30-Day Acute Myocardial Infarction In-Hospital Mortality

Name	30-Day Acute Myocardial Infarction 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 admission to an acute care hospital with a diagnosis of acute myocardial infarction (AMI) For further details, please see the General Methodology Notes.
Interpretation	Lower rates are desirable.
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

Identifying Information

Name 30-Day Acute Myocardial Infarction In-Hospital Mortality

Short/Other Names Not applicable

Indicator Description and Calculation

Description	The risk-adjusted rate of all-cause in-hospital death occurring within 30 days of first admission to an acute care hospital with a diagnosis of acute myocardial infarction (AMI) 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.
Calculation: Geographic Assignment	Unit of analysis for denominator cases: Single admission Place of residence or service
Calculation: Type of Measurement	Rate - per 100
Calculation: 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.
Calculation: Method of Adjustment	Logistic regression
Denominator	**Description:** Total number of first AMI discharges in an 11-month period **Inclusions:** 1. a. Acute myocardial infarction (AMI) (ICD-10-CA: I21, I22; ICD-9/ICD-9-CM: 410) 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 AMI 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 coronary artery disease (ICD-10-CA: I25.0, I25.1, I25.8, I25.9; ICD-9/ICD-9-CM: 429.2, 414.0, 414.8, 414.9) is coded as MRDx, AMI as type (1) [type (C) for Quebec data] or type (W), (X) or (Y) but not also as type (2); along with revascularization procedure (percutaneous coronary intervention—CCI: 1.IJ.50^^; 1.IJ.57.GQ^^; 1.IJ.54.GQ-AZ [this code is used for 2006–2007 to 2008–2009 data only]; CCP: 48.02, 48.03; ICD-9-CM: 36.01, 36.02, 36.05; or coronary artery bypass—CCI: 1.IJ.76^^; CCP: 48.1^; ICD-9-CM: 36.1^) 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 AMI: Records with an AMI inpatient admission [(ICD-10-CA: I21, I22; ICD-9/ICD-9-CM: 410) coded as diagnosis type (M), (1), (C) (for Quebec data only), (2), (W), (X) or (Y); Facility Type Code = 1] within one year prior to the admission date of the index discharge
Numerator	**Description:** Number of deaths from all causes occurring in hospital within 30 days of admission for AMI **Inclusions:** 1. Discharges as deaths (Discharge Disposition Code = 07) 2. Admission to an acute care institution (Facility Type Code = 1) 3. (Discharge date on death record) (Admission date on AMI record) less than or equal to 30 days **Exclusions:** 1. Records with an invalid discharge date
Background, Interpretation and Benchmarks	
Rationale	A lower risk-adjusted mortality rate following AMI may be related to quality of care or other factors. It has been shown that the 30-day in-hospital mortality rate is highly correlated (r = 0.9) with total mortality (death in and out of hospital) following AMI. Variations in 30-day in-hospital mortality rates may be due to jurisdictional and institutional differences in care practices, as well as to other factors that were not included in the adjustment.
Interpretation	Lower rates are desirable.
HSP Framework Dimension	Health System Outputs: Appropriate and effective
Areas of Need	Getting Better
Targets/Benchmarks	Not applicable
References	Hosmer DW, Lemeshow S. Confidence Interval Estimates of an Index of Quality Performance Based on Logistic Regression Models. *Stat Med* 1995;(14):2161-2172. Tu JV, Austin P, Naylor CD, Iron, K, Zhang H. Acute Myocardial Infarction Outcomes in Ontario (Methods Appendix). Cardiovascular Health & Services in Ontario: An ICES Atlas (Technical and Methods Appendices). Eds. Naylor CD and Slaughter PM. Toronto, ON; Institute for Clinical Evaluative Sciences:1999.
Availability of Data Sources and Results	
Data Sources	DAD, HMDB
Available Data Years	**Type of Year:** Fiscal **First Available Year:** 1998 **Last Available Year:** 2016
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 the 2004 rates, AMI case selection criteria were revised to account for the fact that an increasing number of AMI

Updates	patients are undergoing revascularization procedure (percutaneous coronary intervention or coronary artery bypass) at their index admission. In the case of revascularization procedure, AMI may not be coded as the most responsible diagnosis, and these cases were previously excluded from the indicator. In addition, exclusion criteria were revised and patients with a length of stay of less than three days and discharged alive are no longer excluded.
Quality Statement	
Caveats and Limitations	Not applicable
Trending Issues	Starting with 2004 rates, AMI case selection criteria were revised; therefore, comparison of rates from 2004 onward with those of previous years should be made with caution. 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.
Comments	Indicator results by place of service, based on one year of data, are also available at https://www.cihi.ca/sites/default/files/document/additional-facility-indicators-results-en.xlsx.