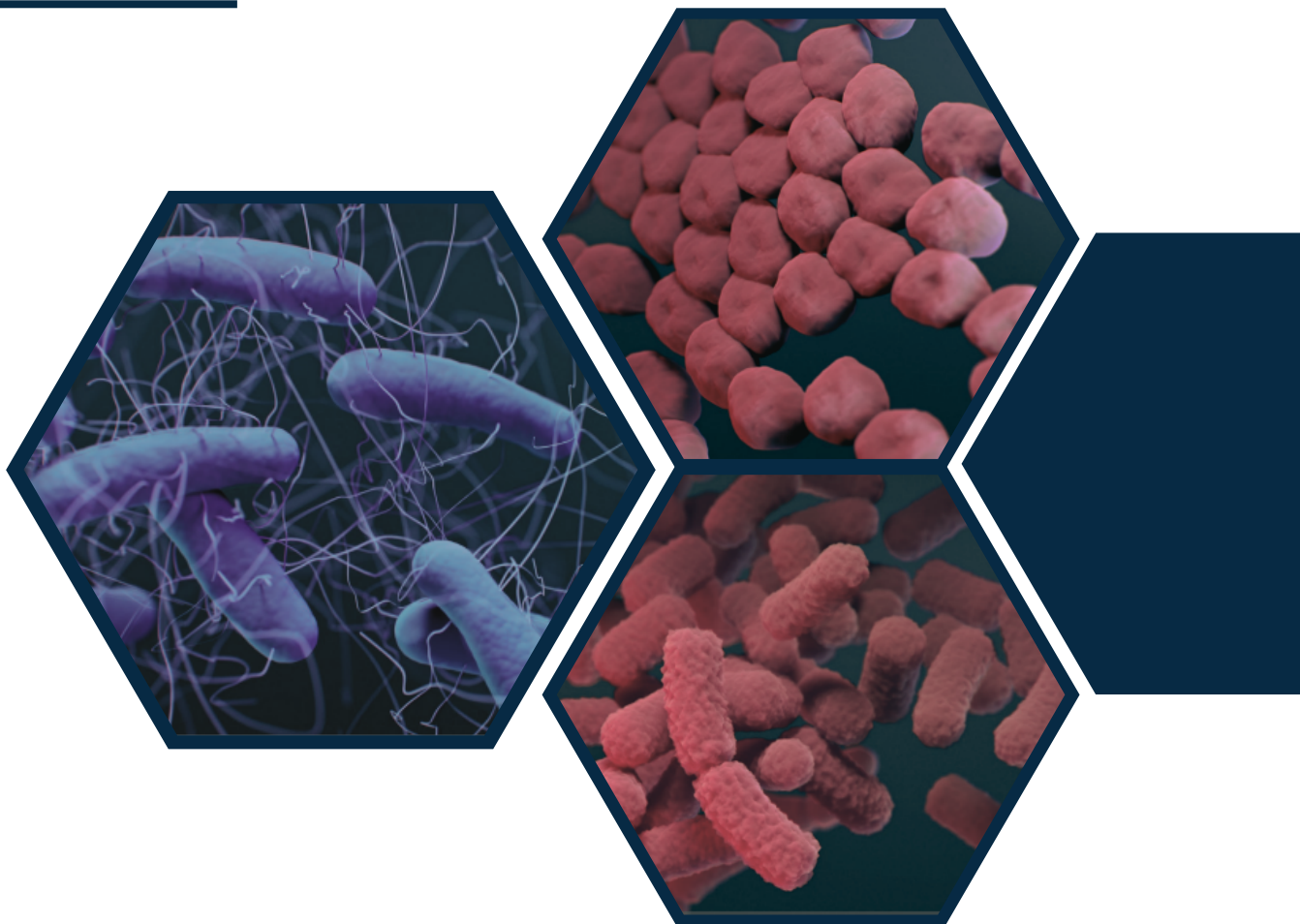


2023 Annual Report

Infection Control and Prevention and Healthcare- Associated Infections in Montana



Prepared by

The Infection Control and Prevention and Healthcare-Associated Infections Section

Public Health and Safety Division

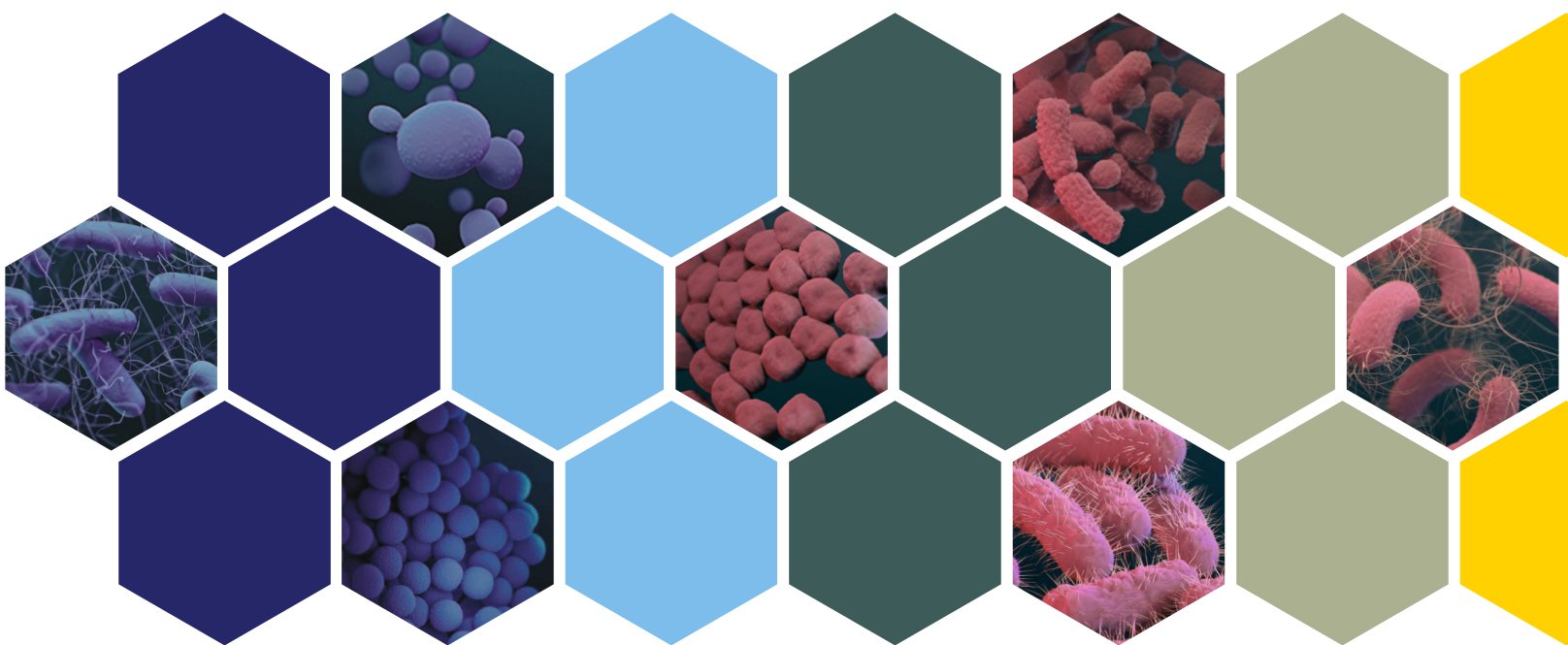
Montana Department of Public Health and Human Services (DPHHS)



MONTANA
INFECTION CONTROL AND
HEALTHCARE-ASSOCIATED
INFECTIONS SECTION

Table Of Contents

Message from the DPHHS Public Health Physician and State Epidemiologist	2
<u>Who We Are & What We Do</u>	3-4
<u>Preface</u>	5
<u>Healthcare-Associated Infections: National Healthcare Safety Network</u>	6-9
<u>Multidrug-Resistant Organisms</u>	10-11
<u>Antimicrobial Stewardship</u>	12-13
<u>Healthcare Facility Outbreaks</u>	14
<u>Infection Control and Prevention</u>	15-17
<u>Educational Training and Resources</u>	17-18
<u>Acknowledgements and References</u>	19
<u>Appendix I: Diseases Reportable to Public Health in Montana, 2023</u>	20
<u>Appendix II: Diseases Requiring Confirmation with Public Health in Montana, 2023</u>	21



Message from the DPHHS Public Health Physician and State Epidemiologist

As we resume more traditional public health activities following the expiration of the federal COVID-19 Public Health Emergency, the Montana public health workforce emerges with enhanced infection control and prevention skills for preventing and controlling communicable disease.

The prevention and control of communicable disease is one of the most important aspects of public health practice in the United States and is necessary to ensure the health and well-being of Montana citizens. Core public health activities include:

- Responding to and tracking outbreaks of infectious diseases, such as influenza, norovirus, respiratory syncytial virus (RSV), and
- Newly emerging diseases or threats, such as carbapenemase-producing carbapenem-resistant organisms;
- Testing for and treating infectious diseases;
- Preparing healthcare facilities for disease outbreaks of all scales; and
- Providing education and key messaging to prevent transmission of disease.

The unique nature of this work requires staff to be 'on call' for disease reporting, consultation, and outbreak investigation to quickly respond to communicable disease urgencies and emergencies.

Over the last year, the Montana Department of Public Health and Human Services (DPHHS) has worked closely with local and tribal health jurisdictions and Montana healthcare facilities as we collectively exercised our outbreak response skills to effectively manage the continued spread of COVID-19 in our healthcare facilities by promoting prevention through readily available vaccination, and supporting efficient disease recognition, diagnosis, and treatment, when necessary, as well as improved infection control and prevention measures. We also worked together in new ways to raise awareness and provide education on the increased incidence of carbapenemase-producing carbapenem-resistant organisms in Montana and the emergence of *Candida auris* infections in surrounding states.

The Montana Infection Control and Prevention and Healthcare-Associated Infections Annual Report summarizes and highlights the work of the Montana Infection Control and Prevention and Healthcare-Associated Infections Section in conjunction with local and tribal health jurisdictions and partners during 2023. Data trends and public health events of importance are described and analyzed in order to understand the impact of specific communicable diseases on the health of people living in Montana.

We thank the public health staff who have demonstrated inspiring resiliency following a pandemic response as we pivot to resume the traditional public health activities that keep our Montana communities safe and healthy!



Maggie Cook-Shimanek, M.D., M.P.H.
Public Health Physician
Montana Department of Public Health and Human Services

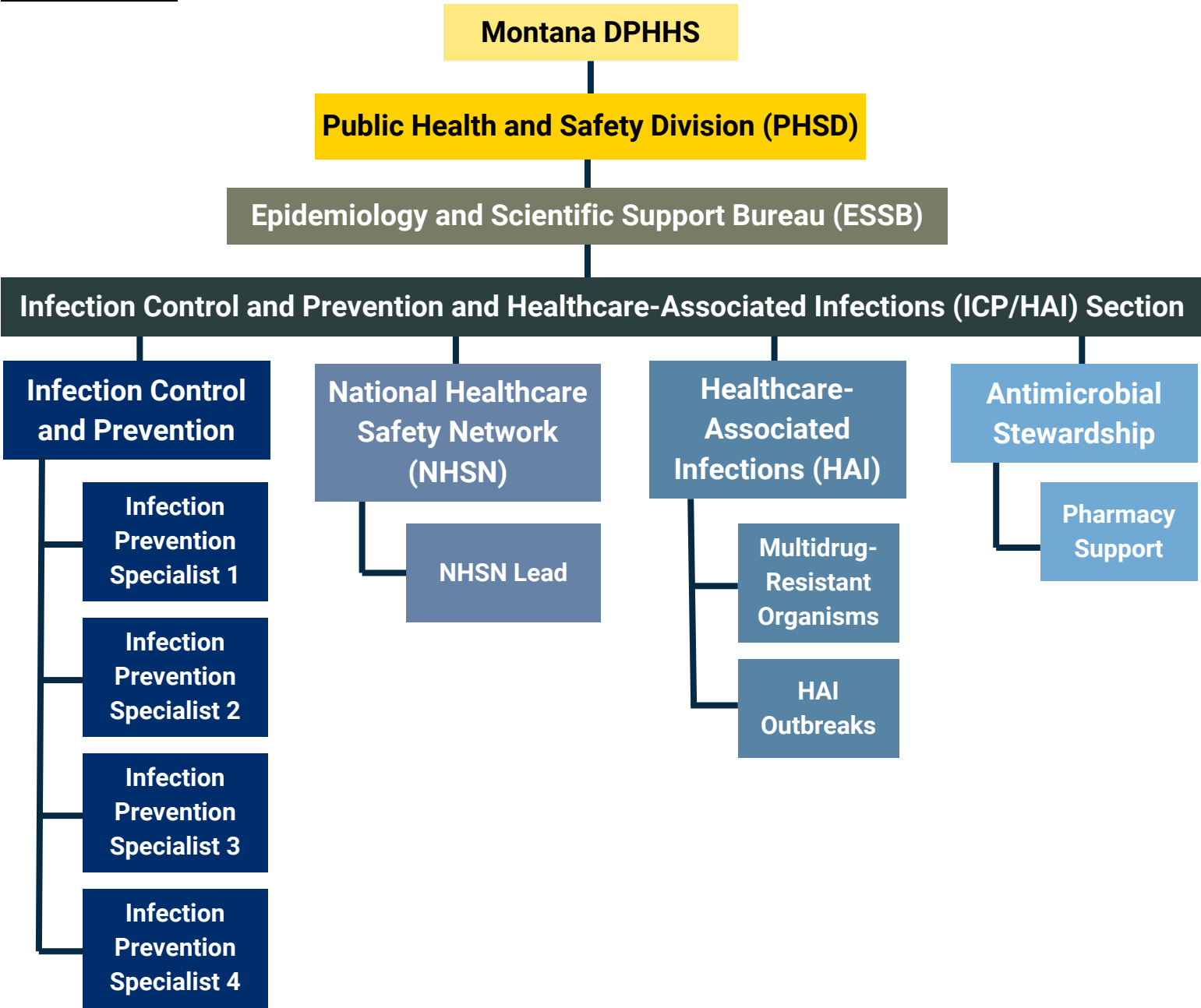


Laura Williamson, M.P.H.
State Epidemiologist
Montana Department of Public Health and Human Services



In December 2021, the Healthcare-Associated Infection program, historically embedded in the Communicable Disease Epidemiology Section, became its own section, called the Infection Control and Prevention/Healthcare-Associated Infections Section (ICP/HAI). The section consists of a section supervisor, four infection prevention specialists, one epidemiologist, one contracted infection preventionist, and two contracted pharmacy specialists.

Meet the Team!



The Montana ICP/HAI Section's mission is to increase infection control expertise across the healthcare spectrum in Montana through training, education, and infection control assessments. To achieve this, the Montana ICP/HAI Section works closely with stakeholders from around the state including, but not limited to:

Montana DPHHS

- Epidemiology and Scientific Support Bureau
- Communicable Disease and Prevention Bureau
- Montana Public Health Laboratory
- Office of Inspector General
- Community Services Bureau
- Local/Tribal Public Health Jurisdictions
- Disaster Emergency Services

Outside Stakeholders

- Montana Hospital Association
- University of Montana Skaggs School of Pharmacy
- Montana Public Health Institute
- Mountain-Pacific Quality Health
- Montana Healthcare Facilities

The Montana ICP/HAI Section offers the following services to all Montana healthcare facilities: Infection Control Assessments and Response (ICAR), outbreak consultations (disease-specific and infection control and prevention-specific), training and webinars, creation of tools and resources, and one-on-one support.

These services are offered to over 400 healthcare facilities, with the current landscape of Montana healthcare facilities including:

- 15 Acute Care Hospitals
- 48 Critical Access Hospitals
- 1 Long-Term Acute Care Hospital
- 1 Rehabilitation Hospital
- 210 Assisted Living Facilities
- 61 Long-Term Care/Skilled Nursing Facilities
- 17 Dialysis Facilities
- 33 Surgery Centers
- Many Outpatient and Dental Facilities



The 2023 Annual Report: Infection Prevention and Control and Healthcare-Associated Infections in Montana contains data for notifiable diseases and other conditions reported to Montana DPHHS in 2023. Data are collected from local and tribal public health jurisdictions, laboratories, and healthcare facilities through direct reporting as dictated in the Administrative Rules of Montana (ARM) [37.114.203](#) and [37.114.313](#) or through the National Healthcare Safety Network (NHSN).

Key Highlights

Healthcare-Associated Infections: NHSN

For the first time since 2017, Montana Acute Care Hospitals have surpassed the national reduction goal for central line-associated bloodstream infections in 2023. Catheter-associated urinary tract infections and Healthcare-Onset *Clostridioides difficile* infections continue to decrease in 2023.

Multidrug-Resistant Organisms

Since the first carbapenemase-producing carbapenem-resistant organism (CP-CRO) case was identified in 2019, Montana has identified 13 CP-CROs detected from Montana healthcare facilities or Montana residents through 2023. Five of these CP-CROs (38%) were identified in 2023.

Antimicrobial Stewardship

79% (n=42) of Montana Critical Access Hospitals attested to meeting all 7 core elements of antimicrobial stewardship in the National Healthcare Safety Network (NHSN). 100% (n=15) of all other Montana hospitals including Prospective Payment System, Veteran, and Indian Health Services Hospitals attested in NHSN to meeting all 7 core elements. Thirty-nine Montana healthcare facilities participated in the 2023 Montana antimicrobial stewardship program.

Healthcare Facility Outbreaks

The team investigated the following outbreaks and clusters:

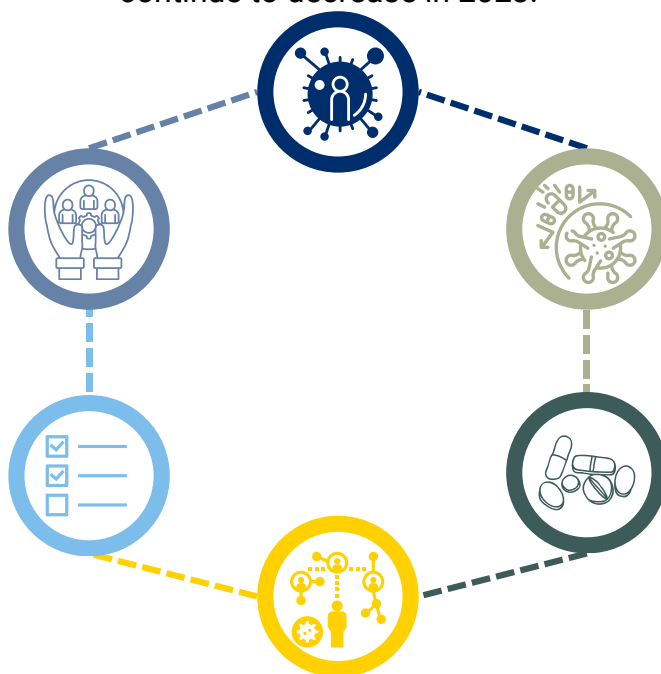
- **410** COVID-19
- **35** Norovirus
- **8** Influenza
- **5** Carbapenemase-Producing Organisms
- **3** Group A *Streptococcus*
- **2** Multidrug-Resistant Organisms
- **1** *Clostridioides difficile*

Educational Trainings and Resources

The MT DPHHS ICP/HAI Section provided over 80 educational webinars and created over 20 resources for Montana healthcare facilities. The MT DPHHS ICP/HAI section provided over \$1.4 million in mini-grants to Montana healthcare facilities to improve infection control.

Infection Control and Prevention

The MT DPHHS ICP/HAI Section completed 36 infection control assessment and responses (ICARs), driving almost 28,000 miles across Montana. Twenty outbreak consultations were conducted. Five skills fairs were conducted in 2023 with over 136 staff being trained as part of these events.



Healthcare-Associated Infections- National Healthcare Safety Network

What is NHSN?

The National Healthcare Safety Network (NHSN) is a nationwide healthcare-associated infection (HAI) tracking system administered by the Centers for Disease Control and Prevention (CDC). It began with 300 hospitals decades ago and now has over 38,000 healthcare facilities including all hospitals, nursing homes, dialysis centers, and ambulatory surgery centers.

NHSN helps to:

- Identify infection prevention problems by facility, state, or specific quality improvement projects.
- Benchmark progress of infection prevention efforts.
- Comply with state and federal public reporting mandates.*
- Drive national progress towards the elimination of HAIs.

**Montana healthcare facilities are required to only report federal Centers for Medicaid and Medicare Services (CMS) requirements, there are no additional state reporting requirements. Montana healthcare facilities must give DPHHS permission to view their NHSN data (confer rights). In 2023, 86 of the eligible 115 Montana healthcare facilities including dialysis, hospitals, and outpatient surgery centers conferred rights. Data in this report only include those facilities which have given DPHHS confer rights.*

What do the summary measures mean?

The standardized infection ratio (SIR) is a summary measure created by NHSN and the CDC that can be used to track HAIs over time and can be calculated on a variety of levels, including unit, facility, state, and nation. It adjusts for differences between healthcare facilities such as types of patients and procedures, as well as other factors such as the facility's size and whether it is affiliated with a medical school. It compares the number of infections reported by a facility within a given time period to the number of infections that were predicted using data from a baseline time period, which varies for different infection types. The predicted number of infections is calculated by the CDC using information submitted by facilities through the annual survey. Lower SIRs indicate that the facility had less infections than expected.

$$\text{SIR} = \frac{\text{Observed HAIs}}{\text{Predicted HAIs}}$$

- An SIR of 1.0 means the observed number of infections is equal to the number of predicted infections.
- An SIR greater than 1.0 means there were more infections than predicted. For example, if a facility has a CLABSI SIR=1.5, they experienced 50% more CLABSIs than predicted.
- An SIR less than 1.0 means there were fewer infections than predicted. For example, if a facility has a CLABSI SIR=0.8, they experienced 20% fewer CLABSIs than predicted.

The cumulative attributable difference (CAD) is another measure created by NHSN and the CDC that can be used to help target HAI prevention efforts. It determines the number of infections that needed to be prevented during a specific timeframe to reach the target SIR.

$$\text{CAD} = \text{Observed HAIs} - (\text{Predicted HAIs} * \text{SIR}_{\text{Target}})$$

- A CAD greater than 0 means that there were more infections than predicted to reach the target SIR. For example, if the target SIR was 0.7 and the facility had 7 infections but was only predicted to have 3.3 infections, 5 infections would have needed to be prevented to reach the target SIR of 0.7.
- A CAD less than or equal to 0 means that there were equal to or fewer infections than predicted to reach the target SIR.

How to interpret the SIR 95% Confidence Interval (CI):

- If the CI does not include 1 in its range, then the SIR is significantly different than 1.0 (the national baseline), meaning the number of infections is significantly different than the number of predicted infections. Example: 95% CI= (0.29, 0.97).
- If the CI does include 1 in its range, then the SIR is not significantly different than 1.0, and the number of infections is not significantly different than the number of observed infections. Example: 95% CI= (0.15, 1.37).

Healthcare-Associated Infections- National Healthcare Safety Network

Catheter-Associated Urinary Tract Infection (CAUTIs)

An indwelling urinary catheter, sometimes referred to as a foley catheter, is a drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system. A catheter-associated urinary tract infection (CAUTI) occurs when germs (usually bacteria) enter the urinary tract through the urinary catheter and cause infection. CAUTIs have been associated with increased morbidity, mortality, healthcare costs, and length of stay. Healthcare facilities can prevent CAUTIs by following appropriate infection prevention recommendations when inserting and maintaining indwelling urinary catheters, and by removing a urinary catheter as soon as it is no longer medically necessary.

The statewide CAUTI data shown below only includes Montana Acute Care Prospective Payment System (PPS) Hospital data. Acute Care PPS Hospitals are required by the CMS to submit CAUTI data for the following units: Adult Intensive Care Units (ICUs), Pediatric ICUs, and Neonatal ICUs (NICU), as well as Adult and Pediatric Medical, Surgical & Medical/Surgical Wards. For the purposes of this report, all CAUTI data reported from Rehab and NICU units have been removed as these are not included in the calculation of the National SIR completed by CDC.

In Montana, no pattern has been observed indicating a seasonality for CAUTIs. Montana Acute Care Hospitals reported a decrease in both the number of observed CAUTIs and the SIR in 2023 compared to 2022, as described in Table 1. There was a decrease of 15% in the total number of observed CAUTIs in 2023 compared to 2022. There was a decrease of 4% in the CAUTI SIR in 2023, decreasing from 0.55 in 2022 to 0.53 in 2023, as shown in Figure 1. The Montana Acute Care Hospital CAUTI SIR remained below the HHS Target SIR of 0.7. Because the CAUTI SIR has remained below the HHS Target SIR, the CAD has remained at zero indicating that no infections needed to be prevented to reach the SIR goal.

FIGURE 1. CATHETER-ASSOCIATED URINARY TRACT INFECTIONS (CAUTI) STANDARDIZED INFECTION RATIOS (SIR) FOR MONTANA ACUTE CARE HOSPITALS SUBMITTING DATA TO NHSN, 2019-2023.

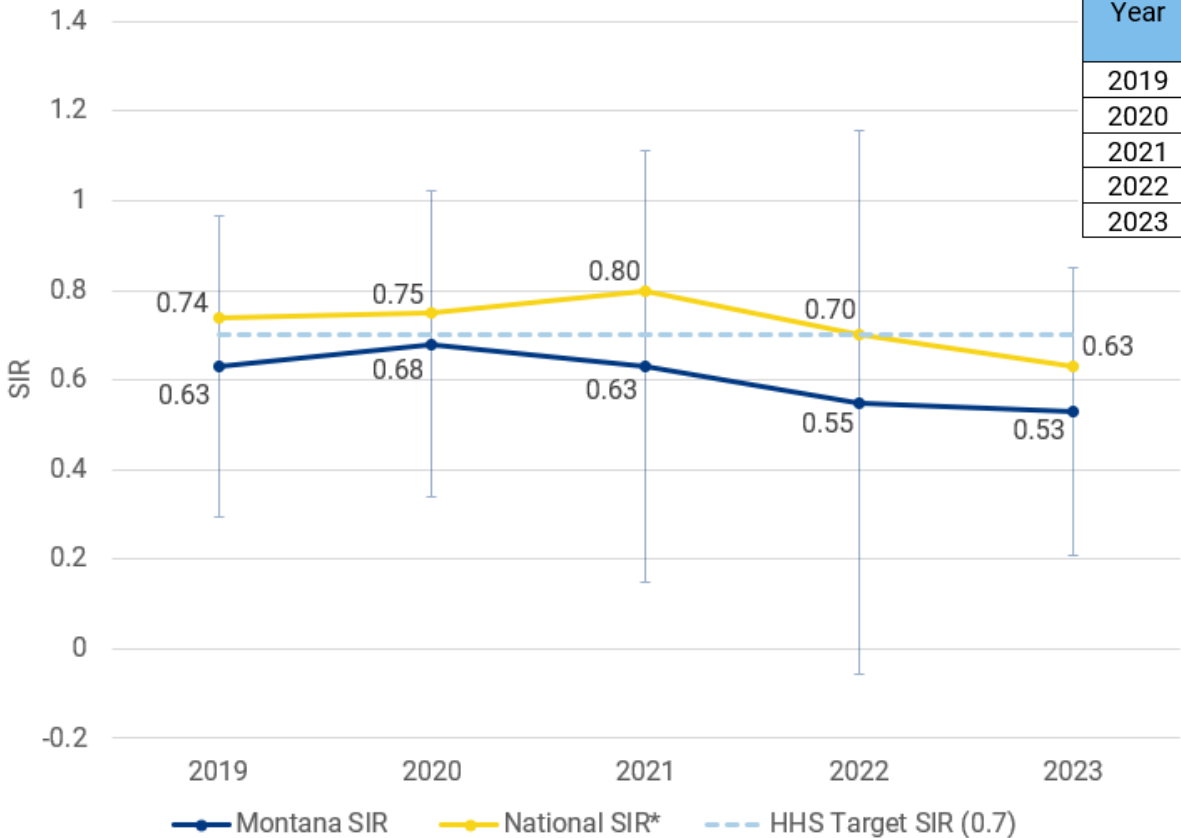


TABLE 1. CATHETER-ASSOCIATED URINARY TRACT INFECTIONS (CAUTI) ACTUAL AND PREDICTED NUMBER OF EVENTS AND CUMULATIVE ATTRIBUTABLE DIFFERENCE (CAD) MONTANA ACUTE CARE HOSPITALS SUBMITTING DATA TO NHSN, 2019-2023.

Year	Number of Events	Predicted Number of Events	CAD
2019	31	49.25	0
2020	36	52.72	0
2021	47	74.54	0
2022	39	70.46	0
2023	33	62.73	0

Central Line-Associated Bloodstream Infections (CLABSIs)

A central line (also known as a central venous catheter) is a catheter (tube) that healthcare providers often place in a large vein in the neck, chest, or groin to give medication or fluids or to collect blood for medical tests. Central lines are different from intravenous therapy because central lines access a major vein that is close to the heart and can remain in place for weeks to months and be much more likely to cause serious infection. Central lines are commonly used in intensive care units. A central line-associated bloodstream infection (CLABSI) is a serious infection that occurs when germs (usually bacteria or viruses) enter the bloodstream through the central line. Healthcare providers must follow a strict protocol when inserting the line to make sure the line remains sterile and a CLABSI does not occur. In addition to inserting the central line properly, healthcare providers must use stringent infection control practices each time they check the line or change the dressing. Healthcare facilities can prevent CLABSIs by following appropriate infection prevention recommendations when placing and maintaining a central line, and by removing a central line as soon as it is no longer medically necessary.

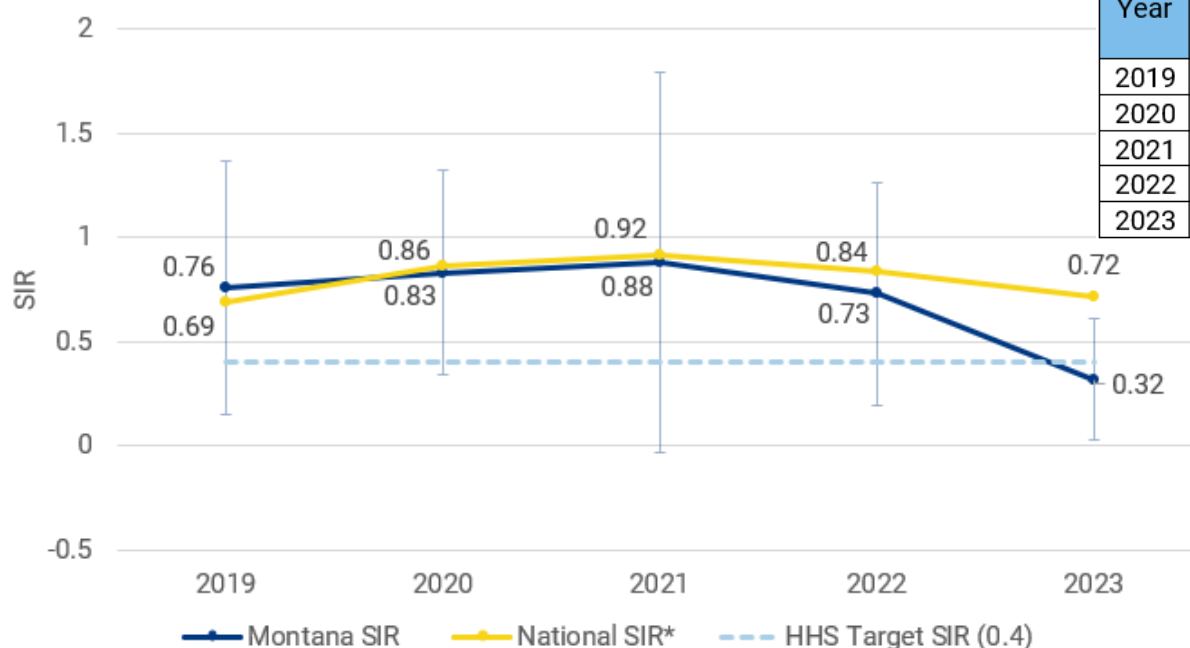
The statewide CLABSI data shown below only includes Montana Acute Care PPS Hospital data. Acute Care PPS Hospitals are required by the CMS to submit CLABSI data for the following units: Adult Intensive Care Units (ICUs), Pediatric ICUs, and Neonatal ICUs (NICU), as well as Adult and Pediatric Medical, Surgical & Medical/Surgical Wards. For the purposes of this report, all CLABSI data reported from Rehab and NICU units have been removed as these are not included in the calculation of the National SIR completed by CDC.

In Montana, no pattern has been observed indicating a seasonality for CLABSIs. Montana Acute Care Hospitals had a decrease in both the number of observed CLABSIs and the SIR in 2023 compared to 2022, as described in Table 2. There was a decrease of 58% in the total number of observed CLABSIs in 2023 compared to 2022. There was a decrease of 56% in the CLABSI SIR in 2023, decreasing from 0.73 in 2022 to 0.32 in 2023, as shown in Figure 2. This is the first time since 2017 (0.43), that Montana Acute Care Hospitals have reached the HHS Target SIR of 0.4. In 2023, the Montana Acute Care Hospitals had a CLABSI CAD of 0 indicating that no infections needed to be prevented to reach the SIR goal.

TABLE 2. CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS (CLABSI) ACTUAL AND PREDICTED NUMBER OF EVENTS AND CUMULATIVE ATTRIBUTABLE DIFFERENCE (CAD) MONTANA ACUTE CARE HOSPITALS SUBMITTING DATA TO NHSN, 2019-2023.

Year	Number of Events	Predicted Number of Events	CAD
2019	24	31.55	12
2020	26	31.25	14
2021	33	37.62	18
2022	26	35.61	12
2023	11	34.61	0

FIGURE 2. CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS (CLABSI) STANDARDIZED INFECTION RATIOS (SIR) FOR MONTANA ACUTE CARE HOSPITALS SUBMITTING DATA TO NHSN, 2019-2023.



*National SIR Data acquired from CDC HAI Progress Reports for 2019-2023

Healthcare-Associated Infections- National Healthcare Safety Network

Healthcare-Onset *Clostridioides difficile* Infection (CDIs)

Clostridioides difficile (*C. difficile*) is a bacterium that naturally resides in the bowels of some people without symptoms of infection. *C. difficile* is responsible for a spectrum of *C. difficile* infections (CDI), including gastrointestinal illness which can lead to severe complications including sepsis and death. CDI can occur when *C. difficile* spores are transferred to patients via the hands of healthcare personnel or other contaminated surfaces or items. Healthcare facilities can prevent CDI by using antibiotics wisely and following infection prevention recommendations, including hand hygiene, environmental cleaning, and Contact Precautions, a type of transmission-based precaution, to prevent the spread of *C. difficile* in the healthcare setting.

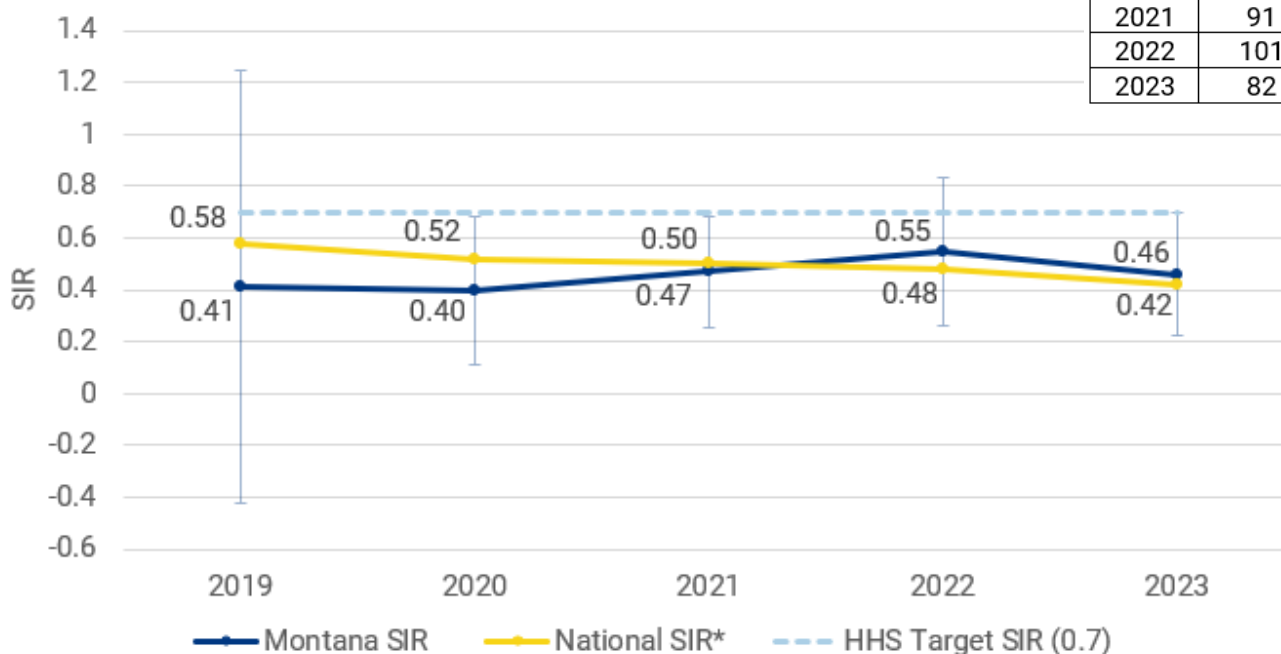
The statewide CDI data shown below only includes Montana Acute Care PPS Hospital data.

In Montana, a pattern can be seen with healthcare-onset CDIs, with the highest percentage of infections and SIRs occurring for the period between January and March. Montana Acute Care Hospitals had a decrease in both the number of observed CDIs and the SIR in 2023 compared to 2022, as described in Table 3. There was a decrease of 19% in the total number of observed CDIs in 2023 when compared to 2022. There was a decrease of 16% in the CDI SIR in 2023, decreasing from 0.55 in 2022 to 0.46 in 2023, as shown in Figure 3. The Montana Acute Care Hospital CDI SIR remained below the HHS Target SIR of 0.7 in 2023 with the SIR returning to lower levels similar to before the COVID-19 pandemic. Because the CDI SIR has remained below the HHS Target SIR, the CAD has remained at zero indicating that no infections needed to be prevented to reach the SIR goal.

TABLE 3. LABORATORY-IDENTIFIED HEALTHCARE-ONSET *C. DIFFICILE* INFECTIONS (CDI) ACTUAL AND PREDICTED NUMBER OF EVENTS AND CUMULATIVE ATTRIBUTABLE DIFFERENCE (CAD) MONTANA ACUTE CARE HOSPITALS SUBMITTING DATA TO NHSN, 2019-2023.

Year	Number of Events	Predicted Number of Events	CAD
2019	70	169.97	0
2020	63	156.8	0
2021	91	191.8	0
2022	101	185.32	0
2023	82	177.29	0

FIGURE 3. LABORATORY-IDENTIFIED HEALTHCARE-ONSET *C. DIFFICILE* INFECTIONS (CDI) STANDARDIZED INFECTION RATIOS (SIR) IN MONTANA HOSPITALS SUBMITTING DATA TO NHSN, 2019-2023.



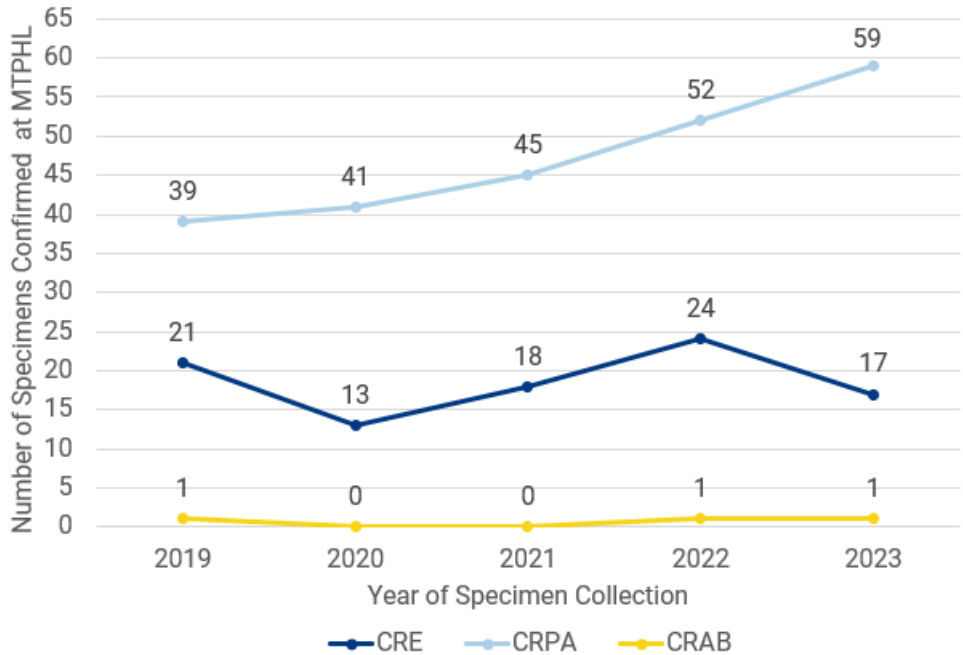
*National SIR Data acquired from CDC HAI Progress Reports for 2019-2023

In Montana, select multidrug-resistant organisms (MDROs), including *Candida auris*, carbapenem-resistant organisms (CROs), carbapenemase-producing organisms (CPOs), vancomycin-intermediate *Staphylococcus aureus* (VISA), and vancomycin-resistant *Staphylococcus aureus* (VRSA), are reportable as required by the Administrative Rules of Montana [37.114.203](#) and [37.114.313](#). Outbreaks of other MDROs are also monitored, such as methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus*.

Carbapenem-Resistant Organisms (CROs)

CROs are organisms that are resistant to the antibiotic class of carbapenems. The most common CROs within the United States are within the Enterobacterales order (CRE), *Acinetobacter baumannii* (CRAB), and *Pseudomonas aeruginosa* (CRPA). CROs are required to be sent to the Montana Public Health Laboratory (MTPHL) for confirmation. In 2023, the number of CRE specimens confirmed at MTPHL decreased by 29.2% and CRPA specimens confirmed increased by 13.5%, compared to 2022, as shown in Figure 4. CRAB was detected in Montana in 2023; this was only the third time since 2019 that CRAB had been identified by the MTPHL.

FIGURE 4. NUMBER OF SPECIMENS CONFIRMED AS CRE, CRPA, AND CRAB AT THE MTPHL, 2019-2023.



Carbapenemase-Producing Organisms (CPOs)

CROs that produce carbapenemases, enzymes that break down the antibiotic class of carbapenems, are considered CPOs. The carbapenemase gene can be easily shared between bacteria, leading to the rapid spread of resistance. These organisms can be spread within the healthcare setting through contaminated healthcare worker hands or through contaminated equipment.

Since the first CPO case was identified in 2019, Montana has had a total of thirteen confirmed CPO cases detected from Montana healthcare facilities or Montana residents through 2023, as described in Table 4. In 2023, five CPOs were identified from Montana healthcare facilities or Montana residents prompting a public health response. Two CP-CREs identified in 2023 were identified with the carbapenemase gene of New Delhi Metallo-beta-lactamase (NDM). Two CP-CRAB were identified in 2023 with the carbapenemase gene of Oxacillinase 23 (OXA-23). Montana identified its first CP-CRPA from a Montana healthcare facility in 2023. This CP-CRPA was identified with the carbapenemase gene of Verona integron-encoded metallo-β-lactamase (VIM). The second CP-CRPA was identified with a carbapenemase gene that was not one of the five commonly reported genes.

TABLE 4. ABBREVIATED LINE LIST OF REPORTED CP-CROS DETECTED FROM MONTANA HEALTHCARE FACILITIES OR MONTANA RESIDENTS, 2019-2023.

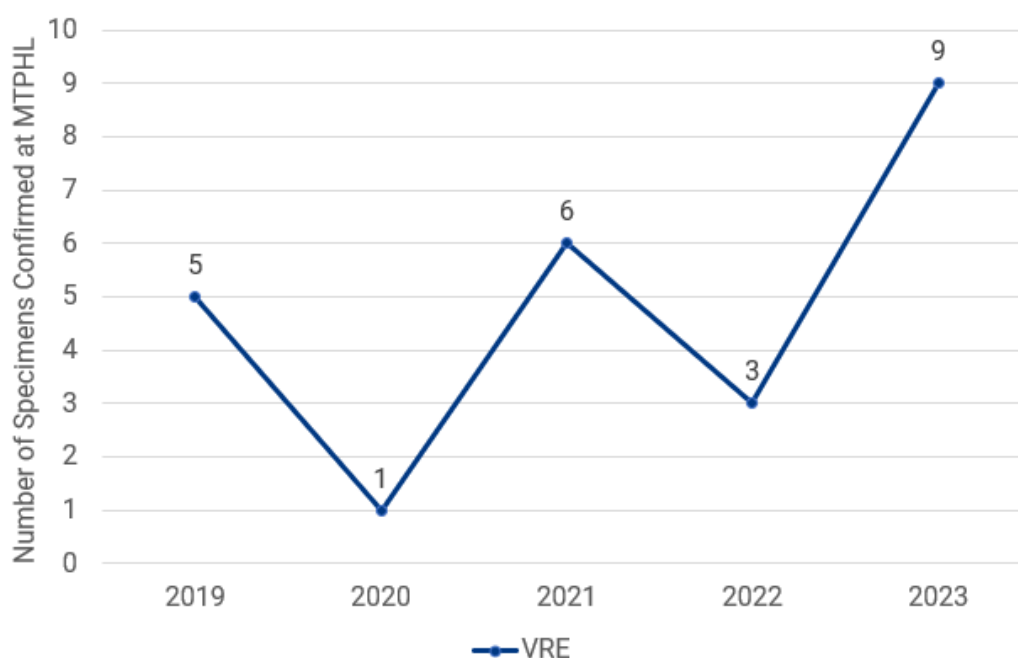
CPOs	2019	2020	2021	2022	2023
CP-CRE	3 <i>M. morganii</i>-IMP <i>P. mirabilis</i>-IMP <i>E. cloacae</i> complex - NDM (not MT resident)	1 <i>E. cloacae</i> complex-NDM	1 <i>E. cloacae</i> complex-NDM	3 <i>K. pneumoniae</i>-KPC <i>K. pneumoniae</i>-NDM (also CP-CRAB)* <i>E. cloacae</i> complex-other	2 <i>E. coli</i>-NDM <i>K. pneumoniae</i>-NDM
CP-CRPA	0	0	0	0	2 <i>P. aeruginosa</i>-VIM <i>P. aeruginosa</i>-Other (also CP-CRAB) *
CP-CRAB	0	0	0	1 <i>A. baumannii</i>-OXA235 (also CP-CRE) *	2 <i>A. baumannii</i>-OXA23 (1-not MT resident; 1-also CP-CRPA*)

*Note, in 2022 and 2023, two of the cases had two different CPO genes detected, therefore the sum of CPO genes detected is 15 but the total number of individuals with a positive CPO result remains at 13.

Vancomycin-Resistant Organisms

Vancomycin is an antibiotic used to treat bacterial infections throughout the body and is frequently used for individuals with penicillin allergies. The most common vancomycin-resistant organisms within the United States are *Enterococcus* (VRE) and *Staphylococcus aureus* (VISA/VRSA). *Staphylococcus aureus* can also exhibit a range of resistance to vancomycin, with VRSA being the most resistant to vancomycin and VISA being intermediately resistant to vancomycin. VISA/VRSA infections are exceptionally rare in the United States and specimens are required to be sent to the MTPHL for confirmatory testing. Montana has not confirmed a specimen as VISA/VRSA since 2015, therefore, neither are included in Figure 5. Although, VRE is not specifically stated in the ARMs, VRE outbreaks are still reportable in all healthcare settings as outbreaks of communicable diseases in healthcare settings are specifically mentioned in ARM [37.114.203](#). VRE specimens can be sent to the MTPHL for confirmation. In 2023, the number of VRE specimens confirmed at the MTPHL increased by 200% compared to 2022, as shown in Figure 5.

FIGURE 5. NUMBER OF SPECIMENS CONFIRMED AS VRE AT THE MTPHL, 2019-2023.



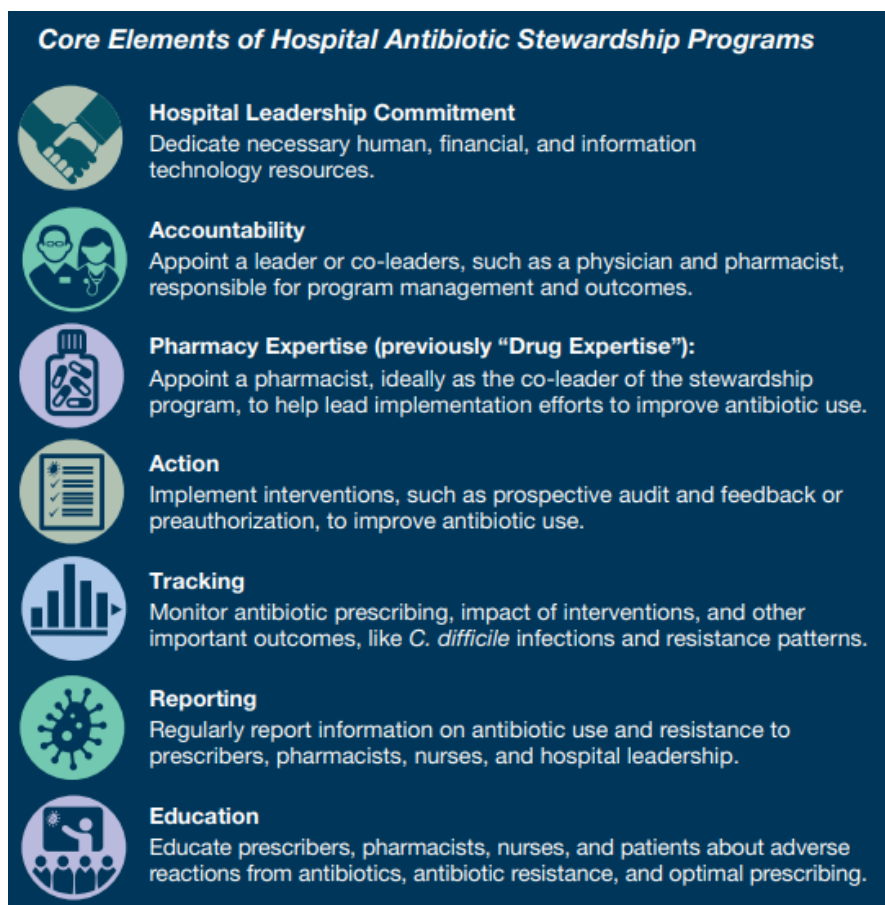
Candida auris

Candida auris (*C. auris*) is a type of yeast that can cause severe illness and spreads easily among patients in healthcare facilities. It is often resistant to antifungal treatments, which means that the medications that are designed to kill the fungus and stop infections do not work. *C. auris* has not been detected in Montana. However, for the first time, in 2023, a Montana resident was reported to the Montana DPHHS as a close contact of a *C. auris* case in an out-of-state healthcare facility. This demonstrates the increased need for screening within Montana healthcare facilities, especially among out-of-state transfers.

Core Elements of Antimicrobial Stewardship

Optimizing the use of antibiotics is critical to effectively treat infections, protect patients from harms caused by unnecessary antibiotic use, and combat antibiotic resistance. In 2014, CDC called on all hospitals in the United States to implement antibiotic stewardship programs and released the Core Elements of Hospital Antibiotic Stewardship Programs (Core Elements) to help hospitals achieve this goal. The Core Elements outlines structural and procedural components that are associated with successful stewardship programs. In 2015, The United States National Action Plan for Combating Antibiotic Resistant Bacteria set a goal for implementation of the Core Elements in all hospitals that receive federal funding. The Core Elements include the following: Hospital Leadership Commitment, Accountability, Pharmacy Expertise, Action, Tracking, Reporting, and Education, as described in Figure 6.

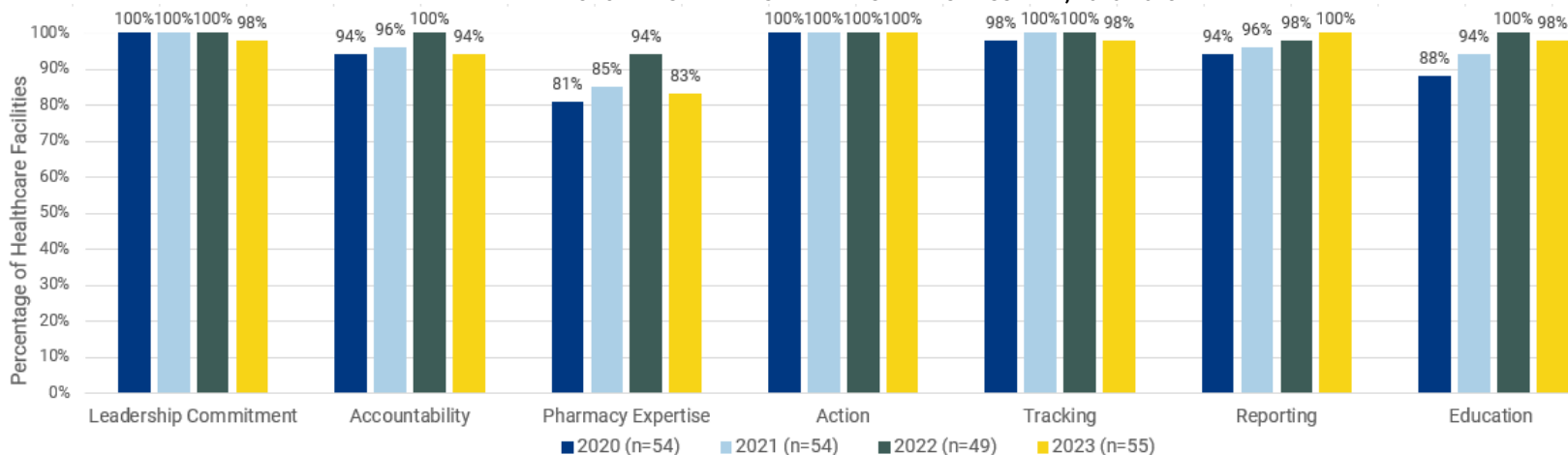
FIGURE 6. CDC CORE ELEMENTS OF ANTIMICROBIAL STEWARDSHIP



Healthcare facilities provide their attestation to meeting these core elements yearly through the NHSN Patient Safety and Long-Term Care Component Annual Surveys. All core element data was retrieved from NHSN via the Montana DPHHS DUA with NHSN and only includes data provided by hospitals including acute care, critical access, psychiatric, rehabilitation, veterans' and Indian Health Services.

In 2023, 37 (79%) critical access hospitals (CAH) attested to meeting all seven core elements. All other hospital types (15) attested to meeting all seven core elements in 2023. Overall, in all hospital types in 2023, there was a decrease in the percent of facilities meeting certain core elements, as shown in Figure 7. Pharmacy Expertise saw the greatest decrease (11.7%) from 2022, decreasing from 94% to 83%. Accountability also saw a notable decrease of 6% in 2023 when compared to 2022. Leadership Commitment, Tracking, and Education also saw a decrease of 2% in 2023 from 2022.

FIGURE 7. PERCENTAGE OF MONTANA HOSPITALS ATTESTING TO FULFILLING EACH OF THE SEVEN CORE ELEMENTS OF ANTIMICROBIAL STEWARDSHIP IN NHSN ANNUAL SURVEY, 2020-2023.



Montana Antimicrobial Stewardship Program

To aid Montana healthcare facilities in meeting the seven core elements of antimicrobial stewardship, the Montana DPHHS in conjunction with the University of Montana Skaggs School of Pharmacy, hosts a free yearly antimicrobial stewardship program.

A total of thirty-nine (39) facilities submitted a letter of enrollment in 2023: thirty-two (32) Critical Access Hospitals (CAH), one (1) Prospective Payment System (PPS) Hospital, one (1) Indian Health Service (IHS) facility, and five (5) Skilled Nursing Facilities (SNFs). Twenty-five (25) facilities completed the antibiogram survey, and twenty-one (21) submitted an antibiogram. Fifty-nine (59) facilities conferred rights to the National Healthcare Safety Network (NHSN). Of these facilities, fifty-five (55) completed the annual patient safety survey, and twenty-five (25) submitted 12 months of days of therapy (DOT) data. A scorecard providing the details of deliverables completed was created for each participating facility. For facilities that met all of the deliverables, a facility-specific report was prepared and distributed to the facility.

The measurable deliverables for 2023 included: Letter of Enrollment, Antibiogram Survey, Patient Safety Survey, and DOT data submission. Below are statistics of the deliverables completed, and additional data collected. Fifty-eight (58) facilities completed at least one deliverable (n=58), as described in Tables 5 and 6.

TABLE 5. ACTIVITIES MEASURED - MONTANA 2023 AMS PROGRAM.

Deliverable	Number (Percent)
Submitted Letter of Enrollment	37 (64%)
Antibiogram Survey	25 (43%)
Submitted Antibiogram	21 (36%)
Submitted Complete (12-Month) DOT Data	25 (43%)

TABLE 6. ADDITIONAL ACTIVITIES MEASURED - MONTANA 2023 AMS PROGRAM.

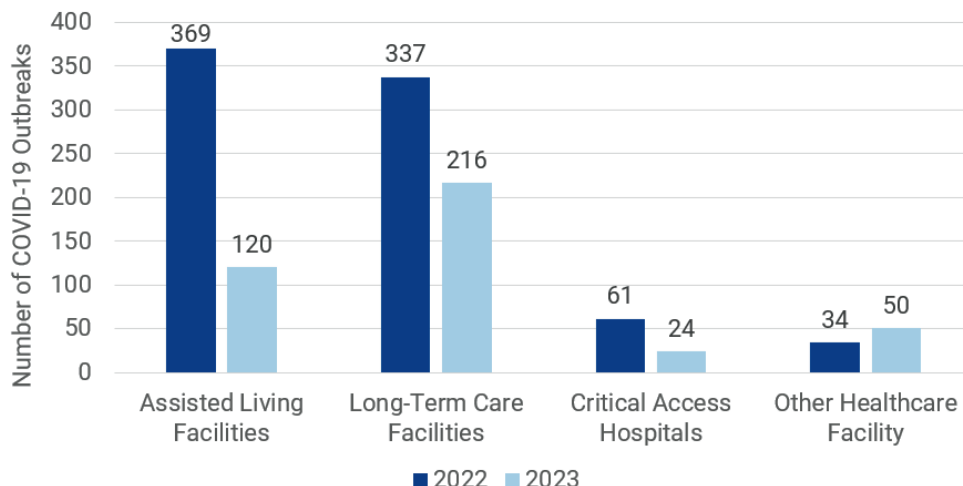
Additional Data Collected	Number (Percent)
Implementation of All 7 Core Elements of Antimicrobial Stewardship	47 (81%)
Completed Annual Patient Safety Survey in NHSN	55 (95%)
Data Submission to NHSN via the AUR Module (Minimum of 1 Month of Data)	22 (38%)

In Montana, all confirmed or suspected outbreaks of communicable diseases within all types of healthcare facilities are reportable as required by the Administrative Rules of Montana [37.114.203](#).

COVID-19

In 2023, the Montana ICP/HAI section investigated 410 COVID-19 outbreaks in healthcare facilities which was a decrease of 49% from 2022. Long-Term Care (LTCF) and Assisted Living (ALF) facilities accounted for 82% of healthcare COVID-19 outbreaks in 2023, as shown in Figure 8. Critical Access Hospitals (CAH) and other healthcare facilities accounted for the other 18% of healthcare COVID-19 outbreaks in 2023. In 2023, there were 432 COVID-19 outbreaks reported in all settings across Montana. Of those 432 COVID-19 outbreaks, 410 (95%) occurred in Montana healthcare settings.

FIGURE 8. TOTAL NUMBER OF COVID-19 OUTBREAKS BY HEALTHCARE FACILITY TYPE, 2022-2023.



Other Communicable Diseases

In December 2021, the section began to monitor other types of communicable disease outbreaks, in addition to COVID-19, in healthcare facilities. In 2023, Montana healthcare facilities saw an 169% increase in norovirus and acute gastrointestinal illness (AGI) and a 20% decrease in influenza outbreaks compared to 2022. Montana also saw an increase in Group A *Streptococcus* outbreaks in healthcare facilities. LTCF accounted for 61% of the other communicable disease outbreaks in 2023, followed by ALF (25%) and Hospitals (13%). In 2023, Montana healthcare facilities accounted for 71% of all GAS outbreaks, 54% of all norovirus and AGI outbreaks, and 41% of all influenza outbreaks reported, as described in Table 7.

TABLE 7. HEALTHCARE FACILITY OUTBREAKS OF COMMUNICABLE DISEASES EXCLUDING COVID-19, 2022-2023.

Disease	2022 - Healthcare Setting Outbreaks	2023- Healthcare Setting Outbreaks	2023 – All Setting Outbreaks	2023 - Percentage of All Outbreaks in Healthcare Settings
Norovirus/Acute Gastrointestinal Illness	13	35	65	54%
Influenza	10	7	17	41%
Acute Respiratory Illness	0	1	19	5%
Respiratory Syncytial Virus (RSV)	2	0	3	0%
Human metapneumovirus	1	0	0	N/A
Group A <i>Streptococcus</i>	0	5	7	71%
CPO	3	5	5	100%
<i>Yersinia enterocolitica</i>	0	1	1	100%
<i>Serratia marcescens</i>	1	1	1	100%
Methicillin-Resistant <i>S. aureus</i> (MRSA)	1	0	0	N/A
<i>C. difficile</i>	1	1	1	100%
Scabies	3	0	0	N/A
Total	35	56	119	47%

This table only includes commonly reported outbreaks in healthcare settings and does not include every type of communicable disease outbreak that occurs in Montana.

Infection Control Assessment and Response (ICAR)

ICARs are used to systematically assess a healthcare facility's infection control and prevention practices and guide quality improvement activities by identifying gaps and strengths of the facility's practices. The areas covered by ICARs include IPC program and infrastructure, training, auditing, and feedback, hand hygiene (HH), transmission-based precautions (TBP), environmental services (EVS), high-level disinfection, sterilization, infection safety, point-of-care (POC) testing, wound care, healthcare laundry, antibiotic stewardship, and water exposure. The Montana ICP/HAI section provides free, non-regulatory infection control assessments to all healthcare and congregate settings in Montana. In 2023, the Montana ICP/HAI section completed 36 ICARs, driving almost 28,000 miles across Montana. The distribution of ICARs completed by healthcare facility type is shown in Figure 9 and geographic distribution in Figure 10.

FIGURE 9. TOTAL NUMBER OF INFECTION CONTROL ASSESSMENT AND RESPONSE BY HEALTHCARE FACILITY TYPE, 2022-2023.

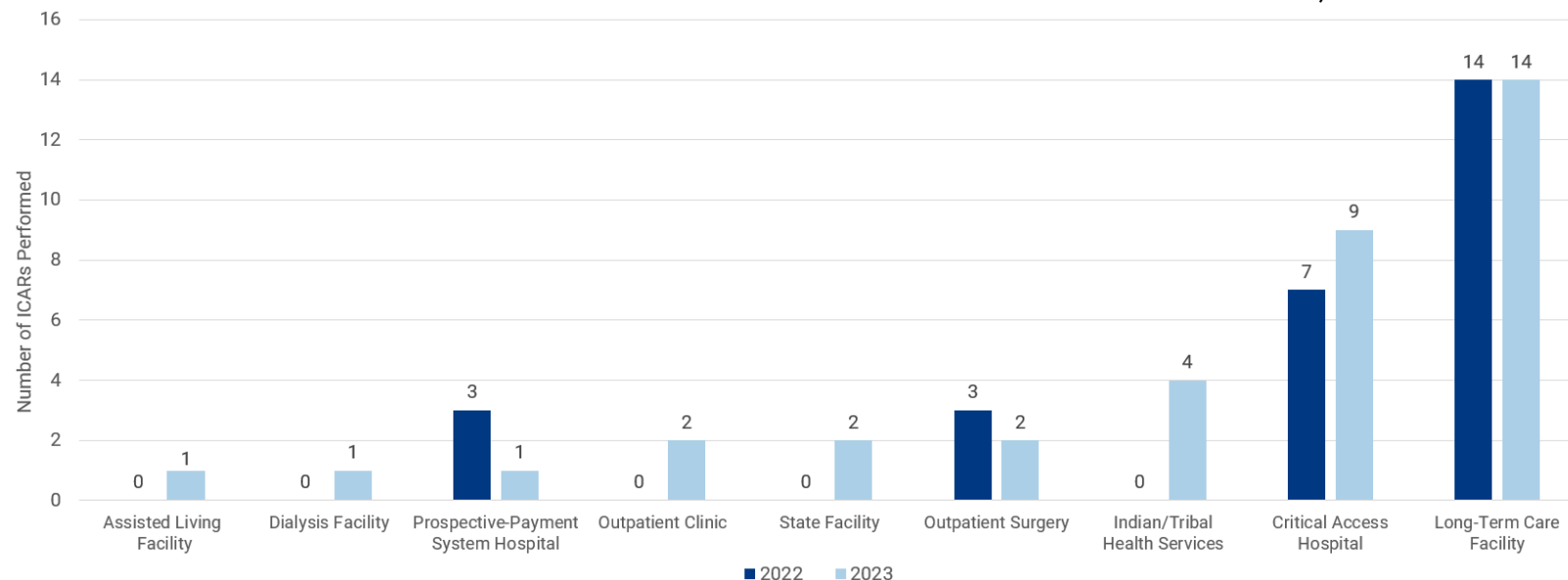
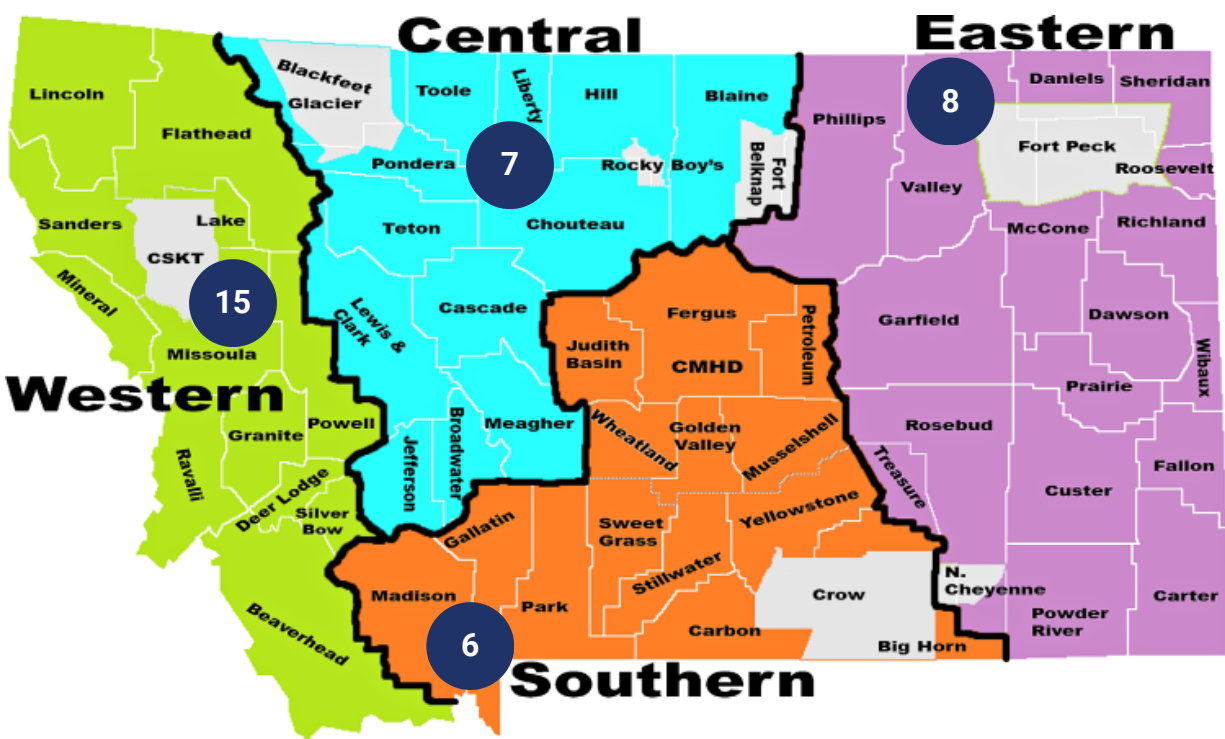


FIGURE 10. TOTAL NUMBER OF INFECTION CONTROL ASSESSMENT AND RESPONSE BY HEALTHCARE COALITION REGION, 2023.



Infection Control Assessment and Response (ICAR)

Each ICAR is tailored to the specific facility, with the selection of a few infection prevention and control modules that the facility identifies as areas of concern. Therefore, not every infection prevention and control area will be selected for each ICAR. After each ICAR is completed, a gap assessment is completed to help identify any areas that education and training can be developed and provided for. In 2023, the top gaps that were identified in infection prevention and control module containing at least 75% of all LTCFs/ALFs that received an ICAR were in healthcare laundry followed by EVS, TBP and hand hygiene, as shown in Table 8. The top gaps of 2023 identified in infection prevention and control module containing at least 75% of all for hospitals and outpatient facilities that received an ICAR were training, auditing, and feedback, EVS, IPC program and infrastructure, and hand hygiene. A gap assessment was not conducted on 4 ICARs as these were targeted ICARs in partnership with a stakeholder.

TABLE 8. AVERAGE PERCENTAGE OF ICAR ELEMENTS BEING FULFILLED BY INFECTION PREVENTION AND CONTROL MODULE AREA FOR EACH LOCATION TYPE, 2023.

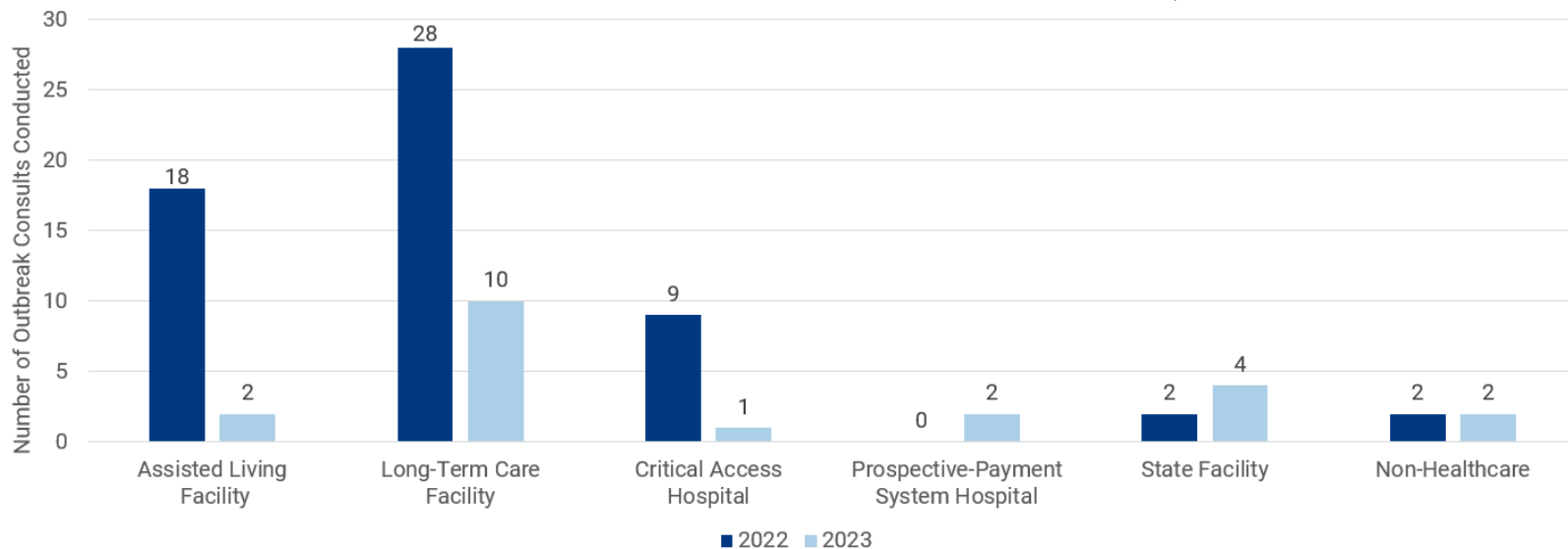
Infection Prevention and Control Module	LTCF/ALF (total n=15) % (n*)	CAH/PPS (total n=10) % (n*)	Outpatient (total n=7) % (n*)
IPC Program and Infrastructure	66% (15)	71% (10)	73% (7)
Training, Auditing, and Feedback	66% (15)	39% (10)	74% (7)
Hand Hygiene	59% (10)	73% (9)	75% (6)
TBP	52% (8)	83% (9)	64% (2)
EVS	51% (12)	51% (10)	56% (6)
High-Level Disinfection	N/A	70% (3)	82% (1)
Sterilization	N/A	73% (4)	56% (4)
High-Level Disinfection Quality Assurance	N/A	50% (3)	80% (1)
Sterilization Quality Assurance	N/A	49% (5)	93% (3)
Injection Safety	76% (6)	93% (7)	93% (5)
POC Testing	64% (7)	89% (7)	92% (3)
Wound Care	66% (11)	100% (1)	N/A
Healthcare Laundry - Offsite	41% (3)	50% (1)	68% (2)
Healthcare Laundry - Onsite	39% (9)	58% (6)	30% (3)
Healthcare Laundry-Laundry Personnel Training and Quality Assurance	31% (9)	37% (6)	29% (4)
Antibiotic Stewardship	66% (6)	70% (6)	100% (1)

*Number of facilities that selected the specific infection prevention and control module area.

Outbreak Consultations

Healthcare and congregate settings in Montana also have the opportunity to request one-on-one consults with the Montana ICP/HAI section during active outbreaks of communicable disease. Outbreak consultations help to identify any potential gaps in infection control and prevention practices that could be contributing to the continued transmission of communicable diseases. In 2023, the Montana ICP/HAI section completed 20 outbreak consultations which was a decrease of 39% from the number of outbreak consultations completed in 2022. The majority of outbreak consultations in 2023 were completed with LTCFs, as shown in Figure 11. The Montana ICP/HAI section conducted two outbreak consultations with settings outside of healthcare in 2023. In 2023, 19 of the 20 outbreak consultations in healthcare facilities were for COVID-19 and one outbreak consultation was for norovirus.

FIGURE 11. TOTAL NUMBER OF OUTBREAK CONSULTATIONS COMPLETED BY FACILITY TYPE, 2022-2023.



Skills Fairs

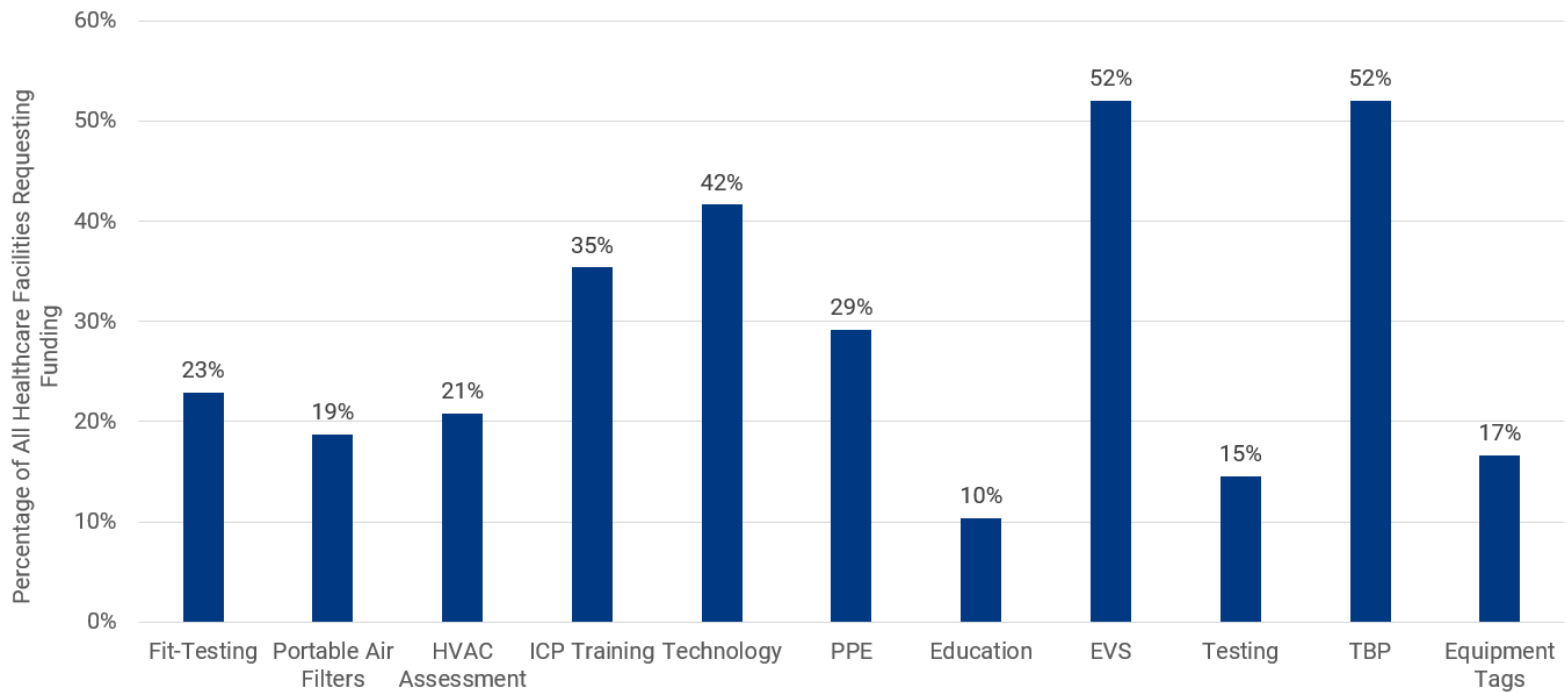
In 2023, the Montana ICP/HAI section offered free skills fairs to healthcare facilities. Skills fairs are an opportunity for healthcare facilities to reinforce practice guidelines and add new knowledge while catering to many learning styles through the use of verbal education and visual aids. Return demonstration can be used at the end of each topic to measure the implementation of knowledge gained. The Montana ICP/HAI section offers skills fairs to facilities as a means to train the trainer, providing facilities with training resources to use in the future for their own staff members. Five skills fairs were conducted in 2023 with over 136 staff being trained as part of these events.

Educational Training and Resources

Facility Grant Funding

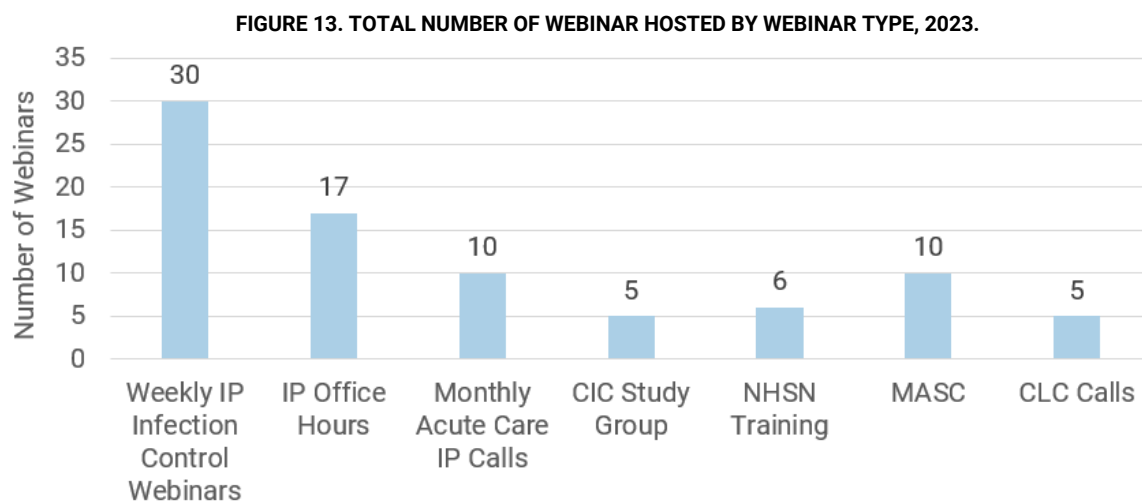
In 2023, the Montana ICP/HAI section offered mini-grants to healthcare facilities (ALFs, CAHs, and LTCFs) using STRIKE grant funding provided by the Centers for Disease and Control and Prevention for improvement of infection control practices as they related to COVID-19. Through the American Rescue Plan Act, CDC, in partnership with CMS, awarded recipient health departments with additional “strike team” funding to improve surge capacity, staff resiliency, and outbreak response. Healthcare facilities could request funding to improve the following areas: fit-testing, portable air filters, HVAC assessment, infection control and prevention (ICP) training, technology, personal protective equipment (PPE), education for staff, EVS, COVID-19 testing supplies, TBP, and clean/dirty equipment tags. One hundred and twelve healthcare facilities (49 LTCF, 46 CAHs, 17 ALFs) were supported by the STRIKE mini-grants. As part of the STRIKE mini-grants, healthcare facilities requested funds the most to improve TBP and EVS, followed by technology and ICP training, as shown in Figure 12. The Montana ICP/HAI section provided over \$1.4 million in mini-grant funds to healthcare facilities in Montana to improve their ICP practices.

FIGURE 12. PERCENTAGE OF HEALTHCARE FACILITIES REQUESTING FUNDING BY SPECIFIED PROJECT FOR BOTH ROUNDS OF THE STRIKE MINI-GRANTS.



Webinars

In 2023, the Montana ICP/HAI Section offered many routine educational webinars and open office hours to provide infection preventionist a space to share, ask questions, and learn about various aspects of infection prevention and control. These included biweekly IP office hours, weekly IP infection control webinars, monthly acute care IP calls, Certificate in Infection Control (CIC) Study Group sessions and NHSN training sessions. The Montana ICP/HAI Section also partnered with the University of Montana Skaggs School of Pharmacy to host a monthly Montana Antimicrobial Stewardship Coalition (MASC) webinar series intended for all those in healthcare that would like to participate in antimicrobial stewardship. In 2023, over 80 educational webinars and open office hours were offered to Montana healthcare facilities in addition to some healthcare facilities from surrounding states, as shown in Figure 13.



Resources Created

The Montana ICP/HAI section works with Montana healthcare facilities and partners to create resources that will be most useful to them. These are designed to address common questions and new or updated CDC guidance. In 2023, the Montana ICP/HAI section created over 20 resources for healthcare facilities. These include the following:

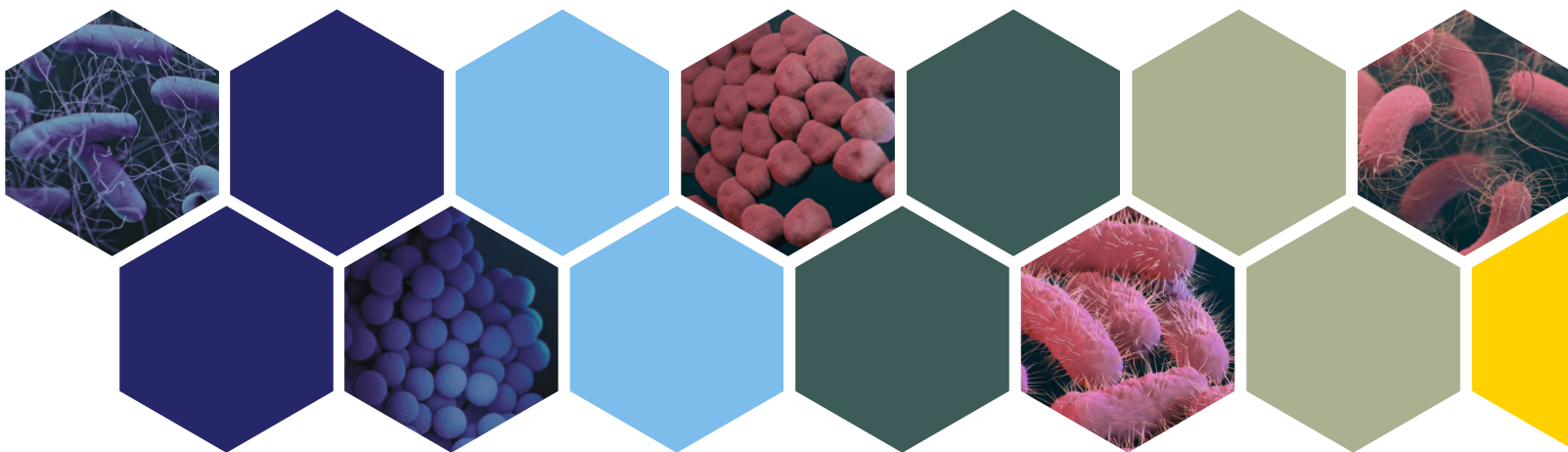
- CRO guides
 - *C. auris* information sheet and consent form
 - CRE information sheet and consent form
 - CRPA information sheet and consent form
 - CRAB information sheet and consent form
 - *C. auris* toolkit for Healthcare Facilities
 - *C. auris* toolkit for Public Health Professionals
- GAS
 - GAS screening/treatment algorithm
 - GAS information sheet and consent form
- Communicable Disease Guide for Healthcare Setting Outbreaks
- Respiratory Outbreak
 - What's a COVID-19 outbreak in a LTCF infographic
 - Colds and Sneezes Cause Diseases infographic
- Facility training materials
 - EVS wipes label
 - What is Cleaning puzzle
 - PPE cards
 - PPE Mishaps with Stan P
 - TBP scenarios
 - Hand hygiene scenarios
 - Aseptic technique cards
- MPX
 - MPX Isolation and Infection Control infographic
 - MPX HCW monitoring toolkit
 - MPX Exposure Risk Assessment for HCW

Acknowledgements

We thank all Montana healthcare facilities for their continued effort to provide the best and safest healthcare for everyone. We would also like to thank our local and tribal public health jurisdictions for their dedication to protecting the public and working with their healthcare partners. Additional gratitude to the Montana Public Health Laboratory for assistance during disease and outbreak investigations as well as technical assistance to hospital laboratories. Lastly, we would like to thank all of our partners for your continued support and collaboration efforts.

References

1. [HAI National Action Plan | HHS.gov](#)
2. [National Healthcare Safety Network](#)
3. [Healthcare-Associated Infections - Community Interface \(HAIC\)](#)
4. [Healthcare Cost and Utilization Project](#)
5. [HCUPanalysisCdiff2019 \(ahrq.gov\)](#)
6. [National HAI Targets & Metrics | HHS.gov](#)
7. [Central Line-associated Bloodstream Infections: Resources for Patients and Healthcare Providers | HAI | CDC](#)
8. [HAIs: Reports and Data | HAIs | CDC](#)
9. [Catheter-associated Urinary Tract Infection Basics | UTI | CDC](#)
10. [C. diff | CDC](#)
11. [About Carbapenem-resistant Enterobacterales | CRE | CDC](#)
12. [2019 Antibiotic Resistance Threats Report | Antimicrobial Resistance | CDC](#)
13. [Core Elements of Hospital Antibiotic Stewardship Programs | Antibiotic Prescribing and Use | CDC](#)



Appendix I: Diseases Reportable to Public Health in Montana, 2023

Montana health care providers are required to report cases of the following conditions to their local health department*. This reporting falls within HIPAA medical privacy exceptions for release of information. Reporting patients with the conditions below does not require patient consent. Reporting enables public health officials to conduct follow up on cases of significance, and to identify outbreaks or emerging health concerns.

Acquired Immune Deficiency Syndrome (AIDS)	Leptospirosis
Anaplasmosis	Listeriosis
Anthrax	Lyme disease
Arboviral disease (including California serogroup, Eastern equine encephalitis, Powassan, St. Louis encephalitis, West Nile Virus, Western equine encephalitis)	Lymphogranuloma venereum
Arsenic poisoning (≥ 70 micrograms per liter total arsenic in urine; or ≥ 35 $\mu\text{g/L}$ methylated plus inorganic arsenic in urine)	Malaria
Babesiosis	Measles (<i>rubeola</i>)
Botulism (including infant botulism)	Meningococcal disease (<i>Neisseria meningitidis</i>)
Brucellosis	Mercury poisoning (≥ 200 $\mu\text{g/L}$ total mercury in urine; or 20 μg elemental mercury/g creatinine in urine; or ≥ 10 $\mu\text{g/L}$ elemental, organic, and inorganic blood mercury levels)
Cadmium poisoning (≥ 5 $\mu\text{g/L}$ total blood cadmium levels; or ≥ 3 $\mu\text{g/L}$ in urine)	Mumps
<i>Candida auris</i>	Pertussis (whooping cough)
Campylobacteriosis	Plague (<i>Yersinia pestis</i>)
Chancroid	Poliomyelitis
<i>Chlamydia trachomatis</i> infection	Psittacosis
Coccidioidomycosis	Q fever (<i>Coxiella burnetii</i>)
Colorado Tick Fever	Rabies, human and animal (including exposure to a human by a species susceptible to rabies infection)
Cryptosporidiosis	Rickettsiosis
Cyclosporiasis	Rubella (including congenital)
Dengue virus	Salmonellosis
Diphtheria	Severe Acute Respiratory Syndrome-associated coronavirus (SARS)
Ehrlichiosis	Shigellosis
<i>Escherichia coli</i> , Shiga toxin-producing (STEC)	Smallpox
Gastroenteritis outbreak	<i>Streptococcus pneumoniae</i> , invasive disease
Giardiasis	Syphilis
Gonococcal infection	Tetanus
<i>Granuloma inguinale</i>	Tickborne relapsing fever
<i>Haemophilus influenzae</i> , invasive disease	Toxic shock syndrome, non-streptococcal
Hansen's disease (leprosy)	Transmissible Spongiform Encephalopathies
Hantavirus Pulmonary Syndrome/infection	Trichinellosis (Trichinosis)
Hemolytic Uremic Syndrome, post-diarrheal	Tuberculosis
Hepatitis A	Tularemia
Hepatitis B, acute, chronic, perinatal	Typhoid Fever
Hepatitis C, acute, chronic	Varicella
Human Immunodeficiency Virus (HIV)	<i>Vibrio cholerae</i> infection (Cholera)
Influenza (including hospitalizations/deaths)	Vibriosis
Lead poisoning (blood levels $\geq$ than 5 micrograms deciliter for children ≤ 13 years of age)	Viral Hemorrhagic fevers
Legionellosis	Yellow Fever

Also reportable is an outbreak of any communicable disease listed in the "Control of Communicable Diseases Manual" that occurs in an institutional or congregate setting and any unusual incident of unexplained illness or death in a human or animal with potential human health implications.

An up-to-date list of Reportable Diseases in Montana is maintained on the State of Montana's website. To view the current list, please visit:
<https://rules.mt.gov/browse/collections/aec52c46-128e-4279-9068-8af5d5432d74/policies/a10d456a-4ef9-43d1-a9a8-93d7b010e4ed>.

*Specific requirements related to reporting, investigation, and control of specific conditions are found in the Administrative Rules of Montana



MONTANA
INFECTION CONTROL AND
HEALTHCARE-ASSOCIATED
INFECTIONS SECTION

Appendix II: Diseases Requiring Confirmation with Public Health in Montana, 2023

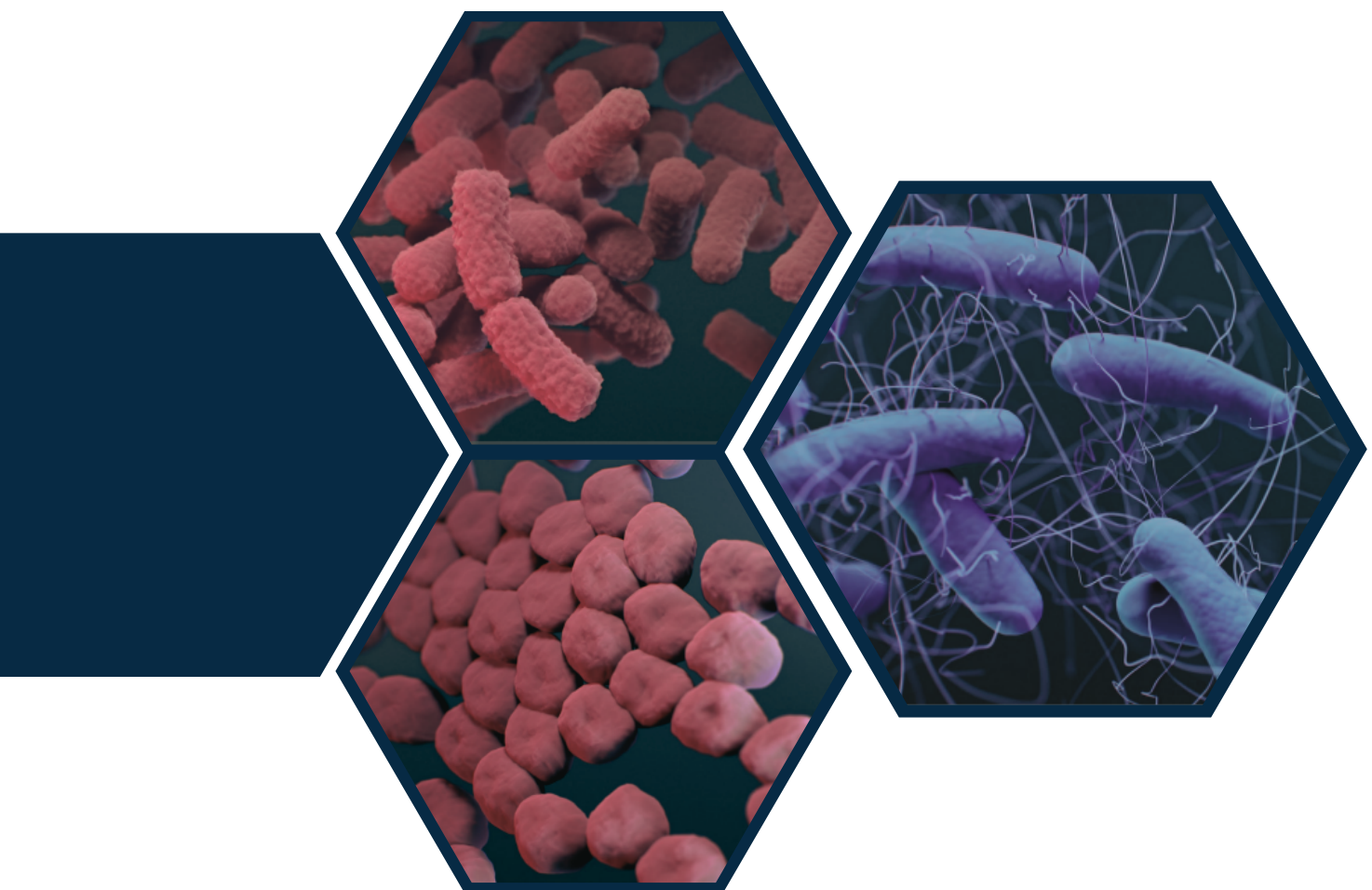
Montana laboratories and all out-of-state reference laboratories are required to send all positive specimens of the following diseases to the Montana Public Health Laboratory for confirmatory testing*. This reporting falls within HIPAA medical privacy exceptions for release of information. Sending specimens identified with the conditions below does not require patient consent. Reporting enables public health officials to conduct follow up on cases of significance, and to identify outbreaks or emerging health concerns.

Anthrax
 Arboviral disease (including California serogroup, Eastern equine encephalitis, Powassan, St. Louis encephalitis, West Nile Virus, Western equine encephalitis)
 Botulism (including infant botulism)
 Brucellosis
Candida auris
 Carbapenem-Resistant Organisms
 Cholera
 Diphtheria
Escherichia coli, Shiga toxin-producing (STEC)
Haemophilus influenzae, invasive disease
 Hantavirus Pulmonary Syndrome/infection
 Influenza
 Listeriosis
 Measles (*rubeola*)
 Meningococcal disease (*Neisseria meningitidis*)
 Plague (*Yersinia pestis*)
 Poliomyelitis, paralytic or non-paralytic
 Rabies (human)
 Rubella (including congenital)
 Salmonellosis (including *Salmonella Typhi* and *Paratyphi*)
 Severe Acute Respiratory Syndrome-associated coronavirus (SARS)
 Shigellosis
 Smallpox
 Trichinellosis (Trichinosis)
 Tuberculosis
 Tularemia
 Vancomycin-intermediate *Staphylococcus aureus* (VISA)
 Vancomycin-resistant *Staphylococcus aureus* (VRSA)
 Vibriosis

In the event of an outbreak, emergence of a communicable disease or a disease of public health importance, specimens must be submitted at the request of the department until a representative sample has been reached as determined by the department.

An up-to-date list of diseases requiring confirmation of disease in Montana is maintained on the State of Montana's website. To view the current list, please visit: <https://rules.mt.gov/browse/collections/aec52c46-128e-4279-9068-8af5d5432d74/policies/6975eb67-3d42-4b65-8016-78e4f9924534>.

*Specific requirements related to reporting, investigation, and control of specific conditions are found in the Administrative Rules of Montana



DEPARTMENT OF
**PUBLIC HEALTH &
HUMAN SERVICES**



MONTANA
**INFECTION CONTROL AND
HEALTHCARE-ASSOCIATED
INFECTIONS SECTION**