SURVEILLANCE AND DATA ANALYSIS FOR LONG-TERM CARE FACILITIES (LTCF)

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What is Surveillance for an Infection Preventionist (IP)?

- Surveillance is an essential component of an effective infection prevention and control program[2] [3]
- Surveillance is a comprehensive method of
  - measuring outcomes and related processes of care
  - analyzing the data
  - providing information to members of the healthcare team to assist in improving those outcomes[1]

Image by rawpixel.com

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Surveillance is Used to…

- Determine baseline and endemic rates of occurrences
- Detect and investigate clusters or outbreaks
- Assess the effectiveness of prevention & control measures
- Target & monitor performance improvement activities
- Observing practice to promote compliance with recommendations & standards

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Why Do IP's Do Surveillance?

Regulatory- CMS §483.80	Part of a good Infection Control Program	Monitor compliance to good infection control practices
Trend infections	Prevent Outbreaks	Resident Safety

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Other Key Terms

- **Baseline:** The number or value used as the basis for comparison [4]
- **Endemic:** The usual presence of a disease or condition in a specific population or geographical area [4]
- **Epidemic:** An excess over the expected incidence of disease within a given geographical area during a particular time[4]
- **Pandemic:** A global outbreak of disease in humans that affects at least two continents and/or exceeds expected rates of morbidity and mortality[4]
- **Outbreak:** An increase in the occurrence of cases of infection or disease over what is expected in a defined setting or group in a specified time period. This is a synonym of epidemic but is used more often when limiting the geographic area. [4]
- **Cluster:** An aggregation of cases grouped by time and place that may be greater than the expected number, whether the expected number is known or not. This is also referred to as a small outbreak. [4]

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WHAT IS REQUIRED FOR SURVEILLANCE FOR LTCF?

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CMS Medicare Requirements for Long-Term Care Facilities

483.80(a)(2)Written standards, policies, and procedures for the program, which must include, but are not limited to:

- A system of surveillance designed to identify possible communicable diseases or infections before they can spread to other persons in the facility

INTENT §483.80(a)(1), (a)(2), (a)(4), (e) and (f)

The intent of this regulation is to ensure that the facility:

- Develops and implements an ongoing infection prevention and control program (IPCP) to prevent, recognize, and control the onset and spread of infection to the extent possible and reviews and updates the IPCP annually and as necessary. This would include revision of the IPCP as national standards change;
- Establishes facility-wide systems for the prevention, identification, reporting, investigation and control of infections and communicable diseases of residents, staff, and visitors.
  - It must include an ongoing system of surveillance designed to identify possible communicable diseases and infections before they can spread to other persons in the facility and procedures for reporting possible incidents of communicable disease or infections [5]

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CMS Medicare Requirements for Long-Term Care Facilities

- §483.80(c) Infection Preventionist participation on quality assessment and assurance committee.
- Infection Preventionist Participation on Quality Assessment and Assurance (QAA) Committee:
  - The IP must be a participant on the facility's QAA committee and report on the IPCP and on incidents (e.g., healthcare-associated infections (HAIs)) identified under the program on a regular basis. Reporting may include, but is not limited to, facility process and outcome surveillance, outbreaks (ongoing and any since the last meeting) and control measures, occupational health communicable disease illnesses (e.g., TB, influenza) and the Antibiotic Stewardship Program (ASP) related to antibiotic use and resistance data. [5]

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TITLE 173 - COMMUNICABLE DISEASES [16]

TITLE 173 - COMMUNICABLE DISEASES

CHAPTER 1 - REPORTING AND CONTROL OF COMMUNICABLE DISEASES

1-001 SCOPE AND AUTHORITY: These regulations apply to the content, control, and reporting of communicable diseases, poisonings, and organisms pursuant to the provisions of Neb. Rev. Stat. §§ 71-501 to 71-514.05, 71-531 to 71-532, and 71-1626.

1-002 DEFINITIONS: When terms are used in 173 NAC 1, the following definitions apply:

Adult HIV Confidential Case Report Form means a CDC form for reporting HIV in adult patients to the Department. The form is available for download on the Department Website at http://dhhs.ne.gov/publichealth/epi/Pages/ReportableDiseases.aspx or by email request at dhhs.epi@nebraska.gov.

Advanced practice registered nurse (APRN) means a registered nurse who holds a current APRN license as a Certified Nurse Midwife, Certified Registered Nurse Anesthetist, Clinical Nurse Specialist, or Nurse Practitioner.

Antibiotic susceptibility registry is the secured online database of susceptibilities of bacterial isolates to antimicrobial drugs reported to the state electronically by laboratories and stored in NEDSS (see NEDSS definition below).

Case means an instance of a suspected or confirmed disease or condition in a person or animal.

CDC means the Centers for Disease Control and Prevention.

CMS means Centers for Medicare and Medicaid

Communicable disease, illness, or poisoning means an illness due to an infectious or malignant agent, which is capable of being transmitted directly or indirectly to a person from an infected person or animal through the agency of an intermediate animal, host, or vector, or through the inanimate environment.

1-004 REPORTABLE DISEASES, POISONINGS, AND ORGANISMS: LISTS AND FREQUENCY OF REPORTS: The following diseases, poisonings, and organisms are declared to be communicable or dangerous or both to the public. Incidents of diseases, poisonings, and organisms must be reported as described in 173 NAC 1-004.01 through 1-004.03, 1-005, and 1-006.

1-004.01 Immediate Reports

1-004.01A The following diseases, poisonings, and organisms must be reported immediately:

Anthrax (Bacillus anthracis) *^

Botulism (Clostridium botulinum) *^

Brucellosis (Brucella abortus ^, B. melitensis ^, and B. suis ^*)

Carbapenamase-Resistant Enterobacteriaceae (suspected or confirmed) **^ (not to include Proteus or Providencia species or Morganella morganii)

Cholera (Vibrio cholerae) ^

Coccidiodomycosis (Coccidioides immitis/posodasii)

Diphtheria (Corynebacterium diphtheriae)

Eastern equine encephalitis (EEE virus) *^

Food poisoning, outbreak-associated

Glanders [Burkholderia (Pseudomonas) mallei *^

Haemophilus influenzae infection (invasive disease only) ^

Hantavirus pulmonary syndrome (Sin Nombre virus)

Hemolytic uremic syndrome (post-diarrheal illness)

Hepatitis A (IgM antibody-positive or clinically diagnosed during an outbreak)

Hepatitis B infection (positive surface antigen tests, e antigen tests, and all IgM core antibody tests, both positive and negative)

Hepatitis E

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NEBRASKA
Good Life. Great Mission.
DEPT. OF HEALTH AND HUMAN SERVICES

MEMO

Jim Pillen, Governor

To: Clinicians, Healthcare Facilities, & Laboratories

From: Tim Tesmer, M.D., Chief Medical Officer

Date: May 29, 2024

RE: Public Health Reporting Updates for Congenital CMV, Alpha-Gal Syndrome, & *Candida auris*

Reporting *Candida auris* in Nebraska: First identified in 2009, *Candida auris* (*C. auris*) poses a significant public health threat due to its emergence as an antimicrobial-resistant yeast. Its resistance to multiple classes of antifungal medicines leaves healthcare providers with limited or no options for treatment, particularly in immunocompromised patients who are more vulnerable to infections. The rapid progression of infections in these patients can lead to severe outcomes contributing to high morbidity and mortality rates. Additionally, *C. auris* demonstrates a unique ability to persist in healthcare environments and colonize patients' skin, facilitating rapid transmission within healthcare settings. This resilience and transmissibility can result in serious and prolonged outbreaks, underscoring the urgent need to make reporting of *Candida auris* mandatory. Such reporting would enable early detection, prompt intervention, and effective control measures to mitigate the spread and impact of this pathogenic fungus. Although still relatively rare in the United States, the incidence of *C. auris* has been steadily increasing nationwide, with 8,131 cases reported in 2022 compared with just 323 cases in 2018. Nebraska, traditionally considered a low-incidence state with no previous detection of *C. auris* transmission, has seen a notable shift in 2024. Nebraska has reported 5 cases of *C. auris* in 2024, indicating a concerning trend of emerging infections even in regions previously considered less affected by this pathogen.

C. auris DNA testing by NAAT (both positive and negative), C. auris isolation and culture, and C. auris antimicrobial susceptibility testing should be immediately reported to the Nebraska Department of Health and Human Services, Division of Public Health, within 24 hours of testing. All positives require reporting regardless of method of reporting. Please see Electronic Lab Reporting (ELR) in Nebraska for onboarding instructions for reporting.

Available at:
https://dhhs.ne.gov/epi%20docs/PHMEMO_5_29_24_MD.pdf

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TITLE 173 - COMMUNICABLE DISEASES [16]

1-004.06 Healthcare Associated Infections (HAIs): Healthcare Associated Infections (HAIs) that are reported by healthcare facilities to CDC's NHSN are reportable. If a healthcare facility provides access to NSHN Healthcare Associated Infection (HAI) data to the department and its local public health department and Healthcare Associated Infections (HAIs) are reported to NHSN on a quarterly basis aligning with the CMS Reporting Schedule, the physician is not required to make the Healthcare Associated Infection (HAI) report. Physicians remain obligated to report Healthcare Associated Infections (HAIs) when access to NHSN data is not provided to the department. In the event of an outbreak, the department has the authority to require Healthcare Associated Infection (HAI) data reports from facilities not currently reporting to NHSN.

NHSN NATIONAL HEALTHCARE SAFETY NETWORK

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Centers for Medicare and Medicaid (CMS) COVID-19 NHSN Reporting Requirements for Nursing Homes [10]

Healthcare Settings	COVID-19 Reporting Data Fields	CMS Reporting Deadlines and Frequency
CMS-certified Long-Term Care Facilities (Skilled Nursing Facilities (SNFs) and/or Nursing Facilities (NFs))	(i) Suspected and confirmed COVID-19 infections among residents and staff, including residents previously treated for COVID-19	Deadlines: **May 17, 2020**: facilities must submit first set of data. CMS will provide facilities with an initial two-week grace period to begin reporting cases in the NHSN system (which ends at 11:59 p.m. on May 24, 2020). Facilities that fail to begin reporting after the third week (by 11:59 p.m. on May 31st) will receive a warning letter reminding them to begin reporting the required information to CDC. **June 13, 2021**: Facilities must begin including vaccination and therapeutic data reporting in NHSN submissions by 11:59 p.m. Frequency: **Facilities must continue submitting their COVID-19 data to NHSN at least weekly, but no later than Sunday at 11:59 p.m., each week.** To be compliant with the new reporting requirements, facilities must submit the data through the NHSN reporting system at least once every seven days. Facilities may choose to submit multiple times a week. CMS is not prescribing which day of the week the data must be submitted, although reporting should remain consistent with data being submitted on the same day(s) each week. The collection period should also remain consistent (e.g., Monday through Sunday). Each Monday, CMS will review the data submitted to assess if each facility submitted data at least once in the previous seven days. The data pulled each Monday will also be used to update the data that is publicly reported.
	(ii) Total deaths and COVID-19 deaths among residents and staff	
	(iii) Personal protective equipment and hand hygiene supplies in the facility	
	(iv) Ventilator capacity and supplies in the facility	
	(v) Resident beds and census	
	(vi) Access to COVID-19 testing while the resident is in the facility	
	(vii) Staffing shortages	
	(viii) Vaccination data for residents and staff and the use of therapeutics for residents (a) total numbers of residents and staff vaccinated, (b) therapeutics administered to residents for treatment of COVID-19	
	(ix) Other information specified by the Secretary	

NHSN NATIONAL HEALTHCARE SAFETY NETWORK

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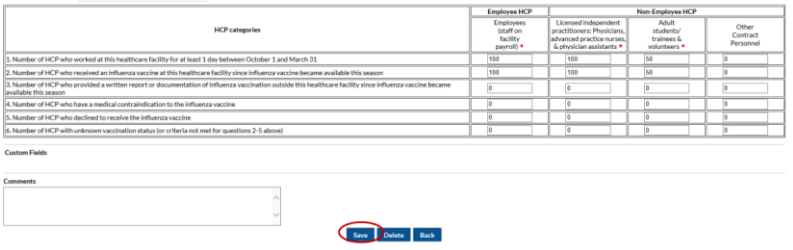
Centers for Medicare and Medicaid (CMS) COVID-19 NHSN Reporting Requirements for Nursing Homes [17, 18, 19]

CMS Reporting Program	HAI Event	Reporting Specifications	Reporting Start Date
Skilled Nursing Facility Quality Reporting (SNFQR) Program	Healthcare Personnel COVID-19 Vaccination	All Healthcare Personnel	October 2021
	Healthcare Personnel Influenza Vaccination	All Healthcare Personnel	October 2022

Entering HCP Influenza Vaccination Data



HCP categories	Employee HCP	Non-Employee HCP		
	Employees (staff on facility payroll) *	Licensed Independent practitioners: Physicians, advanced practice nurses, & physician assistants *	Adult students/ trainees & volunteers *	Other Contract Personnel
1. Number of HCP who worked at this healthcare facility for at least 1 day between October 1 and March 31	100	100	50	0
2. Number of HCP who received an influenza vaccine at this healthcare facility since influenza vaccine became available this season	100	100	50	0
3. Number of HCP who provided a written report or documentation of influenza vaccination outside this healthcare facility since influenza vaccine became available this season	0	0	0	0
4. Number of HCP who have a medical contraindication to the influenza vaccine	0	0	0	0
5. Number of HCP who declined to receive the influenza vaccine	0	0	0	0
6. Number of HCP with unknown vaccination status (or criteria not met for questions 2-5 above)	0	0	0	0

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Comments

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COMPONENTS OF SURVEILLANCE

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Components of Surveillance

- Surveillance Methods
- Collecting Relevant Data
- Managing Data
- Analyzing and Interpreting Data
- Communicating Result

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ELEMENTS OF AN EFFECTIVE SURVEILLANCE PROGRAM

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Elements of an Effective Surveillance Program

- Methodology (total vs. targeted vs a combination)
- Population to be served- who has the greatest risk for infection/adverse outcome
- Identify the Events to Monitor
- Define the Time Period (one quarter, 6 months, year, etc.)
- Case definitions

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Surveillance Methods

Total (or Whole House) Surveillance:

- All HAIs are monitored in the entire population of a healthcare facility

Targeted

- Focuses on particular care units (e.g., rehab patients vs. memory care)
- Infections related to medical devices (e.g., intravascular and urinary catheters)
- Organisms of epidemiological significance (e.g., MRSA, C-diff, etc.)

Combination of both

- Use a combination of targeted and modified total house surveillance[4]

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Defining the Population to be Served

- Every facility should look at the population that it serves, as well identify those that have the greatest risk for infection or other adverse outcome [1] [8]
- Evaluate the resident population
  - Resident Types
    - Memory Care/Dementia
    - Skilled Care
    - Ventilator Units
    - Short-Term Rehab
- Healthcare Services Provided
  - Rehabilitation
  - Long-term Care (LTC)
  - Long-term Acute Care (LTAC)
  - Assisted Living
  - Independent Living
- Conditions/Diseases Present in the Population [4]

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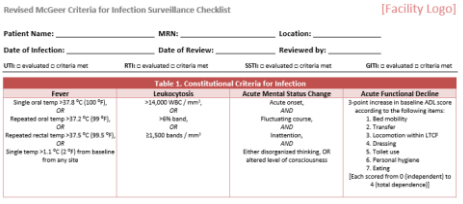
Identify the Events to Monitor

- It is common to monitor high-volume, high-risk events in a specific population
- An effort should be made to select events that have validated, nationally available benchmark data that can be used for meaningful comparison
  - Examples:
    - CDC's National Healthcare Safety Network (NHSN) Long Term Care Criteria to define infections
    - Advanced Copy updated McGeer criteria [4] [13]



Revised McGeer Criteria for Infection Surveillance Checklist [Facility Logo]

Patient Name: _____ MRN: _____ Location: _____

Date of Infection: _____ Date of Review: _____ Reviewed by: _____

UTIs ☐ evaluated ☐ criteria met RTIs ☐ evaluated ☐ criteria met SSTIs ☐ evaluated ☐ criteria met GITIs ☐ evaluated ☐ criteria met

Table 1. Constitutional Criteria for Infection

Fever	Leukocytosis	Acute Mental Status Change	Acute Functional Decline
Single oral temp >37.8 °C (100 °F), OR Repeated oral temp >37.2 °C (99 °F), OR Repeated rectal temp >37.5 °C (99.5 °F), OR Single temp >1.1 °C (2 °F) from baseline from any site	>14,000 WBC / mm³, OR >6% band, OR ≥1,500 bands / mm³	Acute onset, AND Fluctuating course, AND Inattention, AND Either disorganized thinking, OR altered level of consciousness	3-point increase in baseline ADL score according to the following items: 1. Bed mobility 2. Transfer 3. Locomotion within LTCF 4. Dressing 5. Toilet use 6. Personal hygiene 7. Eating [Each scored from 0 (independent) to 4 (total dependence)]

Revised McGeer Criteria for Infection Surveillance Checklist

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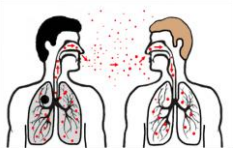
Identify the Events to Monitor

- Monitor events that have the potential to provide information that can be used to improve outcomes and infection prevention practices.
  - Examples:
    - HAIs (e.g., bloodstream, urinary tract, pneumonia, conjunctivitis, upper respiratory tract, or gastroenteritis)
    - Infection or colonization with a specific organism (e.g., *C. difficile*, MRSA, VRE, or other MDROs, respiratory syncytial virus [RSV] or rotavirus)
    - Employees out ill with communicable disease (e.g., COVID, Influenza, Norovirus, etc.)
    - Sharps injuries and communicable disease or blood/body fluid exposures in healthcare personnel
    - Tuberculin skin test conversion rates in healthcare personnel or residents
    - Influenza immunization rates in personnel, residents, or patients [4]



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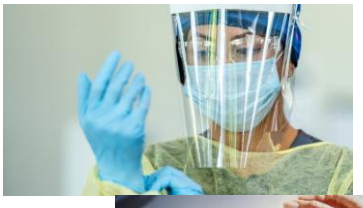
Identify the Events to Monitor continued

- Examples of Process Events include the following:
  - Personnel compliance with infection prevention protocols, such as:
    - Standard precautions
    - Isolation precautions
    - Central line maintenance, and removal
    - Urinary catheter insertion, care, and removal
    - Safe injection and medication handling practices
    - Tuberculin skin testing
    - Hand hygiene
    - Environmental cleaning and disinfection
    - Communicable disease reporting
    - Antimicrobial prescribing and administration
    - Installing and maintaining barriers during construction and renovation projects [4]



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Identify the Events to Monitor continued

- Examples of other events of significance that may be monitored include the following:
  - Occurrence of reportable diseases and conditions
  - Communicable and potentially communicable diseases in personnel
  - Organisms, test results, or syndromes indicative of a widespread outbreak, pandemic or bioterrorist event
  - Admission of a patient or resident known to be infected or colonized with an MDRO [4]

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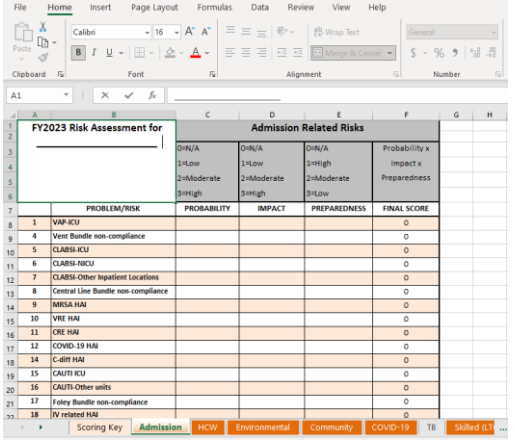
Identify the Events to Monitor continued

- Determine what is required to monitor for your organization
  - Example: CMS requires that hospitals report CLABSI, CAUTI, SSI: COLO, SSI HYST, MRSA Bacteremia, C. Diff, and Healthcare Personnel Influenza Vaccination to NHSN
- Add events that are a higher-risk as determined by your risk assessment



FY2023 Risk Assessment for _____

	PROBLEM/RISK	PROBABILITY	IMPACT	PREPAREDNESS	FINAL SCORE
		Admission Related Risks			
		0=N/A 1=Low 2=Moderate 3=High	0=N/A 1=Low 2=Moderate 3=High	0=N/A 1=High 2=Moderate 3=Low	Probability x Impact x Preparedness
1	VAP-ICU				0
4	Vent Bundle non-compliance				0
5	CLABSI-ICU				0
6	CLABSI-NICU				0
7	CLABSI-Other Inpatient Locations				0
8	Central Line Bundle non-compliance				0
9	MRSA HAI				0
10	VRE HAI				0
11	CRE HAI				0
12	COVID-19 HAI				0
14	C-diff HAI				0
15	CAUTI ICU				0
16	CAUTI-Other units				0
17	Foley Bundle non-compliance				0
18	IV related HAI				0

Scoring Key | Admission | HCW | Environmental | Community | COVID-19 | TB | Skilled (LT

Risk assessment template courtesy of CHI Health Infection Prevention

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Prioritize Your Surveillance

- Infections that <u>should</u> be included in routine surveillance
  - Evidence of transmissibility in a healthcare setting
    - Example: COVID outbreaks
  - Viral respiratory tract infections, viral gastroenteritis, and viral conjunctivitis
  - Clinically significant cause of morbidity or mortality
  - Pneumonia, urinary tract infection, gastrointestinal tract infections including *Clostridium difficile*, and skin and soft tissue infections
  - Specific pathogens causing serious outbreaks
  - Any invasive group A *Streptococcus* infection, acute viral hepatitis, norovirus, scabies, influenza **(one case investigate)** [13]

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Prioritize Your Surveillance

- Additional infections that <u>could</u> be considered in surveillance
  - Infections with limited transmissibility and preventability in a healthcare setting
  - Ear and sinus infections, fungal oral and skin infections, and herpetic skin infections
- Infections for which other accepted definitions should be applied in LTCF surveillance (may apply to only specific at-risk residents)

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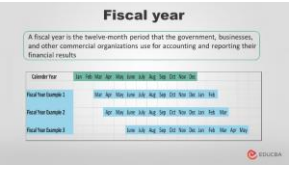
Define the Time Period

- Time periods can be any of the following:
  - Yearly/Annually
    - Calendar Year (January to December)
    - Fiscal Year (July 1 to June 30th)
    - Other Performance Period defined by your organization
  - Quarterly
  - Monthly
- Surveillance data needs to consistently collected
- It is difficult to interpret rates for events that rarely occur and procedures that are infrequently performed. [4]



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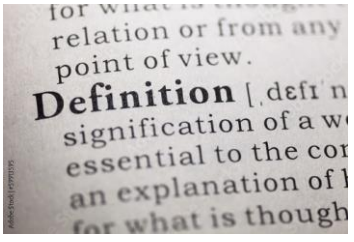
Case Definition



- To accurately trend surveillance data over time within a facility, or compare rates between facilities, surveillance criteria (i.e., case definitions) must be consistently used to determine the presence of an HAI, occurrence of an event, or compliance with a process.
- If a case definition is changed, this should be noted in the surveillance report because the number of cases identified will likely change and the rate will be affected. [4]

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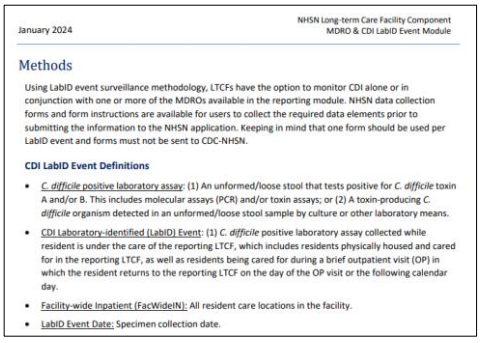
Case Definition continued

- Use criteria that reflect generally accepted definitions of the disease or event being monitored.
- Criteria have been published for defining HAIs in a variety of healthcare settings, including:
  - LTC
    - NHSN Long-term Care Facilities (LTCF) Component [12]
    - Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria[13]



January 2024 — NHSN Long-term Care Facility Component — MDRO & CDI LabID Event Module

Methods

Using LabID event surveillance methodology, LTCFs have the option to monitor CDI alone or in conjunction with one or more of the MDROs available in the reporting module. NHSN data collection forms and form instructions are available for users to collect the required data elements prior to submitting the information to the NHSN application. Keeping in mind that one form should be used per LabID event and forms must not be sent to CDC-NHSN.

CDI LabID Event Definitions

- *C. difficile* positive laboratory assay: (1) An unformed/loose stool that tests positive for *C. difficile* toxin A and/or B. This includes molecular assays (PCR) and/or toxin assays; or (2) A toxin-producing *C. difficile* organism detected in an unformed/loose stool sample by culture or other laboratory means.
- CDI Laboratory-identified (LabID) Event: (1) *C. difficile* positive laboratory assay collected while resident is under the care of the reporting LTCF, which includes residents physically housed and cared for in the reporting LTCF, as well as residents being cared for during a brief outpatient visit (OP) in which the resident returns to the reporting LTCF on the day of the OP visit or the following calendar day.
- Facility-wide Inpatient (FacWideIN): All resident care locations in the facility.
- LabID Event Date: Specimen collection date.

https://www.cdc.gov/nhsn/pdfs/ltc/ltcf-labid-event-protocol_current.pdf

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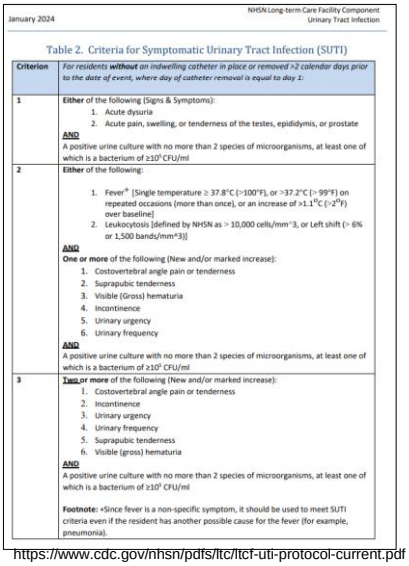
Case Definition continued



January 2024 — NHSN Long-term Care Facility Component — Urinary Tract Infection

Table 2. Criteria for Symptomatic Urinary Tract Infection (SUTI)

Criterion	*For residents **without** an indwelling catheter in place or removed >2 calendar days prior to the date of event, where day of catheter removal is equal to day 1:*
1	**Either** of the following (Signs & Symptoms): 1. Acute dysuria 2. Acute pain, swelling, or tenderness of the testes, epididymis, or prostate **AND** A positive urine culture with no more than 2 species of microorganisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml
2	**Either** of the following: 1. Fever* [Single temperature ≥ 37.8°C (>100°F), or >37.2°C (> 99°F) on repeated occasions (more than once), or an increase of >1.1°C (>2°F) over baseline] 2. Leukocytosis [defined by NHSN as > 10,000 cells/mm^3, or Left shift (> 6% or 1,500 bands/mm^3)] **AND** **One or more** of the following (New and/or marked increase): 1. Costovertebral angle pain or tenderness 2. Suprapubic tenderness 3. Visible (Gross) hematuria 4. Incontinence 5. Urinary urgency 6. Urinary frequency **AND** A positive urine culture with no more than 2 species of microorganisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml
3	**Two or more** of the following (New and/or marked increase): 1. Costovertebral angle pain or tenderness 2. Incontinence 3. Urinary urgency 4. Urinary frequency 5. Suprapubic tenderness 6. Visible (gross) hematuria **AND** A positive urine culture with no more than 2 species of microorganisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml **Footnote:** *Since fever is a non-specific symptom, it should be used to meet SUTI criteria even if the resident has another possible cause for the fever (for example, pneumonia).

https://www.cdc.gov/nhsn/pdfs/ltc/ltcf-uti-protocol-current.pdf

- Individuals who conduct surveillance activities and identify HAI cases must apply surveillance criteria precisely.
- Criteria used to define a case for surveillance purposes may be different than criteria used clinically for diagnosis and treatment.
- Surveillance definitions, such as those used in the NHSN, were developed for epidemiologic surveillance and not for clinical diagnosis.
  - Example:
    - NHSN LTC UTI definition versus a positive culture result with no clinical symptoms [12]

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DATA COLLECTION

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How to Collect the Data Elements

- The data elements that should be collected depend on the event being monitored and the statistical measures used to analyze the data.
- To use time and personnel resources efficiently, data collection should be limited only to those elements that are needed to identify a case and determine whether the case criteria are met for the condition or event being studied. [4]

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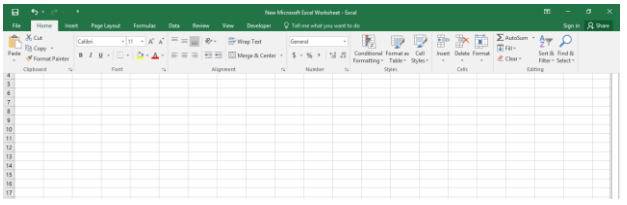
How to Collect the Data Elements

- Ensure that personnel who are responsible for collecting and managing surveillance data have adequate training in:
  - reviewing medical records
  - interpreting clinical notes
  - applying standardized criteria for identifying cases
  - using appropriate statistical and risk adjustment methods
- Personnel should also be proficient in using computer tools and technology (especially electronic records, spreadsheets, and databases) to collect, enter, store, manage, and analyze data [1] [2] [3]



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Data Elements to Collect

Case Information:

- Case name
- Sex
- Age
- Unique identifier (e.g.; medical record or account number)
- Unit or location in the facility
- Physician name and service
- Date of admission
- Date of onset of infection
- Type of infection
- Date of discharge, transfer, or death [4]

Case Definition Information:

- Results of laboratory and diagnostic tests specified in the case definition
- Dates lab or diagnostic test performed
- Sites and dates cultured, and organisms isolated;
- Antibiotic susceptibility of significant isolates
- Clinical signs and symptoms specific for the infection being monitored [4]

Risk Factors Being Monitored

- Host factors such as underlying conditions and diseases
- surgical procedure and date performed
- Surgeon
- Use of intravascular catheters
  - date of insertion
  - duration of use (vascular catheter-days)
  - catheter type and body site;
- Use of a urinary catheter
  - date of insertion
  - duration of use (urinary catheter-days)
- Mechanical ventilation and dates and duration of use (ventilator-days) [4]

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Sources of Surveillance Data

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DATA ANALYSIS

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Determine Methods Data Analysis

- Before data collection is initiated, the statistical measures that will be used to analyze the data must be determined so the requisite data can be collected.
- If rates or ratios will be calculated, the values corresponding to each numerator and denominator must be defined
  - the appropriate data needed to calculate each rate or ratio must be collected.
- Whenever possible, data should be expressed as rates or ratios that are calculated using the same methodology as a nationally validated surveillance system. This allows an organization to compare its rates with another organization or a recognized benchmark.
  - Example: NHSN benchmarks [15]

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Rates and Ratios

- **Rate:** an expression of the frequency with which an event occurs in a defined population per unit of time
  - In healthcare surveillance, it is often used more casually to refer to proportions that are not truly rates (e.g., attack rate or incidence density rate)
- **Ratio:** the value obtained by dividing one quantity by another [15]

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Example: Device-Related Rate

CA-SUTI (Catheter Associated-Symptomatic UTI) incidence rate per 1,000 catheter days [11]

$$\frac{\text{Number of CA} - \text{SUTI Events}}{\text{Total catheter} - \text{days}} x\ 1{,}000$$

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Example: Device Utilization Ratio

Urinary Catheter Utilization Ratio [11]

$$\frac{\text{Total urinary catheter} - \text{days}}{\text{Total resident} - \text{days}}$$

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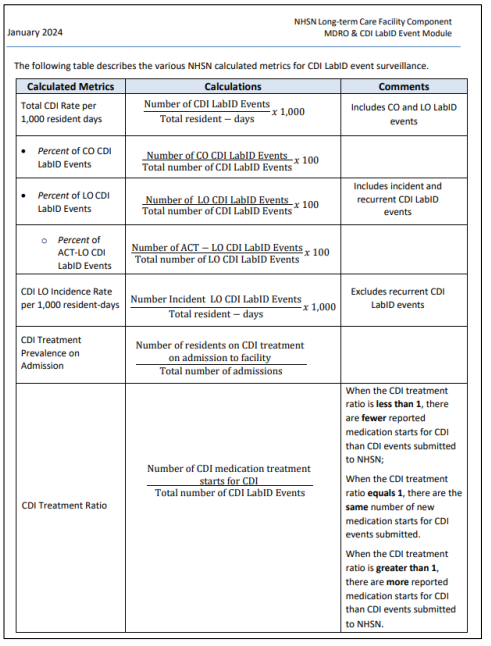
Example: CDI LabID Event Calculations



January 2024

NHSN Long-term Care Facility Component
MDRO & CDI LabID Event Module

The following table describes the various NHSN calculated metrics for CDI LabID event surveillance.

Calculated Metrics	Calculations	Comments
Total CDI Rate per 1,000 resident days	$\frac{\text{Number of CDI LabID Events}}{\text{Total resident} - \text{days}} x\ 1{,}000$	Includes CO and LO LabID events
• *Percent* of CO CDI LabID Events	$\frac{\text{Number of CO CDI LabID Events}}{\text{Total number of CDI LabID Events}} x\ 100$	
• *Percent* of LO CDI LabID Events	$\frac{\text{Number of LO CDI LabID Events}}{\text{Total number of CDI LabID Events}} x\ 100$	Includes incident and recurrent CDI LabID events
○ *Percent* of ACT-LO CDI LabID Events	$\frac{\text{Number of ACT} - \text{LO CDI LabID Events}}{\text{Total number of LO CDI LabID Events}} x\ 100$	
CDI LO Incidence Rate per 1,000 resident-days	$\frac{\text{Number Incident LO CDI LabID Events}}{\text{Total resident} - \text{days}} x\ 1{,}000$	Excludes recurrent CDI LabID events
CDI Treatment Prevalence on Admission	$\frac{\text{Number of residents on CDI treatment on admission to facility}}{\text{Total number of admissions}}$	
CDI Treatment Ratio	$\frac{\text{Number of CDI medication treatment starts for CDI}}{\text{Total number of CDI LabID Events}}$	When the CDI treatment ratio is **less than 1**, there are **fewer** reported medication starts for CDI than CDI events submitted to NHSN; When the CDI treatment ratio **equals 1**, there are the **same** number of new medication starts for CDI events submitted. When the CDI treatment ratio is **greater than 1**, there are **more** reported medication starts for CDI than CDI events submitted to NHSN.

https://www.cdc.gov/nhsn/pdfs/ltc/ltcf-labid-event-protocol_current.pdf

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INTERPRETING AND COMMUNICATING DATA

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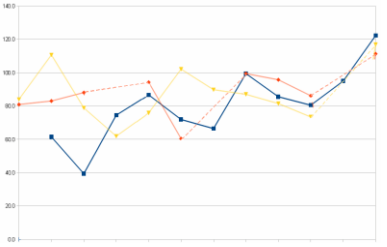
What Do You Do With the Data?

- Look for trends
- Communicate Data
- Identify Gaps in Practice
  - Compare Practice to National Standards or Guidelines
  - PDSA cycle
- Implement Changes
- Monitor, Track and Report Effect of Interventions



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Interpreting Data

- A high rate does not necessarily indicate a problem.
  - intensity of surveillance
  - intrinsic risk uncontrolled
  - small denominator
    - Sample Size usually not less than 25
    - surgical procedures or devices at least 50

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Communicating Data

- What to Report
- How to Report
  - Line List
  - Chart
    - Pie Chart
  - Graph
    - Line Graph
    - Control Chart
  - Bar Graph

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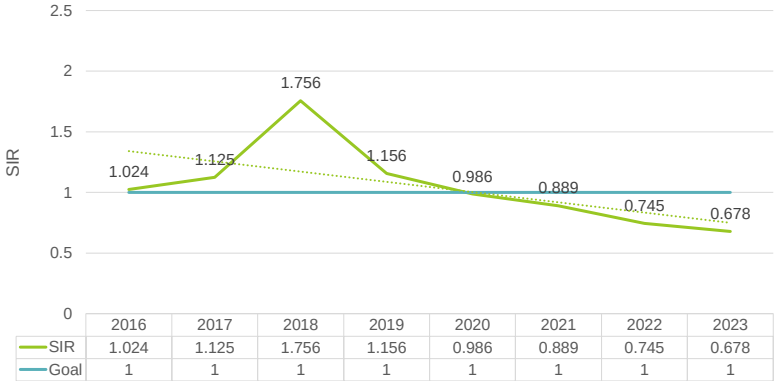
Example CDI SIR by Year



	2016	2017	2018	2019	2020	2021	2022	2023
SIR	1.024	1.125	1.756	1.156	0.986	0.889	0.745	0.678
Goal	1	1	1	1	1	1	1	1

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Example Chart: Healthcare Facility Onset Incidence Rate by Department

General LTCF Healthcare-Onset CDI Rates 2024			
location	HO-CDI Cases	Patient Days	CDI Rate
Hall A	3	5549	5.41
Hall B	1	3587	2.79
Rehab	0	2548	0.00
Memory Care	1	4879	2.05
Short Stay	2	7894	2.53

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Example: Year End Summary

Surveillance event	2022	Desired goal 2023	2023	Goal Met	Continuing 2024	New goal
Hand Hygiene	85%	90%	90%	Yes	Yes	95%
Isolation compliance	76%	90%	80%	No	Yes	85%
UTI	SIR 0.85	SIR 0.56	0.76	No	Yes	0.56
Employee flu vaccination	95%	98%	99%	Yes	Yes	100%

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Summary

- Keep it Stable
  - Data must be comparable
- Calculate rates and statistical tests that are understood
- Internal and External Comparisons
  - Differences between units, surgeons, years, other hospitals, national rates
- Keep Graphs and Diagrams Simple
  - They are a tool, not the goal
- Know when to intervene- do we have a cluster or an outbreak

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NHSN RESOURCES

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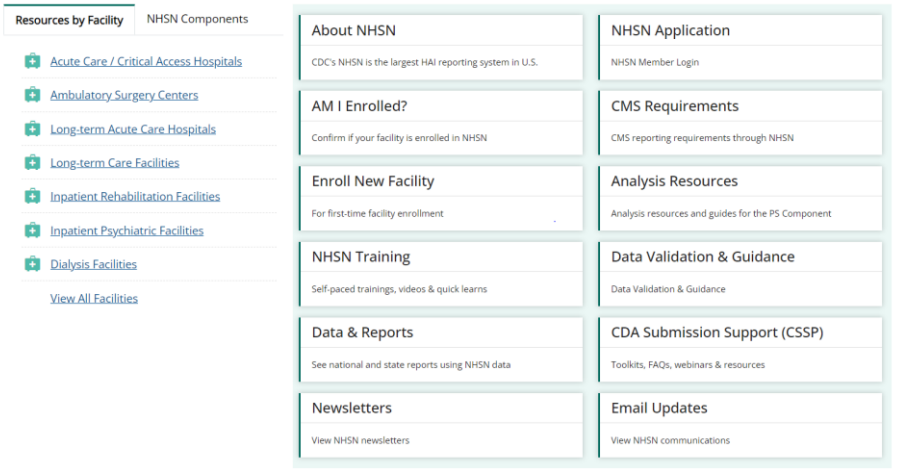
NHSN



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

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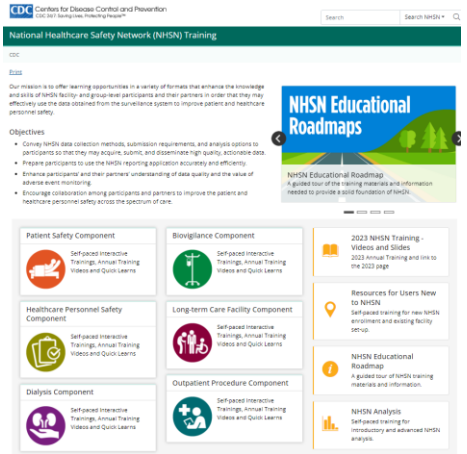
How Do I learn all this?



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Frequently Asked Questions

- Does anyone check this data?
- What are my resources if I cannot tell an infection?
- What happens if I am wrong?

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