# 30-Day Stroke In-Hospital Mortality

**Name**
- 30-Day Stroke In-Hospital Mortality

**Short/Other Names**
- Not applicable

**Description**
The risk-adjusted rate of all-cause in-hospital death occurring within 30 days of first discharge from an acute care hospital with a diagnosis of stroke

For further details, please see the General Methodology Notes.

**Interpretation**
- Lower rates are desirable.
- Inter-regional variations in stroke mortality rates may be due to jurisdictional and institutional differences in standards of care, as well as to other factors that are not included in the adjustment.

**HSP Framework Dimension**
- Health System Outputs: Appropriate and effective

**Areas of Need**
- Getting Better

**Geographic Coverage**
- All provinces/territories

**Reporting Level/Disaggregation**
- National, Province/Territory, Region

**Indicator Results**
- [http://yourhealthsystem.cihi.ca/epub/?language=en](http://yourhealthsystem.cihi.ca/epub/?language=en)

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### Identifying Information

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**Indicator Description and Calculation**

**Description**
The risk-adjusted rate of all-cause in-hospital death occurring within 30 days of first discharge from an acute care hospital with a diagnosis of stroke

For further details, please see the General Methodology Notes.

**Calculation:**

**Description**
The risk-adjusted mortality rate (RAMR) is calculated by dividing the observed number of in-hospital deaths by the expected number of in-hospital deaths and multiplying by the Canadian average in-hospital death rate.

**Unit of Analysis for Denominator Cases:** Single admission

**Geographic Assignment**
- Place of residence or service

**Calculation:**

**Type of Measurement**
- Rate - per 100

**Adjustment Applied**
The following covariates are used in risk adjustment:
For a detailed list of covariates used in the model, please refer to the Model Specification document.

**Method of Adjustment**
- Logistic regression

**Description:**
Total number of first stroke discharges in an 11-month period

**Inclusions:**
1. a. Stroke (per codes specified below) is coded as most responsible diagnosis (MRDx) but not also as a diagnosis type (2); or

b. Where another diagnosis is coded as MRDx and also a diagnosis type (2), and a diagnosis of stroke is coded as a type (1) [type (C) for Quebec data] or type (W), (X) or (Y) but not also as type (2); or

c. Where rehabilitation or convalescence (ICD-10-CA: Z50.1, Z50.5–Z50.9, Z54.8, Z54.9) is coded as MRDx and stroke as a type (1) [type (C) for Quebec data] or type (W), (X) or (Y) but not also as type (2)

Stroke diagnosis codes:
- **Subarachnoid haemorrhage (ICD-10-CA: I60)**
- **Intracerebral haemorrhage (ICD-10-CA: I61, I62.9 [for data years prior to 2015–2016])**
- **Ischemic stroke (ICD-10-CA: I63.0-I63.5, I63.8, I63.9, H34.1)**
- Stroke, not specified as haemorrhage or infarction (ICD-10-CA: I64)
- Venous sinus/cortical vein thrombosis (ICD-10-CA: I63.6, I67.6, G08)

**Denominator**

*i62.9 was used for coding of hemorrhagic stroke not otherwise specified in fiscal years prior to 2015–2016. As of 2015–2016 data, this condition is coded to I61.9 (Intracerebral haemorrhage, unspecified). Note: Transient ischemic attacks are not included in this indicator.*

2. Admission between April 1 and March 1 of the following year (period of case selection ends March 1 to allow for 30 days of follow-up)
3. Age at admission 20 years and older
4. Sex recorded as male or female
5. Admission to an acute care institution (Facility Type Code = 1)
6. Admission category recorded as urgent/emergent (Admission Category Code = U)

**Exclusions:**
1. Records with an invalid health card number
2. Records with an invalid code for province issuing health card number
3. Records with an invalid admission date
4. Records with admission category of cadaveric donor or stillbirth (Admission Category Code = R or S)
5. Previous stroke: Records with a stroke inpatient admission (stroke diagnosis codes as specified above) coded as diagnosis type (M), (1), (C) [for Quebec data only], (2), (W), (X) or (Y), and Facility Type Code = 1, within one year prior to the admission date of the index discharge

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

**Inclusions:**
1. Discharge as death (Discharge Disposition Code = 07)
2. Admission to an acute care institution (Facility Type Code = 1)
3. (Discharge date on death record) - (Admission date on stroke record) less than or equal to 30 days

**Exclusions:**
1. Records with an invalid discharge date

**Background, Interpretation and Benchmarks**

**Rationale**
Stroke is a leading cause of death and long-term disability. Adjusted mortality rates following stroke may reflect the underlying effectiveness of treatment and quality of care. Lower rates are desirable.

**Interpretation**
Inter-regional variations in stroke mortality rates may be due to jurisdictional and institutional differences in standards of care, as well as to other factors that are not included in the adjustment.

**HSP Framework Dimension**
Health System Outputs: Appropriate and effective

**Areas of Need**
Getting Better

**Targets/Benchmarks**
Not applicable

**References**


**Availability of Data Sources and Results**

**Data Sources**
DAD, HMDB

**Type of Year:**
Fiscal

**First Available Year:**
1998

**Last Available Year:**
2014

**Geographic Coverage**
All provinces/territories

**Reporting Level/Disaggregation National, Province/Territory, Region**

**Result Updates**
Update Frequency
Every year

Indicator Results

Web Tool:
Health Indicators E-publication
URL: http://yourhealthsystem.cihi.ca/epub/?language=en

Beginning with rates based on 2003–2004 to 2005–2006 data, case selection criteria for stroke were revised to include patients transferred to rehabilitation during their index admission. In this case, stroke may not be coded as the most responsible diagnosis; these cases were previously excluded from the indicator.

Updates
Beginning with 2004 rates, stroke case selection criteria were revised; therefore, comparison of rates from 2004 onward with those of previous years should be made with caution.

Caveats and Limitations
Not applicable

Trending Issues
Indicator results by place of residence are based on three years of pooled data. The reference year reflects the mid-point of a three-year period.

The indicator excludes stroke cases coded with a most responsible diagnosis of palliative care (ICD-10-CA Z51.5). It is not possible to determine when during the admission it was decided to provide palliative care.

Comments
Indicator results by place of service, based on one year of data, are also available
– By request