In-Hospital Sepsis

Name: In-Hospital Sepsis
Short/Other Names: Not applicable
Description: The risk-adjusted rate of sepsis that is identified after admission. For further details, please see the General Methodology Notes.
Interpretation: A lower rate for this indicator is desirable.
HSP Framework Dimension: Health System Outputs: Safe
Areas of Need: Getting Better
Geographic Coverage: All provinces/territories
Reporting Level/Disaggregation: National, Province/Territory, Region, Facility

Indicator Results
Identifying Information
Name: In-Hospital Sepsis
Short/Other Names: Not applicable
Indicator Description and Calculation
Description: The risk-adjusted rate of sepsis that is identified after admission. For further details, please see the General Methodology Notes. This indicator measures the rate of in-hospital sepsis per 1,000 discharges.
Calculation: 2 logistic regression models were built separately for children (younger than 18 years) and adults (18 years and older) to calculate the risk-adjusted results. Risk-adjusted rate = Observed cases ÷ Expected cases × Canadian average
Unit of analysis: Single admission

Geographic Assignment
Place of service
Calculation: Rate - Rate—per 1,000

Type of Measurement
Calculation: Adjustment Applied
Method of Adjustment
Logistic regression

Description: Number of discharges from an acute care institution within a fiscal year
Inclusions:
1. Sex recorded as male or female
2. Length of stay of 2 days and longer

Exclusions:
1. Records with invalid age
2. Records with invalid admission or discharge dates
3. Mental illness (major clinical category [MCC] of Mental Diseases and Disorders [MCC = 17]): This is to account for differences in data collection between Ontario and other provinces and territories
4. Palliative care (ICD-10-CA: Z51.5) coded as most responsible diagnosis (MRDx). For Quebec data: palliative care (ICD-10-CA: Z51.5) coded as MRDx, or cancer (ICD-10-CA: C00–C97) coded as MRDx and Z51.5 coded in any secondary diagnosis field
5. 2018–2019 data onward: Medical assistance in dying (MAID) (Discharge Disposition Code = 73)
6. Age at admission younger than 1 year; infants are excluded because they have different mechanisms and risk factors for developing sepsis, as well as different coding standards
**Description:**
A subset of the denominator: hospital discharges with an in-hospital sepsis event identified during a hospital stay

**Inclusions:**
Based on clinical input, the most commonly occurring and significant codes for clinical practice are included in the indicator.

Sepsis events are identified as follows:

Non-Quebec abstracts:
1. Sepsis (ICD-10-CA: A40, A41, B37.7, R65.1, R57.2) as type (2)

OR
2. Sepsis as a post-procedural complication in the same cluster:
   a. Sepsis (ICD-10-CA: A40, A41, B37.7, R65.1, R57.2) as type (3) and infection following a procedure (ICD-10-CA: T80.2, T81.4, T82.6, T82.7, T83.5, T83.6, T84.5, T84.6, T84.7, T85.7, T88.0) as type (2) and external cause code (ICD-10-CA: Y60–Y84) as type (9) OR
   b. Septic shock (ICD-10-CA: R57.2) as type (3) and shock during or resulting from a procedure (ICD-10-CA: T81.1) as type (2) and external cause codes (ICD-10-CA: Y60–Y84) as type (9)

**Quebec abstracts:**
1. Sepsis (ICD-10-CA: A40, A41, B37.7, R65.1, R57.2) as type (2)

OR
2. Sepsis as a post-procedural complication on the same abstract:
   a. Sepsis (ICD-10-CA: A40, A41, B37.7, R65.1, R57.2) as type (3) and infection following a procedure (ICD-10-CA: T80.2, T81.4, T82.6, T82.7, T83.5, T83.6, T84.5, T84.6, T84.7, T85.7, T88.0) as type (2) and external cause code (ICD-10-CA: Y60–Y84) as type (9) OR
   b. Septic shock (ICD-10-CA: R57.2) as type (3) and shock during or resulting from a procedure (ICD-10-CA: T81.1) as type (2) and external cause codes (ICD-10-CA: Y60–Y84) as type (9)

**Exclusions:**
Abstracts where sepsis is also identified as a pre-admit condition are excluded from the numerator:
— Abstracts with sepsis codes (ICD-10-CA: A40, A41, B37.7, R65.1, R57.2) or the associated post-procedural complication codes (ICD-10-CA: T80.2, T81.1, T81.4, T82.6, T82.7, T83.5, T83.6, T84.5, T84.6, T84.7, T85.7, T88.0) identified as pre-admit [type (M), (1) [(C) for Quebec data], (W), (X) or (Y)]
— Abstract with sepsis in obstetric patients where the puerperal sepsis code or the associated obstetric infection code is identified as pre-admit (ICD-10-CA: O98.502, O98.802) as type (M), (1) [(C) for Quebec data], (W), (X) or (Y)

As an exception, sepsis is not considered as a pre-admit condition when the above codes identified as type (M), (W), (X) or (Y) also appear as type (2) or within a post-admit sepsis coding scenario:
- sepsis code as type (2); or sepsis code as type (3) with an associated infection code as type (2) in sepsis as post-procedural or obstetric complications.

**Background, Interpretation and Benchmarks**
Sepsis is a clinical syndrome that occurs as a complication of infections. It is defined as a systemic inflammatory response due to infection. Sepsis is a leading cause of mortality and is linked to increased hospital resource utilization and prolonged stays in intensive care units. Appropriate preventive and therapeutic measures during a hospital stay can reduce the rate of infections and/or progression of infection to sepsis.

Rationale
The indicator addresses the extent to which acute care hospitals are effective in preventing the development of sepsis. It will help hospitals improve patient safety and learn from their peers regarding best practice methods for appropriate treatment of infections and prevention of sepsis.

Interpretation
A lower rate for this indicator is desirable.

HSP Framework Dimension
Health System Outputs: Safe
Areas of Need
Getting Better
Targets/Benchmarks
Not applicable

References


Canadian Institute for Health Information. Canadian Coding Standards for Version 2012 ICD-10-CA and CCI. Ottawa, ON: CIHI; 2012.


Availability of Data Sources and Results
Data Sources
DAD, HMDB
Type of Year:
Fiscal
First Available Year:
2014
Last Available Year:
2018

Geographic Coverage
All provinces/territories

Result Updates
Update Frequency Every year

Web Tool:
Your Health System: In Depth
URL:
Accessing Indicator Results on Your Health System: In Depth

Not applicable

Caveats and Limitations
In-hospital sepsis events can be due to either community- or hospital-acquired infections. Therefore, the in-hospital sepsis indicator does not necessarily capture hospital-acquired infections only. In addition, despite the implementation of national coding standards, there may be variations in charting and coding practices across the country that could affect the results.

Trending Issues
Not applicable

Indicator results are also available in

Your Health System: Insight; data is updated monthly starting from 2014–2015.

For additional information, please view the In-Hospital Sepsis FAQ document.