### Hospital Acquired Clostridium difficile infection rate

<table>
<thead>
<tr>
<th><strong>Name and Definition</strong></th>
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<tbody>
<tr>
<td><strong>Full Name</strong></td>
<td>Hospital Acquired Clostridium difficile Infection rate: all new Clostridium difficile Infection (CDI) cases that develop while the person is in an acute care hospital in Alberta: incident cases per 10,000 patient-days</td>
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<tr>
<td><strong>Short Name</strong></td>
<td>Hospital Acquired Clostridium difficile infection rate</td>
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<tr>
<td><strong>Definition</strong></td>
<td>The incidence of newly reported cases of CDI acquired by patients in acute care and tertiary acute rehabilitation hospitals in Alberta: incident cases per 10,000 patient-days</td>
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<tr>
<td><strong>Domain</strong></td>
<td>Health Services Delivery</td>
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<thead>
<tr>
<th><strong>Dimension</strong></th>
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<tbody>
<tr>
<td><strong>Acceptability</strong></td>
<td>Efficiency</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Effectiveness</strong></td>
<td>Accessibility</td>
</tr>
<tr>
<td>No</td>
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| **Category of Measure** | Strategic |
| **Type of Measure**     | Outcome Measure |

### Context

**Business Context**
CDI is reported to the Surveillance and Assessment Branch at Alberta Health as well as to the provincial Infection Prevention and Control (IPC) Surveillance Committee and the Provincial IPC Committee.

AHS Health Plan and Business Plan 2014-2017

**Rationale**
Province-wide CDI reporting was identified as a major Infection Prevention and Control indicator for Accreditation in 2010. All patients are monitored for CDI while in hospital and individuals with a CDI are placed on isolation precautions until their diarrhea resolves.

Alberta Health Services (AHS) and Covenant Health (CH) has chosen to focus on hospital-acquired CDI rate which reflects transmission and/or development of CDI in hospital.

The use of this measure for CDI was approved by the Provincial Infection Prevention and Control Surveillance Committee (December 2011) and the Provincial IPC Committee (January 2012) as the most valid and reliable measure of Clostridium difficile infections in Alberta Health Services and Covenant Health (AHS/CH) hospitals.

**Notes for Interpretation**
Hospital-acquired CDI Rate – all newly identified cases of CDI that developed while a patient was in an acute care and tertiary acute rehabilitation hospital. The patient must be admitted for longer than 72 hours before case can be classified as hospital-acquired.

Includes all acute care and acute tertiary rehabilitation sites including Covenant Health facilities. Excludes Lloydminster and hospitals with no inpatient discharges.

**Organizational Strategy**
Alberta Health’s Infection Prevention and Control Strategy has actions to support province-wide surveillance of healthcare-associated infections including CDI. CDI is monitored to decrease CDI related morbidity and mortality and patient length of stay.

**Benchmark Comparisons**
National or International comparisons available:

The AHS/CH Surveillance protocol is based on the CNISP CDI Surveillance Protocol; however, there are subtle differences in the interpretation of protocols used nationally.

Alberta has comprehensive capture of patients as they move from hospital to hospital in the province while in Canadian Nosocomial Infection Surveillance Program (CNISP) hospitals cases of CDI disappear from the surveillance program when the patients are discharged from that hospital. In addition, the laboratory testing for CDI is standardized throughout the province.

The AHS/CH hospital-acquired CDI rates can be compared with rate from the CNISP. This reflects hospital acquisition. They have a reported a CDI rate of 6.0 cases per 10,000 patient-days for 2011 (CNISP – personal communication) in Canada and 5.7 for Western Canada.

**Cited References**
Canadian Nosocomial Infection Surveillance Program (CNISP). Public Health Agency of Canada.
**Performance Measure Definition**


<table>
<thead>
<tr>
<th>Technical Specifications</th>
<th>Metric</th>
<th>New cases per 10,000 patient-days</th>
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<tbody>
<tr>
<td><strong>Preferred Display Format</strong></td>
<td>99.9</td>
<td></td>
</tr>
<tr>
<td><strong>Numerator</strong></td>
<td>Number of new reported cases of Clostridium difficile infection (CDI) acquired by patients in acute care and acute tertiary rehabilitation hospitals in Alberta.</td>
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</table>

**Inclusion Criteria for Numerator**

A patient is identified as a CDI case if > 1 year of age and:

- Patient has diarrhea AND laboratory confirmation of a positive toxin for C. difficile (toxin assay, PCR or other testing) OR
- Has fever WITH abdominal pain and/or ileus AND laboratory confirmation of a positive toxin for C. difficile (toxin assay, PCR or other testing) OR
- Physician diagnosis based on pseudomembranes on endoscopy (sigmoidoscopy or colonoscopy) or histology/pathology

All identified cases require laboratory confirmation of CDI plus the presence of signs and symptoms within AHS/CH. This confirmation is done at the reporting site.

Primary CDI Infection - Only Primary episodes of CDI are included in the surveillance.

- first episode of CDI ever experienced, OR
- re-infection

Re-infections with CDI

Subsequent CDI episode of a hospitalized patient who previously had CDI. A case is re-infected if >= 1 year of age and:

- the patient meets the criteria for a CDI case AND
- the new CDI episode occurs >8 weeks after the first diagnosis date of C. difficile AND
- symptoms resolved, and this is a new episode following the first infection, and there have not been intermittent recurrences of symptoms during the 8 weeks.

**Exclusion Criteria for Numerator**

Patient is < 1 year of age.

Eight weeks is used as an arbitrary cut-off value used to differentiate relapse case from a new episode (re-infection) of CDI. Patients with CDI do not undergo repeated testing until a negative test as a "test of cure" following treatment.

A relapse case from CDI is a patient who is >= 1 year of age and has:

- New symptoms < 8 weeks of the diagnosis date of the previous CDI episode. OR
- Symptoms not resolved within the 8 weeks of the diagnosis date of the previous CDI episode.

**Data Source(s) for Numerator**

- Diagnostic Laboratories
- Patient Charts/kardex
- Electronic Health Records
- Pharmacy records

The patient symptoms and laboratory results typically define a case. The use of pharmacy and other health records help to classify the cases as hospital or community acquired.

**Refresh Rate for Numerator**

Quarterly
### Data Steward for Numerator
Alberta Health Services (AHS) and Covenant Health (CH) Infection Prevention and Control

### Denominator
Number of patient-days in acute care and acute tertiary rehabilitation hospitals in Alberta

#### Inclusion Criteria for Denominator
All patient-days for patients \( \geq 1 \) year of age (if possible)

#### Exclusion Criteria for Denominator
Patient-days for children < 1 year of age (if possible)

#### Data Source(s) for Denominator
This is hospital admissions information systems via Alberta Health Services Data Repository for Reporting (AHSDRR)

#### Refresh Rate for Denominator
Quarterly

#### Data Steward for Denominator
Data Integration, Measurement and Reporting, Alberta Health Services.

### Technical Notes
The methodology is based on the AHS/CH Surveillance of Clostridium difficile infection (CDI) Surveillance Protocol – August 2011.

### Calculation
\[
\text{Total Number of new hospital-acquired Clostridium difficile infections identified} / \text{number of patient-days} \times 10,000
\]

### Relationship to Other Indicators
Not applicable

### Level of Reporting

<table>
<thead>
<tr>
<th></th>
<th>National</th>
<th>Provincial</th>
<th>Zone</th>
<th>Site</th>
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<tbody>
<tr>
<td>Reporting</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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### Frequency of Reporting

<table>
<thead>
<tr>
<th>Other Reporting Frequency</th>
<th>Annually</th>
<th>Quarterly</th>
<th>Monthly</th>
<th>Other</th>
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<tbody>
<tr>
<td>Reporting Frequency</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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### Limitations
The definitions and methodology used for CDI surveillance are standardized to those used by the Canadian Nosocomial Infection Surveillance Program (CNISP).

Capture is close to 100% because patients must have a positive laboratory test using the two-step algorithm, including first the detection of glutamate dehydrogenase (GDH) as a screening method and second the detection of toxins using polymerase chain reaction (PCR) as a confirmatory method to be classified as having CDI. All laboratory positive cases for Clostridium difficile occurring in hospital are investigated to determine if the patient has signs and symptoms of CDI. Each case is assessed by an Infection Control Professional as they occur and those patients with signs and symptoms of CDI are placed on isolation precautions. All positive culture reports are either printed in the IPC office or are available through the site laboratory systems. The validity and reliability of the data presented are very high.

Cases are reviewed and submitted from the individual site Infection Prevention and Control (IPC) Programs within 15 days after the end of the 30 day outcome observation period to IPC Surveillance through a common provincial data platform. Data are reviewed, validated and compiled by the IPC Surveillance Team. Reports are approved by the provincial IPC Surveillance Committee and the Provincial Infection Prevention and Control Committee prior to publication.

Only cases of CDI for which no laboratory specimen was collected would be missed. Standard practice is to collect and submit specimens on any patients who have unexplained diarrhea.

### Planning Documents

#### Reference Documents

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<thead>
<tr>
<th>Name</th>
<th>Business Planning Document URL</th>
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