# Performance Measure Definition

## Stroke In-Hospital Mortality

### Name and Definition

<table>
<thead>
<tr>
<th>Full Name</th>
<th>30 Day In-Hospital Mortality Following Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Name</td>
<td>Stroke In-Hospital Mortality</td>
</tr>
<tr>
<td>Definition</td>
<td>The crude rate / risk-adjusted rate of all-cause in-hospital deaths occurring within 30 days after stroke inpatient admission to an acute care hospital.</td>
</tr>
<tr>
<td>Domain</td>
<td>Health Services Delivery</td>
</tr>
</tbody>
</table>

### Context

**Business Context**
Alberta Health Services (AHS) Strategic Performance Measures

**Rationale**
Stroke is one of the leading causes of death in Canada. Improving care for stroke patients is an organizational priority, best practices and performance measures for quality improvement for stroke care. Adjusted mortality rates following stroke may reflect the underlying effectiveness of treatment and quality of care. Mortality within 30 days following stroke admission is influenced by processes of care and may be improved by involving an interdisciplinary stroke teams.

**Notes for Interpretation**
Not all deaths are preventable. Nevertheless, an examination of the rate of death within 30 days after stroke could identify improvement opportunities in the processes of stroke care.

**Organizational Strategy**
The AHS Health Plan and Health Action Plan provide actions and deliverables that will be used to achieve the results/targets.

**Benchmark Comparisons**
The Canadian risk-adjusted rate reported by CIHI was 14.7% for fiscal year 2011/12

**Cited References**
Canadian Institute for Health Information (CIHI) Canadian Hospital Reporting Project (CHRP) – Technical Notes for Clinical Indicators, version last updated March, 2013
Available at: http://www.cihi.ca/CIHI-ext-portal/pdf/internet/CHRP_TNCI_PDF_EN

### Technical Specifications

**Metric**
1. Percentage (CRUDE Mortality Rate)  
2. Risk adjusted rate: \( \frac{\text{Observed cases/Expected Cases}}{\text{Canadian average rate}} \)

**Preferred Display Format**
1. 99.9%  
2. 99.9%

**Numerator**
Number of deaths from all causes occurring in hospital within 30 days of admission for stroke

**Inclusion Criteria for Numerator**
Cases considered are same as for the denominator.
Inpatient Separation with a disposition code of ‘07’ (Died)
(Discharge date of death record – admission date on stroke record ) <= 30 days

**Exclusion Criteria for Numerator**
Cases considered are same as for the denominator

**Data Source(s) for Numerator**
AHS Provincial Discharge Abstract Database (DAD)

**Refresh Rate for Numerator**
Quarterly
### Performance Measure Definition

**Data Steward for Numerator**
AHS Reporting Services, Data Integration, Measurement and Reporting (DIMR).

**Denominator**
Provincial Urgent Inpatient Stroke Admissions, 20 years of age and older, where no Stroke admission also occurred within the prior 12 month period.

**Inclusion Criteria for Denominator**
- Inpatient Stroke Discharges.
- Discharge Date between Apr 1 and Mar 31st of the fiscal year.
- Admission Category of ‘U’ (Urgent/Emergent)
- Age associated with stroke discharge >= 20
- Facility type = Acute Care
- Stroke (ICD-10-CA: I60 – I64) is coded as a diagnosis type M but not also as a Type 2 (exact diagnosis code match)
  - OR
  - Where another diagnosis is coded as type M and also a diagnosis type 2 (exact diag code match), and a diagnosis of stroke is coded as a diagnosis type 1 or (type W,X,Y but not also as a type 2)
  - OR
  - Where rehabilitation (ICD-10-CA: Z501, Z504 – Z509) is coded as a diagnosis type M and stroke is coded as a diagnosis type 1 or (type W, X or Y but not also as a type 2).

**Exclusion Criteria for Denominator**
- Patients with ULI of ‘0’, ‘1’, ‘000000000’, ‘111111111’.
- Invalid admission date/time or invalid discharge date/time.
- Invalid date of birth.
- Transfers from an Alberta Inpatient acute care site. (Inst_from like ‘80*’).
- Records with admission category of cadaveric donor or stillbirth (Admission Category Code = R or S)
- Age associated with index stroke record < 20.
- Stroke admissions (ICD-10-CA: I60 – I64) coded as type M, 1, 2, W, X or Y in the 12 months preceding the admission date on the index stroke record (within AHS).

**Data Source(s) for Denominator**
AHS Provincial Discharge Abstract Database (DAD)

**Refresh Rate for Denominator**
Quarterly

**Data Steward for Denominator**
AHS Reporting Services, Data Integration, Measurement and Reporting (DIMR).

**Technical Notes**
For more details, please see:
- Indicator Library: General Methodology Notes—Clinical Indicators, April 2014
- Indicator Library: Model Specification—Clinical Indicators, April 2014

**Calculation**

**CRUDE MORTALITY RATE**

\[
\frac{\text{(# of Stroke In-hospital Deaths <= 30 days)}}{\text{(# of Stroke Discharges)}} \times 100
\]

**RISK ADJUSTED RATE**

\[
\left[\frac{\text{Observed cases}}{\text{Expected Cases}}\right] \times \text{Canadian average rate}
\]

A. The Canadian average rate is based on 2010/11 as provided by CIHI
B. The observed number of deaths for a hospital is the actual count of deaths.
C. The expected number of deaths for a hospital is based on the sum of the probabilities of in-hospital death for cases from that hospital. Coefficients from CIHI used for calculating the probability of in-hospital death were from logistic regression models on the following independent variables age, sex, cancer, shock, heart failure, pulmonary edema, ischemic heart disease (acute), ischemic heart disease (chronic), renal failure, liver disease, other unspecified intracranial hemorrhage, intracerebral hemorrhage, stroke not specified as and hemorrhage or infarction, subarachnoid hemorrhage.

**Relationship to Other Indicators**
Not available

**Level of Reporting**

<table>
<thead>
<tr>
<th></th>
<th>National</th>
<th>No</th>
<th>Provincial</th>
<th>Yes</th>
<th>Zone</th>
<th>Yes</th>
<th>Site</th>
<th>Yes</th>
</tr>
</thead>
</table>

**Reporting Notes**
Sites with a denominator >= 25, on a consistent basis, will be reported by individual site. Caution may be needed for sites where the denominator is <25. For Zone Reporting, sites not meeting the above criteria can be grouped to "Other"

**Frequency of Reporting**

<table>
<thead>
<tr>
<th></th>
<th>Annually</th>
<th>Yes</th>
<th>Quarterly</th>
<th>Yes</th>
<th>Monthly</th>
<th>No</th>
<th>Other</th>
<th>No</th>
</tr>
</thead>
</table>

**Other Reporting Frequency**
Not applicable
### Limitations

CIHI uses first 11 Months of a fiscal year to capture denominator population and the last month for capturing numerator data. In Alberta we use 12 months of data to capture the denominator population crediting to the availability of continuous data in our database. This allows us to report on complete fiscal year. We have evaluated the potential impact of this difference by conducting rate comparison and trend analyses. The results showed that it did not affect the comparability between the results.