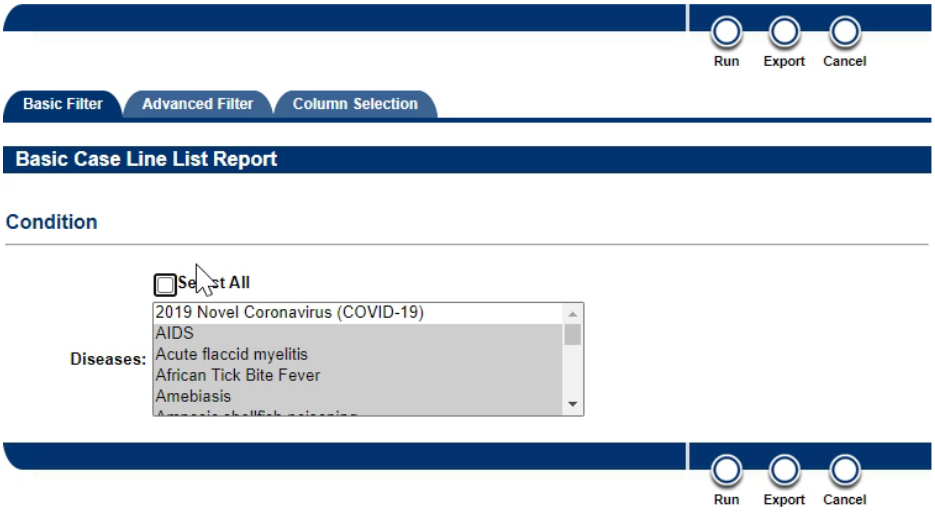
4. Reporting Facility Reports
   - A few various reports that don't get used much, but if you find a way that they can be useful to you, then feel free to use them!
   - Majority found in Template or Public Reports



Customizing a Report

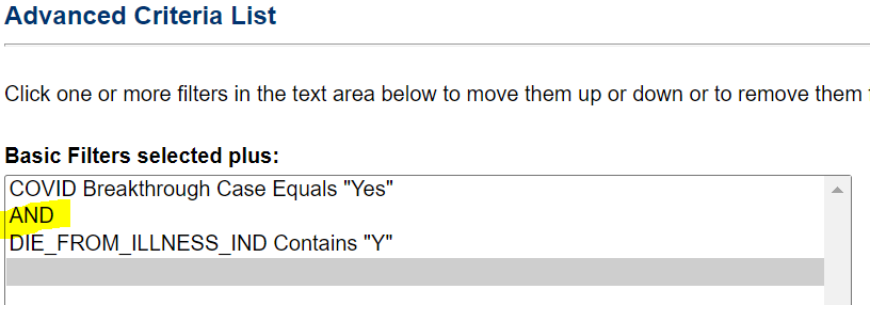
Basic Filter

The Basic Filter will be a very straightforward way to narrow your report, usually by date range, but sometimes by condition.



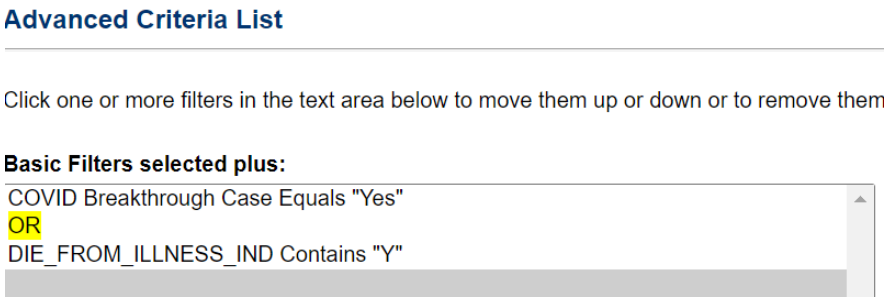
AND/OR Logic

- Be VERY Careful with your and/or logic, make sure it is pulling what you want it to!
- This will give me only those COVID cases reported as both breakthrough infections and deaths

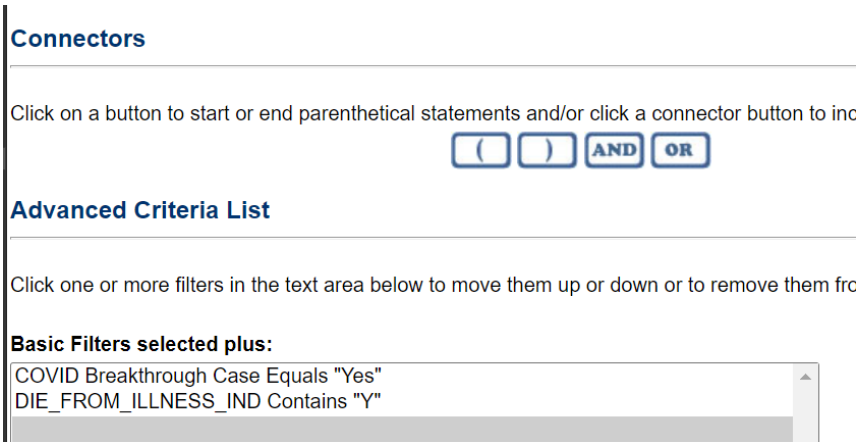


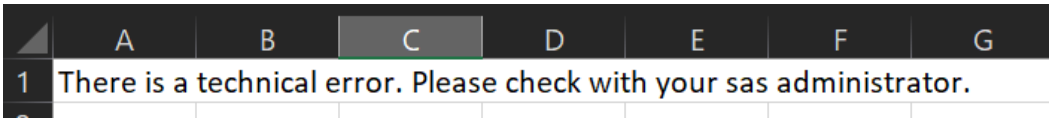
This will give me two different sets of cases:

- All Breakthrough Cases
- All Cases marked as COVID Deaths
- Will not relate the two columns to each other



Be sure that you have logic built in. If none is present, you will get an error in your export





Advanced Filter

Allows you to pare down by specific column values using logic sets

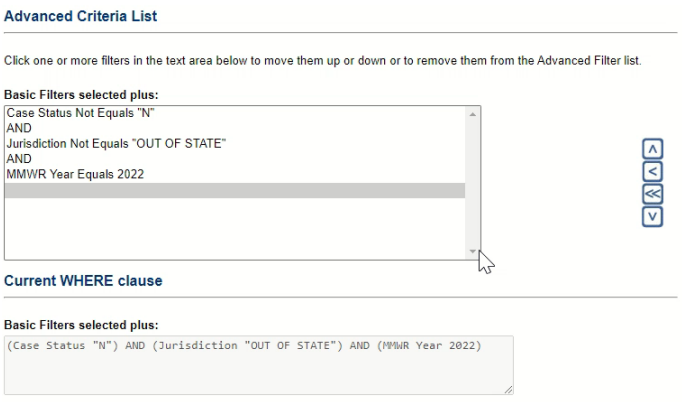
(,), AND, OR buttons insert into the List

^ Move up in the List

< Delete Line

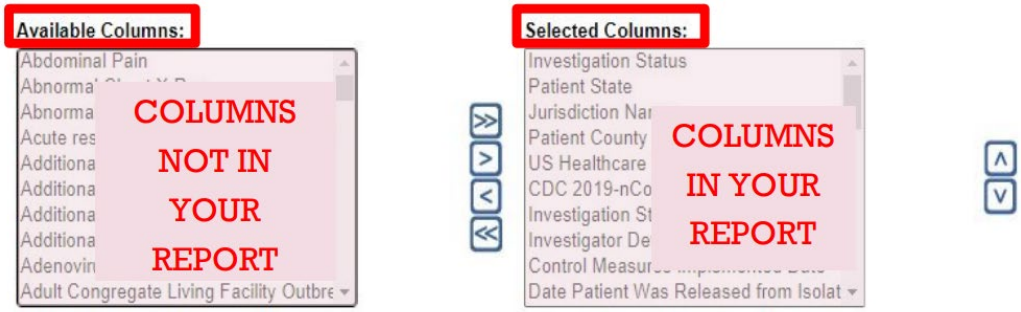
<< Delete All Filters

v Move Down in List

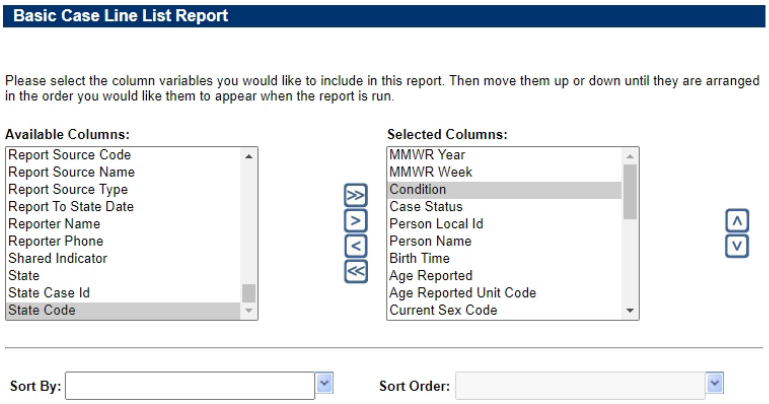


Column Selection

Allows you to choose what columns matter to you. Available Columns is the columns you can add, selected are the ones in the report by default

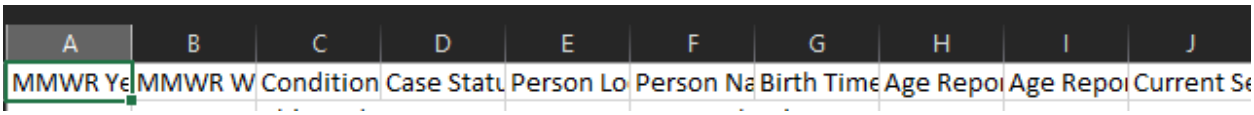


- << Moves everything out of Selected Columns
- >> Moves everything into Selected Columns



Rearranging Your Columns

Moving Your Selected Columns Up and Down will rearrange the order in your Final Report, allowing you to customize for how the information work best for you

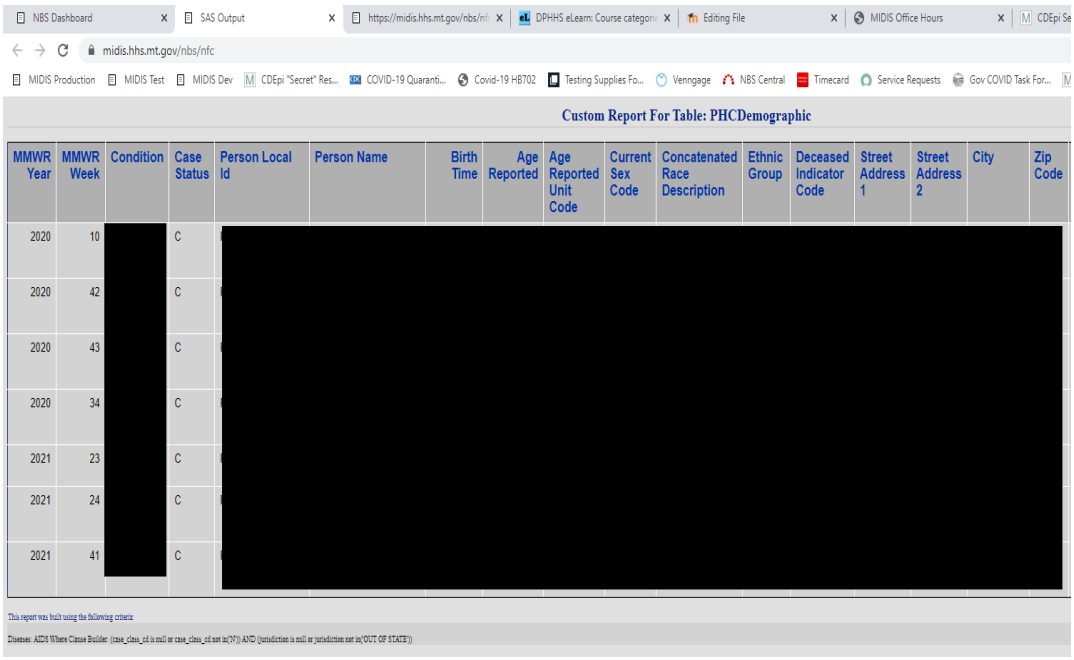


Running a Report

- Three Basic Options

Run

- Opens your report in a new tab in the web browser in an HTML format
- Tells you your Criteria at the bottom
- Make sure you turn-off your pop-up blocker



Export

- Generates a CSV file for you to download and save to your files
- Added bonus of all of the sorting and table-making functionalities that come along with Excel
- Can handle a larger file size, if you are having issues with your file size being too large for the "Run" option, try Export instead

Cancel

- Very straightforward, hitting this button takes you back to the Reports Main Page and tosses out any unsaved changes

Saving a Report

Know Your Options

- If you hit Export and then leave the page you cannot save!
- Select Run and then save as a new report!
- Once you have "Run" the report and saved it as new, then you can use the export feature

Saving Your Custom Report

- If you only hit "Save" it will overwrite the report
- Hit "Save as New" to create a new report
- Save it as Private if it is just for you, or Public if you want to share it with other users/jurisdictions
- When Naming or Describing the Report be specific so that you and others can know what it is doing

How to Share a Private Report

I have a great report that I want others to use, but I don't want EVERYONE to see it…

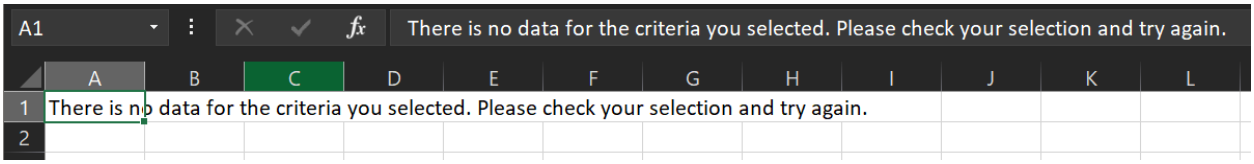
- Open the Report in Question and "Run" it
- Now "Save As New" and make sure it gets saved as a Public Report
- Have the Individual you want to share the report with go into the Public version, "Run" it and "Save As New" as their own Private Report
- The original user can then go in and delete the Public Report (make sure you have a Private version still before doing this)

- Voila! Now you have multiple identical private reports, this is helpful in case someone has good private reports but is leaving your department

Restrictions Around Reports

- Reports are Jurisdiction and Program Area "blocked", they will only pull out information that you have access to in MIDIS
- Bonus of this is that if you save an LHJ specific report publicly, it won't let other LHJs see PHI that they shouldn't
- Reports get updated every night when the system goes down, will never include things that have been added today. So if you update something in the system, you will have to wait until the next day for it to be reflected in your reports.

Common Errors



- The most common error we see is "No Data" if you get this, you'll want to make sure that your filters aren't too restrictive, that you have columns selected, and that your Basic Filter makes sense
- The other error we've seen in the past is "dataset too large", with the MIDIS upgrade I upped the amount of data you can pull into an export, but the run option is still somewhat low, if you run a report and get this error, try exporting instead

DPHHS Support

When in Doubt, Reach out!

- If you are having trouble getting a report to run or don't know where to start, send me an email or give me a call.
- We can figure out if there is a Template report already built that can get you the data you need, or I can help you build something new!

THANKS!

Any questions?

danny.power@mt.gov
406-329-5434

The Wonderful World of Infection Control and Prevention

Samantha Carle, Elizabeth Adams, Dianna Bowling, Andrea Woody

Questions!

How many of you feel like your knowledge of infection control and prevention has increased over the past two years due to the COVID-19 pandemic?

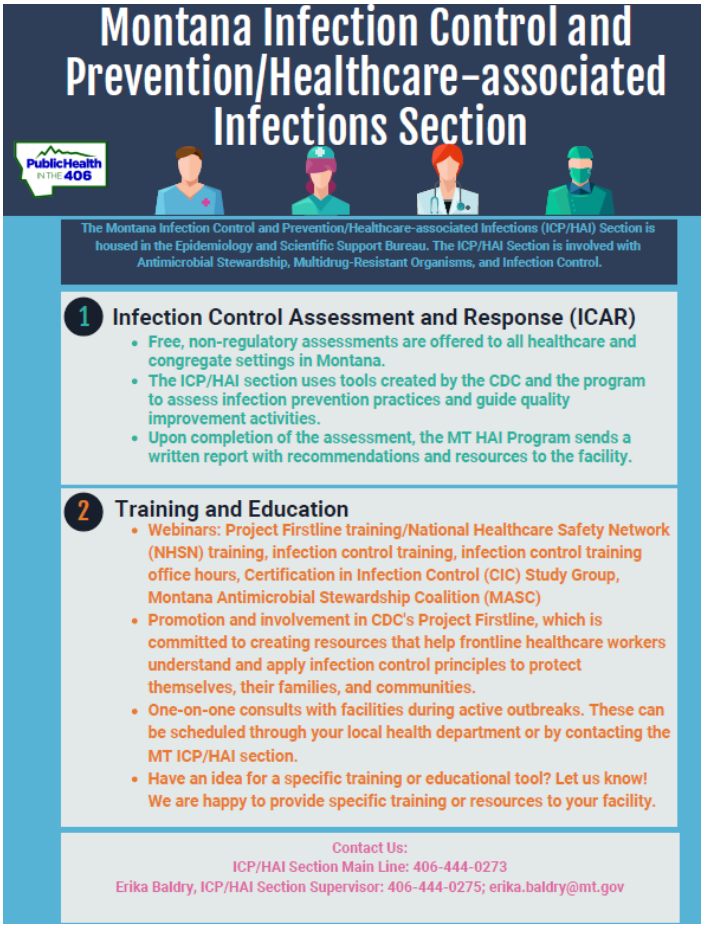
- Room Attendees: Raise your hands
- Virtual: Please select the "raise your hand" function

How many of you know that we have an Infection Control and Prevention/Healthcare Associated Infections Section at MT DPHHS?

- Room Attendees: Raise your hands
- Virtual: Please select the "raise your hand" function

ICP/HAI Section

- ICP/HAI= Infection Control and Prevention/Healthcare-associated Infection Section
- Non-regulatory section
- Offer free, non-regulatory infection control assessments (ICARs)
- Provide infection control consults during active outbreaks (not just COVID!)
- Educational trainings (both formal and as requested)
- Provide resources and education related to antimicrobial stewardship (AMS)



Meet the Team

Public Health's Role

- Outbreak response to communicable diseases
- Congregate Living Coordinator
- MIDIS investigations
- Provide guidance for outbreak response and mitigation strategies
    - Some of these mitigation strategies are infection control related
- Check-in with your key surveillance partners on a routine basis

Key Surveillance Partner Examples

- Assisted Living Facilities
- Skilled Nursing Facilities
- Acute Care Hospitals
- Outpatient Healthcare Facilities
- Group Homes
- Daycares
- Schools
- Jails

Healthcare Setting Definition

- Healthcare settings refers to places where healthcare is delivered and includes, but is not limited to, acute care facilities, long-term acute-care facilities, inpatient rehabilitation facilities, nursing homes, home healthcare, vehicles where healthcare is delivered (e.g., mobile clinics), and outpatient facilities, such as dialysis centers, physician offices, dental offices, and others.

Activity

- We will split tables into 3 groups
- Please start at your assigned IP station
- We will switch stations every 10 minutes!
- At 9:40 am, we will put what you learn to practice

Exercise

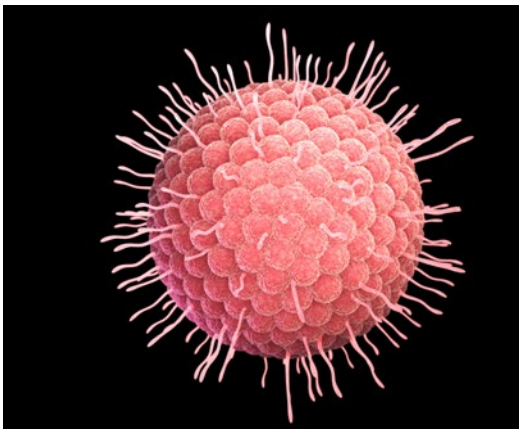
- In-Person Attendees:
    - Fill out the activity sheet with individuals at your table
    - When you finish, raise your hand
- Virtual Attendees:
    - Fill out the activity sheet with individuals on chat
    - When you finish, select the "raise your hand" function
- Someone from the IP team will check your answers
- First team to **correctly** finish the worksheet will be the IP winner!

Vaccine Preventable Diseases

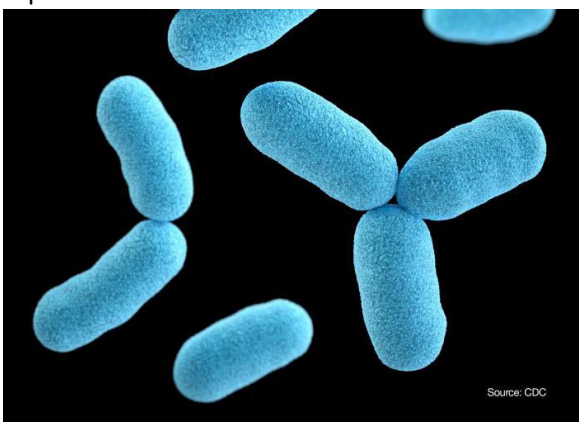
Jessica Lopeman, MPH, BSN, RN-BC, a-IPC

Which VPDs will be discussed?

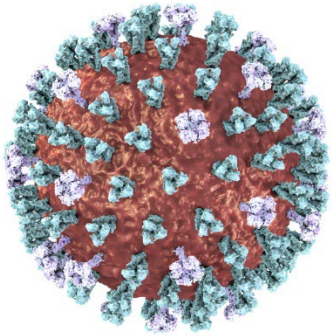
Varicella Zoster Virus



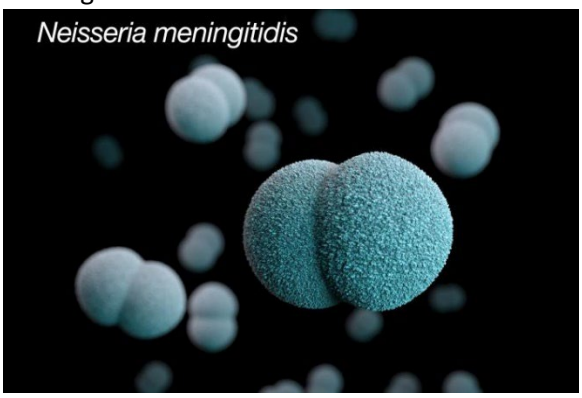
Diphtheria



Measles



Meningococcal



Varicella Zoster Virus

A Tale of Two Illnesses

History of Varicella

- 1875 – Rudolf Steiner – inoculated volunteers with fluid from ill patient – differentiated from smallpox
- 1954 – Thomas Weller – Isolated the virus in cell culture from vesicular fluid of patients with varicella or zoster
- Vaccine developed 1970s in Japan
- Most children had chicken pox by age 10 before the vaccine was available

Varicella Zoster Virus (VZV)

- Primary infection is Varicella or Chickenpox
- Retreats to nerve ganglia, going latent.
- Reactivation infection is Herpes Zoster or Shingles
- Enters the body via the respiratory tract and the conjunctiva
- Incubation period = 14-16 days following exposure
    - Range 10-21 days
- May be prolonged (28 days +) in persons who received Varicella immune globulin

Primary Infection – Varicella/Chickenpox

- Mild prodrome – fever, malaise, headache
- Generalized rash, pruritic, progresses rapidly
    - STARTS on the TRUNK, then moves out
- Starts macular-papule > vesicles > dry out and crust
- Several successive crops
    - 2-4 crops with 250-500 lesions
- Usually results in lifelong immunity
- Adults may have more severe disease
- Vaccinated individuals will have less lesions which may not crust
- Complications include secondary skin infections, pneumonia, aseptic meningitis, encephalitis
- and Reyes syndrome

Congenital VZV Infection

- Varicella in Mother during first half of pregnancy
- Can cause fetal abnormalities
    - "Congenital Varicella Syndrome"

Varicella Laboratory Testing

- PCR is preferred method
- Available at state public health lab for FREE
    - Part of ENHANCED surveillance for Varicella
- Skin lesion is the preferred sample for testing
    - Vesicular lesion swab in Universal Viral Transport media
    - Transport at 2-8^{o}C
    - Turnaround is 1-3 working days

Varicella Vaccination

- Two vaccines available
    - VAR – varicella only
    - MMRV – Measles, mumps, rubella, varicella
- 2-dose series
    - 1st dose 12-15 months
    - 2nd dose 4-6 years
- Vaccine Effectiveness
    - 1 dose = 82%

    - 2 doses = 92%
- 2 doses are required for school in Montana

Varicella in School or Daycare Settings

- Confirm the diagnosis
- Identify school close contacts without evidence of immunity
    - Same classroom, extracurriculars, lunch tables
- Notification letter to Parents
- Exclusion of non-immune persons
    - Children without age-appropriate vaccination history
    - Adults without 2 doses or history of illness
- Exclude for 21 days following last exposure
- May return immediately following a dose of varicella vaccine (1st or 2nd dose)
- Persons with illness may return after ALL lesions have crusted over
- Vaccinated ill persons may return 24 hour after the last lesion appeared

Varicella Case Definitions

Clinical Description:

- An illness with acute onset of diffuse (generalized) maculo-papulovesicular rash without other apparent cause.

Laboratory Criteria for Diagnosis:

- Isolation of varicella virus from a clinical specimen, OR
- Varicella antigen detected by direct fluorescent antibody test, OR
- Varicella-specific nucleic acid detected by polymerase chain reaction (PCR), OR
- Significant rise in serum anti-varicella immunoglobulin G (IgG) antibody level by any standard serologic assay.

PROBABLE

- An acute illness with
    - Diffuse (generalized) maculo-papulovesicular rash, AND
    - Lack of laboratory confirmation, AND
    - Lack of epidemiologic linkage to another probable or confirmed case.

CONFIRMED

- An acute illness with diffuse (generalized) maculo-papulovesicular rash, AND
- Epidemiologic linkage to another probable or confirmed case, OR
- Laboratory confirmation by any of the following:
    - Isolation of varicella virus from a clinical specimen, OR
    - Varicella antigen detected by direct fluorescent antibody test, OR
    - Varicella-specific nucleic acid detected by polymerase chain reaction (PCR), OR
    - Significant rise in serum anti-varicella immunoglobulin G (IgG) antibody level by any standard serologic assay.

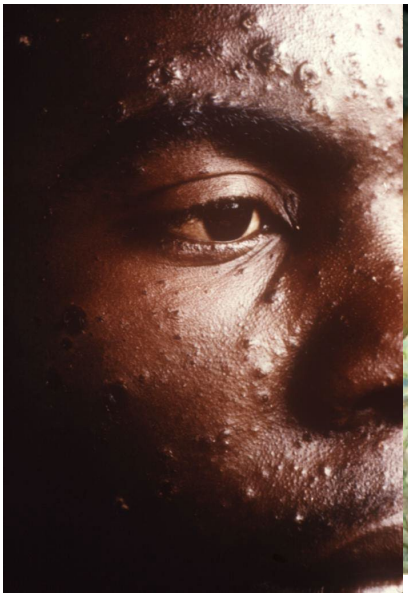
Considerations

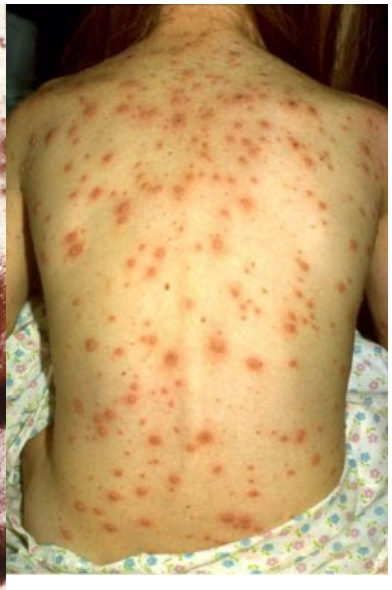
- Two probable cases that are epidemiologically linked would be considered confirmed, even in the absence of laboratory confirmation.
- Both probable and confirmed cases require clinical description of illness. This MUST be part of your case investigation in MIDIS.
- IgG labs in MIDIS might be healthcare worker pre-employment screening and are NOT reportable

So, What About Shingles?

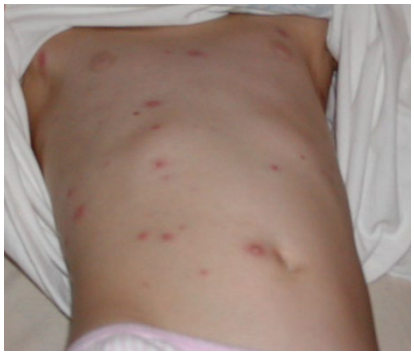
- Shingles is NOT a reportable condition in Montana.
- When you get a lab report for VZV, please contact the ordering provider to ascertain if this is a case of varicella or shingles.
- There are clues about which illness it may be – primarily AGE
- If you start a case investigation and find out that it's not a case of varicella, change the case status to "Not a Case"

Varicella Rash Pictures (CDC)





Left and center picture are the varicella rash in unvaccinated individuals. Right picture is varicella rash in a vaccinated individual.



Measles

Not All Rashes are Measles

History of Measles

- 7th century is the first mention of measles
    - Described by Persian physician Rhazes in 10th century as "more to be dreaded than smallpox"
- First vaccine (Edmonston B strain) licensed in US in 1963

    - Combo MMR in 1971, MMRV in 2005
- Most children were immune through infection by age 15
- Still common in developing countries, can be fatal
    - WHO estimates 142,300 deaths in 2018 from measles
- Officially declared eradicated in the US in 2000 by WHO

Measles Virus

- Airborne transmission through respiratory droplets
- Highly contagious – 90% of unvaccinated, exposed persons will get measles
- Transmissible 4 days prior and 4 days after rash appearance
- Incubation period = 11-12 days
    - Average is 14 days
    - Range of 7-21 days
- Prodrome of 2-4 days – fever, cough, coryza, conjunctivitis
    - Koplik spots
- Rash begins at hairline and moves down the body
- Complications include diarrhea, otitis media, pneumonia, encephalitis, sub acute panencephalitis (SSPE), death
    - More likely in kids under 5 and adults
    - Can occur in ~ 30% of cases
- Measles can affect immunity from previous vaccinations

Measles Laboratory Testing

- PCR is preferred method
- Throat, nasopharyngeal or nasal Dacron swab in viral transport media
- Transport temperature:
    - 2-8° C within 24 hours OR
    - Freeze at -70° C and transport on dry ice
- Turn-around Time: 1 to 2 working days

Measles Vaccination

- Two vaccines available
    - MMR – Measles, mumps, and rubella
    - MMRV – with varicella
- 2-dose series
    - 1st dose 12-15 months
    - 2nd dose 4-6 years
- Vaccine Effectiveness
    - 1 dose = 93%
    - 2 doses = 97%
- 2 doses are required for school in Montana

Measles in School or Daycare Settings

- Confirm the diagnosis

- Identify school close contacts without evidence of immunity
    - Same classroom, extracurriculars, lunch tables
- Notification letter to Parents
- Exclusion of non-immune persons
    - Children without age-appropriate vaccination history
    - Adults without 2 doses or history of illness
- Exclude for 21 days following last exposure
- **Some** may return following a dose of measles vaccine within 72 hours of exposure
- Persons with illness may return day 5 after rash appearance

Other Measles Exposures

- Vaccinate non-immune household members
    - Don't wait for testing to result!
- Non-immune pregnant persons, infants < 1 year, and severely immunocompromised persons should receive IG within 6 days of exposure
- Ill persons should isolate for 4 day after rash appearance
    - Can return to work or school on day 5 after rash start

Measles Case Definitions

Clinical Description:

- An acute illness characterized by:
    - Generalized, maculopapular rash lasting ≥3 days; and
    - Temperature ≥101°F or 38.3°C; and
    - Cough, coryza, or conjunctivitis.

PROBABLE

- In the absence of a more likely diagnosis, an illness that meets the clinical description with:
    - No epidemiologic linkage to a laboratory-confirmed measles case; and
    - Noncontributory or no measles laboratory testing.

CONFIRMED

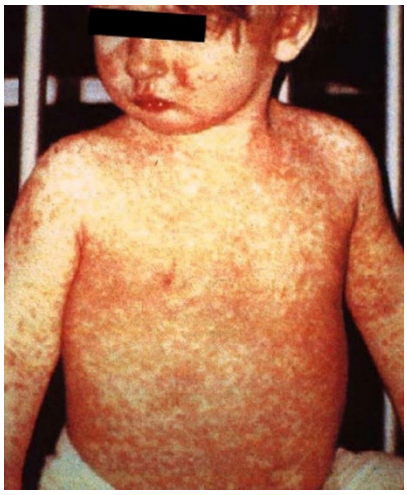
- An acute febrile rash illness with:
    - Isolation of measles virus from a clinical specimen; OR
    - Detection of measles-virus specific nucleic acid from a clinical specimen using polymerase chain reaction; OR
    - IgG seroconversion or a significant rise in measles immunoglobulin G antibody using any evaluated and validated method; OR
    - A positive serologic test for measles immunoglobulin M antibody; OR
    - Direct epidemiologic linkage to a case confirmed by one of the methods above.

Epidemiologic Classification

- Internationally imported case
- US-acquired case

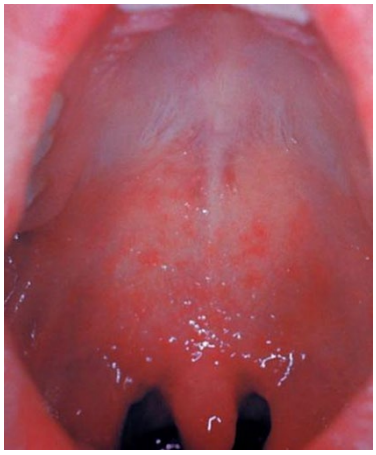
- Import-linked case
- Imported-virus case
- Endemic case
- Unknown source case

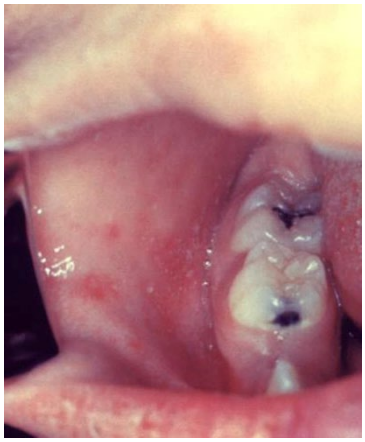
Measles Pictures (CDC)



The two pictures to the left show the measles rash in children. Notice the lighter rash color on darker-pigmented skin.

The two pictures to the right show Kolpik's spots on the mucus membranes. These usually show up during the prodrome of symptoms, before rash onset.





Diphtheria

Sled Dogs to the Rescue

History of Diphtheria

- Greek word meaning "leather hide"
- Described by Hippocrates in 5th century BCE
  - Epidemics described by Aetius in 6th century AD
- Diphtheria toxoid developed in early 1920s, widely used at beginning of 1930s

- Added to tetanus toxoid and pertussis vaccine in 1940s

Corynebacterium diphtheriae

- A bacteria that may produce toxins (tox gene)
    - Toxin stops cellular protein synthesis, destroys nearby tissues, and forms a PSEUDOMEMBRANE
- Classified by site of infection: respiratory and cutaneous
    - Most common sites are pharynx and tonsils
- Transmission is generally respiratory droplets, but can also be exposure to infected skin lesions or items soiled with discharge
- Incubation period = 2-5 days
    - Range 1-10 days
- May involve any mucus membrane
- Onset is gradual
    - First symptoms are sore throat, anorexia, malaise, low-grade fever
- Bluish-white membrane that progresses (pseudomembrane)
    - Adherent to tissues, will bleed when removed, can progress to cover airway causing respiratory distress
- Severe cases will develop “bull neck” from edema
    - Related to amount of local disease in neck and jaw
- Complications are related to toxin production and include myocarditis and neuritis
    - Also, respiratory insufficiency from airway obstruction (esp. in infants)
- Death occurs in 5%-10% of cases

Diphtheria Laboratory Testing

- Testing coordinated by state public health lab
- Bacterial culture
- If positive, sent for testing for tox gene
- Throat, nasal, and wound swabs, pseudo-membrane, or sputum
- Please call CD Epi to initiate testing

Diphtheria Vaccination

- Multiple vaccines are available in US
    - DT
    - DTaP
    - Td
    - DTaP (+/- HepB, IPV, Hib)
- Children get multiple doses through age 12
- Adults should get a booster every 10 years

Diphtheria Treatment

- Severely ill patients will require hospitalization
- Antibiotics and Antitoxin
    - Antitoxin comes from the CDC

    - Requires a consult with CDEpi
- Last case of toxigenic diphtheria in US was in 1997
- Immunity is not usually conferred from illness
    - Need to vaccinate after recovery

Diphtheria Case Definitions

Clinical Criteria:

- Upper respiratory tract illness with an adherent membrane of the nose, pharynx, tonsils, or larynx OR
- Infection of a non-respiratory anatomical site (e.g., skin, wound, conjunctiva, ear, genital mucosa)

Laboratory Criteria for Diagnosis:

- Confirmatory laboratory evidence:
    - Isolation of C. diphtheriae from any site AND
    - Confirmation of toxin-production by Elek test or by another validated test capable of confirming toxin-production
- Supportive laboratory evidence:
    - Histopathologic diagnosis

SUSPECT

- In the absence of a more likely diagnosis, an upper respiratory tract illness with each of the following:
    - an adherent membrane of the nose, pharynx, tonsils, or larynx AND
    - absence of laboratory confirmation AND
    - lack of epidemiologic linkage to a laboratory-confirmed case of diphtheria.

OR

- Histopathologic diagnosis

CONFIRMED

- An upper respiratory tract illness with an adherent membrane of the nose, pharynx, tonsils, or larynx and any of the following:
    - isolation of toxin-producing Corynebacterium diphtheriae from the nose or throat OR
    - epidemiologic linkage to a laboratory-confirmed case of diphtheria.

OR

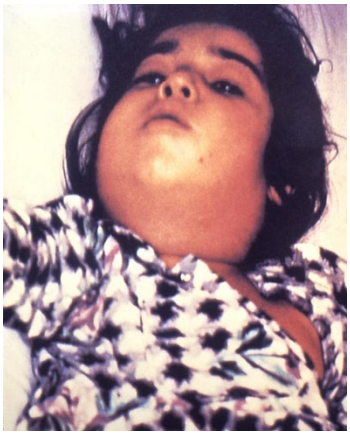
- An infection at a non-respiratory anatomical site (e.g., skin, wound, conjunctiva, ear, genital mucosa) with
    - isolation of toxin-producing C. diphtheriae from that site

Considerations

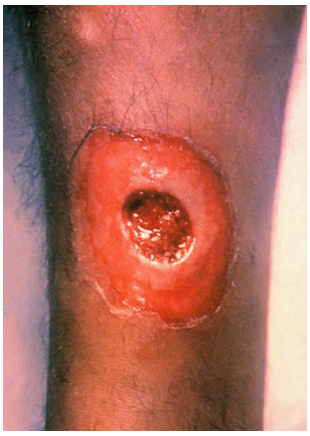
- There hasn't been a case of toxigenic diphtheria since 1997.

- There is no Probable case definition.
- Confirmed cases must have been tested at CDC
    - Only place that can confirm toxin-production

Diphtheria Pictures (CDC)



The picture on the left shows the "bull neck" in a child with diphtheria. The picture on the right shows cutaneous diphtheria. This lesion is not painful.



1925 Serum Run

BALTO and musher Gunnar Kaasen

- January 1925 – Nome, Alaska
    - Deadly diphtheria epidemic
    - Serum in Anchorage, Alaska
- 674-mile journey in 5.5 days
    - 20 mushers and 150 sled dog relay
    - Kept official death toll to 5-7 children
    - 2/3 of the distance was covered by Native Alaskan mushers
- Increase in vaccination following publicity

Meningococcal Disease

Today's Menu: Alphabet Soup

History of Meningococcal

- 1805 - First recorded outbreak in Geneva
- 1891 – Heinrich Quincke used lumbar puncture to analyze cerebrospinal fluid (CSF)
- "Meningitis Belt" is an area of sub-Saharan Africa from Senegal to Ethiopia that is prone to major epidemics of meningococcal meningitis
- Leading cause of meningitis and sepsis in US, can also cause pneumonia and focal disease

Neisseria meningitidis

- Enters the body via the nose and mouth (respiratory droplets or secretions)
- Incubation period = 3-4 days
    - Range 1-10 days
- ~ 50% of cases of invasive meningococcal disease present as meningitis
    - Sudden onset fever, headache, stiff neck, photophobia, altered mental status
- ~30% cases of invasive disease present as septicemia
    - Abrupt onset fever, chills, cold hand/feet, severe aches/pain, vomiting, diarrhea, rash
- Risk factors for invasive disease
    - HIV, absent spleen, immunodeficiency, travel to a hyperendemic or epidemic country, exposure during an outbreak, household crowding, smoking, preceding viral upper respiratory infection

Meningococcal disease

- Death occurs in 10%-15% of cases
- ~20% of survivors will have permanent aftereffects
    - Hearing loss, neurologic damage, loss of limb
- Disease has three peak age groups
    - Highest incidence in infants <1 year, then children 1-4 years of age
    - Young adults 17-21 years of age (college)
    - Adults older than 85 years

Meningococcal

- 12 serogroups
    - Nearly all reports invasive cases involve 6 serogroups
    - A, B, C, W, X, Y
- Serogroups B and C are each 25%-40% of cases
- B is responsible for ~60% of disease in those under 24 years
    - College students are more than 3x the risk
- C, W, and Y are responsible for ~60% of cases in persons 24 years or older
- Only 5% of cases are part of outbreaks

Meningococcal Laboratory Testing

- Looking for Neisseria meningitidis
- Primary specimen or pure culture isolate on chocolate media
- Transport temperature: Ambient
- Turn-around Time: 2-4 working days
- Serogrouping will be performed on positive specimens

Meningococcal Vaccination

- 2 types
    - Quadrivalent meningococcal conjugate (ACWY)
    - Serogroup B meningococcal (B only)

- Increased risk groups have alternative recommendations for vaccination

Meningococcal Case Definitions

Clinical Description:

- Clinical purpura fulminans in the absence of a positive blood culture.

Laboratory Criteria for Diagnosis:

- Gram-negative diplococci, not yet identified, isolated from a normally sterile body site (e.g., blood or CSF)
- Detection of N. meningitidis antigen
    - In formulin-fixed tissue by immunohistochemistry (IHC); OR
    - In CSF by latex agglutination
- Detection of N. meningitidis-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood or CSF), using a validated polymerase chain reaction (PCR) assay; OR
- Isolation of N. meningitidis
    - From a normally sterile body site (e.g., blood or CSF, or less commonly, synovial, pleural, or pericardial fluid); OR
    - From purpuric lesions

SUSPECT

- Clinical purpura fulminans in the absence of a positive blood culture; OR
- Gram-negative diplococci, not yet identified, isolated from a normally sterile body site (e.g., blood or CSF)

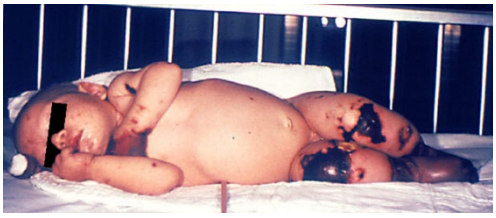
PROBABLE

- Detection of N. meningitidis antigen
    - In formulin-fixed tissue by immunohistochemistry (IHC); or
    - In CSF by latex agglutination

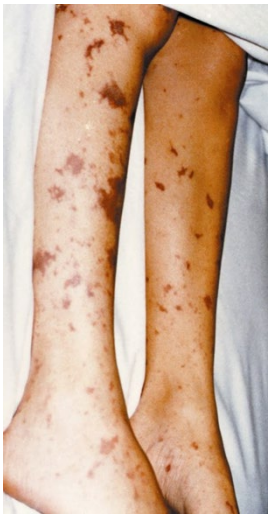
CONFIRMED

- Detection of N. meningitidis-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood or CSF), using a validated polymerase chain reaction (PCR) assay; OR
- Isolation of N. meningitidis
    - From a normally sterile body site (e.g., blood or CSF, or less commonly, synovial, pleural, or pericardial fluid); OR
    - From purpuric lesions.

Meningococcal Disease Pictures (CDC)



These are pictures of the rash that accompanies other symptoms of meningococcal disease. Notice how black the feet are of the child on the left.



Time to Test Your Knowledge

1) True or False - All positive VZV labs are a case of varicella/chicken pox.

2) A pediatric provider calls you and says their patient has measles. The child is 6 years old and recently accompanied her parents to a county that is endemic with measles. Her symptoms started 4 days ago with a fever, runny nose, and redness in her eyes. Today her parents noticed some spots on her face which has spread down to her neck and chest. Assuming this is measles, how long should she be isolated/excluded from school?

3) When was the last case of toxigenic diphtheria in the US?

4) Which serogroup of Meningococcal disease are college students most at risk for?

Group A, Group B, OR Group Y

My Favorite Resources

- Case Definitions - https://ndc.services.cdc.gov/
- Normally Sterile Site - https://www.health.state.mn.us/diseases/invbacterial/sterile.html
- Pink Book - https://www.cdc.gov/vaccines/pubs/pinkbook/index.html
- Varicella Outbreak Manual - https://www.cdc.gov/chickenpox/outbreaks/manual.html

References

https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/varicella.pdf

https://www.cdc.gov/vaccines/pubs/surv-manual/chpt17-varicella.html

https://www.cdc.gov/chickenpox/outbreaks/manual.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fchickenpox%2Foutbreaks%2Fcontrol-investigation.html

https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/meas.pdf

https://www.cdc.gov/vaccines/vpd/measles/index.html#:~:text=Two%20doses%20of%20MMR%20vaccine%20are%20about%2097%25%20effective%20at,through%2012%20years%20of%20age.

https://www.cdc.gov/vaccines/pubs/surv-manual/chpt07-measles.html

https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/dip.pdf

https://en.wikipedia.org/wiki/Balto

https://en.wikipedia.org/wiki/1925_serum_run_to_Nome

https://dphhs.mt.gov/assets/publichealth/Lab/PublicHealthLabTesting/PHLLabManual.pdf

https://www.who.int/publications/i/item/WHO-HSE-PED-CED-14.5

Answers to Test Your Knowledge

1) FALSE – Some may be shingles. You need to contact the ordering provider to see if this is **varicella** or **shingles**. If it is varicella, make sure to ask about the patient's symptoms. You'll need them for the case investigation!

2) The child should remain isolated until day 5 after rash appearance. This includes school and community settings.

3) 1997

4) Serogroup B is responsible for ~60% of disease in those under 24 years and college students are more than 3x the risk compared to people not attending college.

Contact Information

Jessica Lopeman, MPH, BSN, RN-BC, a-IPC

Jessica.Lopeman@mt.gov

Office: 406-444-3165

Confidential Fax: 1-800-616-7460

Post-Test

Please complete your Post Test by following this link

https://hipaa.jotform.com/221934379528163

Questions Listed here for Reference

Public Health Reporting

1. How many reportable diseases and conditions are listed in ARM 37.114.203?
    a. 67
    b. 71
    c. 63
    d. 78

2. Finish the sentence: "ARM 37.114.201: … Any person… who knows or has reason to believe that a case exists of a reportable disease or condition defined in ARM 37.114.203 _____ to the local health officer the information specified in ARM 37.114.205."
    a. must immediately report to
    b. must report within 24-hours
    c. must report within 7 days
    d. must report in a timely manner

3. What is the most accurate definition for "Administrative Rules of Montana"?
    a. Agency regulations, standards, or statements of applicability that implement, interpret, or set law or policy.
    b. Rules that describe the organization, procedures, or practice requirements of the agency.
    c. Rules that have the force and effect of law.
    d. All of the above.
    e. None of the above.

Exploring Case Definition and Case Status

1. Case Definition Question: Select the false statement below related to surveillance case definitions.
   Surveillance case definitions:
    a. Use a set of uniform criteria to define diseases for public health surveillance
    b. Enable public health officials to classify and count cases consistently
    c. Are intended for healthcare providers to make clinical diagnoses
    d. Use case definitions developed by the Council of State and Territorial Epidemiologists (CSTE)

2. IP Question: What are the three types of transmission-based precautions used for communicable diseases in healthcare settings?
    a. Droplet, Respiratory, Airborne
    b. Airborne, Droplet, Contact
    c. Enteric, Droplet, Respiratory

Outbreak Investigation

1. Is Norovirus a reportable condition?
    a. Yes! All norovirus cases and outbreaks are reportable
    b. Norovirus outbreaks are reportable, but single cases are not
    c. Norovirus is not a reportable condition

2. A single case of vibriosis was diagnosed in Montana in the last year. What level of disease does it refer to?
    a. Sporadic disease
    b. Endemic disease
    c. Pandemic disease
    d. Epidemic disease

Public Health Management of Syphilis

1. A 34-weeks pregnant person is treated for secondary syphilis. What time frame after start of treatment would we not consider her child to have congenital syphilis?
    a. 45 days
    b. 30 days
    c. 28 days
    d. 14 days

2. What treatment is acceptable in a pregnant person with late latent syphilis?
    a. Erythromycin
    b. Vancomycin
    c. Benzathine Penicillin G
    d. Doxycycline
    e. There is no acceptable treatment

Vaccine Preventable Disease

1. What case classification(s) does Diphtheria have?
    a. Suspect
    b. Probable
    c. Confirmed
    d. Both A and C
    e. Both B and C

2. Which disease(s) listed below have required vaccinations in order to attend school in Montana? Please select all applicable choices.

a. Varicella (Chickenpox)
b. Shingles
c. Measles
d. COVID-19

Running a Report in MIDIS

1. Which Reports section is only visible to you?
    a. Reporting Facility Reports
    b. Private Reports
    c. Template Reports
    d. Public Reports

2. Which option is better for large datasets?
    a. Run
    b. Export

3. How often are the data in reports updated?
    a. Weekly
    b. Daily
    c. Hourly

4. T or F: I should use a Private Report so that other LHJs can't run it and see data on my residents
    a. T
    b. F - Reports are Jurisdiction restricted