

The Fraser Institute

Hospital Report Card

Ontario 2008



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11 Methodological Appendices



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Appendix A: Discharge Abstract Database (DAD)

In the first stage of data processing, records for all hospitals and municipalities were drawn from the DAD data extracts (from CIHI) for use in the *Hospital Report Card*. The following DAD fields were used in our analysis.

Province Province of the patient.

Institution number Numeric value corresponding to each acute care facility. The institution numbers corresponding to those institutions that did not agree to be identified in this report were received from CIHI in an encrypted format.

Postal Code To protect patient confidentiality, all postal codes were truncated to the first 3 characters (representing the Forward Sortation Area) and grouped into corresponding municipalities as described by Canada Post. Please refer to Appendix H for further details.

Age code A unit value to denote how the patient's age was recorded. Please refer to Appendix I for further details.

Age units Age of patient at the time of admission, which must be evaluated using the age code. Please refer to Appendix I for further details.

Gender Gender of the patient.

Admission date Date the patient was admitted to the facility.

Discharge Date Date the patient was separated from the facility.

Institution from type A code identifying the level of care provided by the facility from which the patient was transferred to the acute care institution, where

- 1= acute care
- 2= general rehabilitation facility
- 3= chronic care facility
- 4= nursing home
- 5= psychiatric facility
- 6= unclassified or other type of facility
- 7= special rehabilitation facility
- 8= home care
- 9= home for the aged
- A= day surgery
- E= emergency room
- O= organized outpatient department of reporting facility
- N= ambulatory care facility (added in FY2003).

Admission category Type of admission to the facility, where

- E = elective admissions
- U = emergent/urgent
- N = newborn
- S = stillbirth
- R = cadaver.

Discharge disposition Disposition of Patient, i.e. whether the patient died while in the facility (used for DAD data coded in ICD-10-CA/CCI) where

- 1 = transferred to another facility providing inpatient hospital care
- 2 = transferred to a long term care facility
- 3 = transferred to other (palliative care/hospice, etc.)
- 4 = discharged to a home setting with support services
- 5 = discharged home
- 6 = signed out (against medical advice)
- 7 = died
- 8 = cadaver
- 9 = stillbirth.

Acute Transfer Indicator A code that identifies the acute transfer status of a patient on discharge from the reporting facility where

- 0 = no transfer to or from an acute care facility
- 1 = patient transferred to the reporting facility from another acute care facility
- 2 = patient transferred from the reporting facility to another acute care facility
- 3 = patient transferred to the reporting facility from another acute care facility and then transferred to another acute care facility upon discharge from the reporting facility

Blank = for all day surgery records.

Exit Alive Method of separation from the facility (used for DAD data coded in ICD-9-CCP) where

- D = the patient was discharged or transferred from the facility alive
- S = sign out. Patient left the facility against medical advice

Blank = patient death or stillbirth

Entry Code Method of admission to the facility. This field was used in conjunction with “Age code” to exclude all “Stillbirths” from analysis where

- E = emergency department from the reporting hospital
- D = direct
- N = newborn
- S = stillborn (in reporting hospital)
- C = clinic from the reporting hospital
- P = day surgery from the reporting hospital.

Diagnosis codes International Classification of Disease codes (ICD-9 or ICD-10) [1] identifying the condition considered to be the most responsible for the patient's condition treated during hospitalization.

Diagnosis prefix codes A code that provides greater detail than the ICD diagnosis code. This field was applied by CIHI to DAD data coded in ICD-9-CCP only to identify "External cause of injury codes."

Procedure and/or Intervention codes CCP or CCI procedure codes that indicate the procedure performed on the patient during the hospitalization.

Procedure dates Date the procedure was performed on the patient.

Procedure Suffix A code that provides further specificity to the ICD-9-CCP procedure code where

- 8 = cancelled surgery
- 9 = previous surgery (surgery that the patient had prior to this hospitalization)
- 0 = procedure performed out of hospital.

Intervention out of hospital indicator = Y Denotes a procedure that was performed in another facility during the patient's hospitalization (for use with data coded in CCI only).

Intervention status attribute = A A code denoting a cancelled procedure (for use with data coded in CCI only).

Acute length of stay The total number of days the patient was in the acute care facility.

Weight in grams Captured for newborns and neonates (age \leq 28 days) inclusively.

[1] Please see the following links for further details on ICD-9-CCP and ICD-10-CA, respectively: http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=codingclass_icd9cm_e and http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=codingclass_icd10_e

Note: All procedures denoted as "Procedure Suffix" = 0, 8 or 9 were removed from all analysis.

Note: All procedures denoted as "Intervention out of hospital indicator" = Y were removed from analysis.

Note: All procedures denoted as "Intervention status attribute" = A were removed from analysis.

Appendix B: The Centers for Medicare and Medicaid Services (CMS) Diagnosis Related Groups (DRG) Grouper & 3M™ All Patient Refined Diagnosis Related Groups (APR™ DRG Classification System) and CMS Grouper with Medicare Code Editor Software

In order to use the CMS and 3M™ APR™ DRG Classification System software (1997/98–2004/05) or the CMS Grouper with Medicare Code Editor (2005/06), the DAD dataset received from CIHI required several standard modifications to account for differences in the Canadian and US coding methodologies. In other cases, no modifications were required. The table below lists all fields imported from the DAD and specifies what modifications, if any, were required.

Data Elements required by the CMS- and 3M™ APR™ DRG Classification System software

Variable name	Description	Value description	DAD Data Element or Comment
Key	Unique case identifier	<i>Numeric</i>	Each record was given a unique case identifier number
Adate	Date of admission Used for length of stay (LOS) calculation	<i>Numeric</i> dd.mm.yyyy	Date of Admission was taken directly from DAD. No changes were made.
Ddate	Date of discharge Used for LOS calculation	<i>Numeric</i> dd.mm.yyyy	Date of Discharge was taken directly from DAD. No changes were made.
Alos	Calculated LOS overrides entered LOS	<i>Numeric</i> (Days)	Acute length of stay information was taken directly from DAD. No changes were made.
Bdate	Date of birth	<i>Numeric</i> dd.mm.yyyy	CIHI encrypts all patient identifiers in the DAD prior to cutting the dataset, including "date of birth" information. Since this field is required for all patients ≤ 28 days, it was calculated by subtracting the patient's age (in days) from the admission date. "Birth date" for all other patients remained as a "blank" in order to run the software.
Agey	Age in years at admission	<i>Numeric</i> Age in years	See Appendix I for details
Aged	Age in days (coded only when the age in years is less than 1)	<i>Numeric</i> Age in days	See Appendix I for details (Note: this change was not required for CMS Grouper with Medicare Code Editor software.)
Sex	Sex of patient	<i>Numeric</i> Male = 1 Female = 2	The DAD codes Male = M, Female = F. These values were recoded to Male = 1 & Female = 2. All other values of "Other" and "Undifferentiated" were omitted from analysis.

Variable name	Description	Value description	DAD Data Element or Comment
DSTAT	Discharge Status	<p><i>Numeric</i></p> <p>Discharged to short term hospital = 2</p> <p>Discharged to other facility = 5</p> <p>Patient died = 20</p>	<p>Two DAD fields were combined to create the "dstat" field.</p> <p>DAD Data from FY1997 to FY2001:</p> <p>Patients that were discharged to a short term hospital were extracted from DAD field "Acute transfer indicator" = "2" (patient transferred from the reporting facility to another acute care facility, please see Appendix A for further details).</p> <p>All patients that died in-hospital were extracted from DAD field "Exit alive" = "blank."</p> <p>DAD Data from FY2002 to FY2005:</p> <p>Patients discharged to a short term hospital were extracted from DAD field "Acute transfer indicator" = "2" (patient transferred from the reporting facility to another acute care facility, please see Appendix A for further details).</p> <p>NB: All patients that died in-hospital were extracted from DAD field "Discharge Disposition" = 7 (patient died).</p> <p>All records not classified as being discharged to a short term hospital or that died in-hospital were classified as "other".</p> <p>NB: When ICD-10 was introduced in 2002/03, several data fields were removed (including "Exit Alive") and new fields were added to the record layout (including "Discharge Disposition").</p>
BWT	Weight at time of admission in metric values. Mandatory for newborns and neonates less than 29 days at admission.	<p><i>Numeric</i></p> <p>(grams)</p>	Weight at birth (grams) was taken directly from DAD. No changes were made.
DMV	Days on Mechanical Ventilation	<i>Numeric</i>	DMV information is not directly available from the DAD but is required to run the software. This field was created as a "dummy variable" and left "blank".
Diagnosis Codes	ICD-9-CM diagnosis codes. DX1 is the principal diagnosis, DX2-DX30 are secondary diagnoses.	<i>String</i>	<p>All Diagnosis codes contained in the DAD were converted to ICD-9-CM.</p> <p>NB: Please refer to Appendix J for further explanation on classification conversions.</p>
Procedure Codes	ICD-9-CM procedure codes. PR1 is the principal diagnosis, PR2-PR30 are secondary procedures.	<i>String</i>	<p>All Procedure codes contained in the DAD were converted to ICD-9-CM.</p> <p>NB: Please refer to Appendix J for further explanation on classification conversions.</p>

Appendix C: Agency for Healthcare Research and Quality's (AHRQ) Inpatient Quality Indicators (IQI) and Patient Safety Indicator (PSI) modules

In order to use AHRQ's QI and PSI modules, the original DAD dataset received from CIHI required several standard modifications to account for differences in the Canadian and US coding methodologies. Other fields required no modifications. The table below lists all relevant fields for AHRQ software and what modifications, if any, were performed.

Required AHRQ Data Element and Description

Variable name	Description	Value description	DAD Data Element or Comment
Key	Unique case identifier.	<i>Numeric</i>	Each record analyzed was given a unique case identifier number.
Age	Patient's age in years at admission.	<i>Numeric</i> Age in years.	See Appendix I for details.
Ageday	Patient's age in days at admission (coded only when the age in years is less than 1).	<i>Numeric</i> Age in days.	See Appendix I for details.
Race	Patient's race.	<i>Numeric</i> White = 1. Black = 2. Hispanic = 3. Asian/Pacific Island = 4. Native American = 5. Other = 6.	Race information is not captured in the DAD. Accordingly, all patient records were set to "6" (Other).
Sex	Patient's gender.	<i>Numeric</i> Male = 1. Female = 2.	DAD codes Male = M, Female = F. These values were recoded to Male = 1 & Female = 2. All other values of "Other" and "Undifferentiated" were omitted from all analysis.
Pay1	Expected primary payer.	<i>Numeric</i> Medicare = 1. Medicaid = 2. Private, incl. HMO = 3. Self-pay = 4. No charge = 5. Other = 6.	Due to differences in the Canadian healthcare system, the DAD does not contain this information. Accordingly, all patient records were set to "6" (Other).
Hospstco	Hospital location (FIPS State/county code).	<i>Numeric</i> Modified Federal Information Processing Standards State/County code.	To protect patient confidentiality postal codes were truncated to FSAs by CIHI before the dataset was cut. Once received, FSAs were grouped into municipalities as described by Canada Post. Please see Appendix H for details.

Variable name	Description	Value description	DAD Data Element or Comment
Hospid	Data source hospital number.	<i>Numeric</i> Hospital identification number.	Institution Number as described by CIHI. No changes were made to this field.
Disp	Patient's disposition.	<i>Numeric</i> Routine = 1. Short-term hospital = 2. Skilled nursing facility = 3. Intermediate care = 4. Another type of facility = 5. Home health care = 6. Against medical advice = 7. Died in the hospital = 20.	Two DAD fields were combined to create the "Disp" field. DAD Data from FY1997 to FY2001: Patients that were discharged to a short term hospital were extracted from DAD field "Acute transfer indicator" = "2" (patient transferred from the reporting facility to another acute care facility, please see Appendix A for further details). All patients that died in-hospital were extracted from DAD field "Exit alive" = "blank". DAD Data from FY2002 to FY2005: Patients discharged to a short term hospital were extracted from DAD field "Acute transfer indicator" = "2" (patient transferred from the reporting facility to another acute care facility, please see Appendix A for further details). NB: All patients that died in-hospital were extracted from DAD field "Discharge Disposition" = 7 (patient died). All records not classified as being discharged to a short term hospital or that died in-hospital were classified as "other". NB: When ICD-10 was introduced in 2002/03, several data fields were removed (including "Exit Alive") and new fields were added to the record layout (including "Discharge Disposition"). Two fields in the DAD were combined to create the "dstat" field.
Atype	Admission Type.	<i>Numeric</i> Emergency = 1. Urgent = 2. Elective = 3. Newborn = 4. Delivery = 5. Other = 6.	Please see Appendix C, 2B for further details.
Asource	Admission Source.	<i>Numeric</i> 1 = ER. 2 = Another Hospital. 3 = Another facility. 4 = Court/law enforcement. 5 = Routine/birth/other.	Please see Appendix C, 2B for further details.
Los	Length of Stay.	<i>Numeric</i>	Information taken from DAD field "acute length of stay".

Variable name	Description	Value description	DAD Data Element or Comment
APR_DRG	3M™ APR™ DRG Classification System category	<i>Numeric</i>	APR-DRG from the 3M™ APR™ DRG Classification System software. Used for FY 1997 to 2004. Note that, for FY 2005, risk adjustment was performed by the AHRQ software.
Severty	3M™ APR™ DRG Classification System Severity Score	<i>Numeric</i>	Produced by 3M™ APR™ DRG Classification System. Rating of 1-4. Describes severity of illness of patient based on co-morbidities, age, sex etc. Used for FY 1997 to 2004.
RiskMort	3M™ APR™ DRG Classification System Mortality Score	<i>Numeric</i>	Produced by 3M™ APR™ DRG Classification System software. Rating of 1-4. Describes risk of patient's mortality based on co-morbidities, age, sex etc. Used for FY 1997 to 2004.
DRG	Diagnosis Related Group.	<i>Numeric</i> DRG from CMS DRG Grouper or CMS Grouper with Medicare Code Editor.	Produced by 3M™ APR™ DRG Classification System grouper software for FY 1997 to 2004. Produced by CMS Grouper for Medicare Code Editor for FY 2005. Groups patients' records based on the primary diagnosis.
MDC	Major Diagnostic Category.	<i>Numeric</i> MDC from CMS DRG Grouper or AHRQ Quality Indicators software.	Produced by 3M™ APR™ DRG Classification System grouper software for FY 1997 to 2004. Produced by AHRQ Quality Indicators software for FY 2005. Groups patient records based on the primary diagnosis.
NDX	Number of non-missing diagnosis codes used on each discharge record.	<i>Numeric</i> Counts principal and all secondary diagnoses.	This field was created by assigning a value of 1 to any diagnosis field containing a value and a 0 to a diagnosis field without a value. These values were then summed to calculate NDX.
NPR	Number of non-missing procedure codes used on each discharge record.	<i>Numeric</i> Counts principal and all secondary procedures.	See explanation for creation of NDX.
DX1 – DX25	ICD-9-CM diagnoses codes. DX1 is the principal diagnosis, DX2-DX30 are secondary diagnoses.	<i>String, 5 characters</i>	All Diagnosis codes contained in the DAD were converted to ICD-9-CM. NB: See Appendix J for further explanation on classification conversions.
PR1 – PR20	ICD-9-CM procedure codes. PR1 is the principal diagnosis, PR2-PR30 are secondary procedures.	<i>String, 4 characters</i>	All Diagnosis codes contained in the DAD were converted to ICD-9-CM. NB: See Appendix J for further explanation on classification conversions.
PRDAY1-PRDAY20	Days from admission to procedure. PR1 is the principal procedure, PR2-PR20 are secondary procedures.	<i>Numeric</i>	Some PSIs require this field for calculating a given indicator.

Variable name	Description	Value description	DAD Data Element or Comment
Year	Year of discharge. The patient's year of discharge. For example, a patient discharged on July 7, 2004 would have a discharge year of "2004."	<i>Numeric</i> YYYY	ICD-9-CM diagnosis code for acute ill-defined cerebrovascular disease (436) (required in the denominator of stroke mortality rate/IQI 17) is used only for patients discharged before or on September 30, 2004. In order to be consistent throughout this study (from 1997/98 to 2005/06), this optional data field was created to exclude this code from all years of data analysed for IQI 17.
DQTR	Quarter of discharge. The calendar quarter of patient's discharge. For example, a patient discharged on July 7, 2004 would have a discharge quarter of "3."	<i>Numeric</i> 1 = January to March. 2 = April to June. 3 = July to September. 4 = October to December.	Used to exclude cases with ICD-9-CM code 436 that were discharged after Sept. 30, 2004 from the denominator population of IQI 17. See explanation for "Year" above.

Other DAD Data Elements Translated for Calculation of AHRQ's IQIs and PSIs

A. Admission type (Atype)

All information used for this field was taken from the DAD field "Admission Category" and converted into the required numeric value for AHRQ's IQI and PSI modules. The following translations were performed. [1]

Admission Category (DAD)	Atype (AHRQ)
E = Elective Admissions	3 = Elective
N = Newborn	4 = Newborn

[1] The "Admission type" variable is only used in calculating PSI indicators (i.e. not for calculating IQI indicators). The values "3" and "4" are referenced by the PSI code to identify elective surgeries and newborn admissions.

B. Admission source (Asource)

All information used for this field was taken from the DAD field "Admission Category." The following translations were performed. [2]

Institution from type (DAD)	Asource (AHRQ)
1 = Acute Care	2 = Another Hospital
2 = General Rehabilitation Facility	3 = Another Facility including Long Term Care (LTC)
3 = Chronic Care Facility	3 = Another Facility including LTC
4 = Nursing Home	3 = Another Facility including LTC
5 = Psychiatric Facility	3 = Another Facility including LTC
6 = Unclassified or other type of Facility	3 = Another Facility including LTC
7 = Special Rehabilitation Facility	3 = Another Facility including LTC

[2] The value "2" is referenced by the IQI code to identify transfers from another short-term hospital. The values "2" and "3" are referenced by the PSI code to identify transfers from another hospital or facility.

8 = Home Care	3 = Another Facility including LTC
9 = Home for the Aged	3 = Another Facility including LTC
A = Day Surgery	3 = Another Facility including LTC
O = Organized Outpatient Department of Reporting Facility	3 = Another Facility including LTC

Appendix D: Hospital Identification

A. Participating Hospitals

Several institutions either amalgamated or changed the method by which they submitted DAD data between 1997/98 and 2005/06. The following table describes how a given institution submitted DAD data throughout the period of this report, where:

- I = Institution submitted DAD data as an individual institution.
- W = Institution submitted DAD data with other sites.
- = Institution did not submit DAD data.
- X = Institution is no longer participating in the *Hospital Report Card*.

Institution	2005/06	
Arnprior and District Memorial Hospital (The)	I	The following hospitals agreed to be identified in both the <i>Hospital Report Card: Ontario 2006</i> and the <i>Hospital Report Card: Ontario 2008</i> :
Blind River District Health Centre	I	
Cambridge Memorial Hospital	X	The Arnprior and District Memorial Hospital,
Carleton Place and District Memorial Hospital	X	
Chapleau Health Services	I	Geraldton District Hospital,
Dryden Regional Health Centre	X	Haldimand War Memorial Hospital,
Englehart & District Hospital	I	Hanover and District Hospital,
Geraldton District Hospital	I	Clinton Public Hospital,
Glengarry Memorial Hospital	X	Seaforth Community Hospital,
Groves Memorial Community Hospital	I	St. Mary's Memorial Hospital,
Haldimand War Memorial Hospital	I	Stratford General Hospital,
Haliburton Highlands Health Services Corporation		McCausland Hospital,
<i>Haliburton Site</i>	X	Nipigon District Memorial Hospital,
<i>Minden Site</i>	X	St. Thomas-Elgin General Hospital,
Hamilton Health Sciences		Timmins and District Hospital,
<i>General Hospital Site</i>	X	West Nipissing General Hospital.
<i>Henderson Hospital Site</i>	X	
<i>McMaster University Medical Centre Site</i>	X	
Hanover and District Hospital	I	
Hawkesbury and District General Hospital	I	
Huron Perth Healthcare Alliance		
Clinton Public Hospital	I	
Seaforth Community Hospital	I	
St. Mary's Memorial Hospital	I	
Stratford General Hospital	I	
Grand River Hospital Corporation		
<i>Kitchener Freeport Hosp Site</i>	—	
<i>Kitchener Waterloo Hosp Site</i>	X	
Lady Dunn Health Centre	X	
Lennox and Addington County General Hospital	X	
Listowel and Wingham Hospitals Alliance		

Institution	2005/06
Listowel Memorial Hospital	I
<i>Wingham & District Hospital</i>	I
London Health Sciences Centre	
<i>University Site</i>	X
<i>Victoria South Site</i>	X
<i>Children's Hospital of Western Ontario</i>	X
McCausland Hospital	I
Mount Sinai Hospital	X
Nipigon District Memorial Hospital	I
Norfolk General Hospital	X
North York General Hospital	
<i>North York General Hospital</i>	X
<i>Branson Hospital Site</i>	—
Notre Dame Hospital	X
Orillia Soldiers' Memorial Hospital	I
Ottawa Hospital (The)/L'Hôpital d'Ottawa	
<i>Civic Site</i>	X
<i>General Site</i>	X
<i>Riverside Site (converted to urgent care clinic)</i>	—
<i>Rehabilitation Centre Site</i>	—
<i>Perth & Smith Falls District Hospital</i>	
<i>Perth Site</i>	I
<i>Smith Falls Site</i>	I
<i>Red Lake Margaret Cochenour Memorial Hospital</i>	I
Rouge Valley Health System	
<i>Ajax and Pickering Site</i>	X
<i>Centenary Health Centre Site</i>	X
Sensenbrenner Hospital (The)	X
Sioux Lookout Meno-Ya-Win Health Centre	
<i>Sioux Lookout District Health Centre Site</i>	W
<i>Sioux Lookout Zone Hospital Site</i>	W
<i>Smooth Rock Falls Community Hospital</i>	I
South Huron Hospital	X
South Muskoka Memorial Hospital	X
Stevenson Memorial Hospital	I
St. Mary's General Hospital	X
St. Thomas-Elgin General Hospital	I
St. Joseph's Health Care System – Hamilton	X
Strathroy Middlesex General Hospital	I
Sunnybrook & Women's College Health Sciences Cen.	
<i>Sunnybrook Health Sciences Site</i>	X
<i>Women's College Site</i>	—
<i>Orthopaedic and Arthritic Site</i>	X
Thunder Bay Regional Health Sciences Centre	X

Institution	2005/06
Timmins and District General Hospital	I
Trillium Health Centre	
<i>The Mississauga Hospital Site</i>	X
<i>Etobicoke Queensway Gen. Site</i>	X
University of Ottawa Heart Institute	X
West Nipissing General Hospital	I
West Parry Sound Health Centre	
<i>Parry Sound District Site</i>	X
<i>Parry Sound St. Joseph's Site</i>	—
William Osler Health Centre	
<i>Brampton Site</i>	X
<i>Georgetown Site</i>	X
<i>Etobicoke General Site</i>	X
<i>Wilson Memorial General Hospital</i>	I
Winchester District Memorial Hospital	X
Windsor Regional Hospital	
<i>Windsor Western Hosp Site</i>	X
<i>Windsor Metropolitan General Site</i>	X

B. Non-Participating Hospitals

The institution numbers from all those that did not agree to be identified in this report were encrypted by CIHI prior to delivery and assigned an arbitrary number. Hospitals that were encrypted for all years kept the same identifier and can be compared across years. However, hospitals identified in some years and not in others were assigned a new random identifier and cannot be tracked across years. The following table describes whether and how each unidentified hospital submitted DAD data in a given year, where:

Y = Hospital submitted DAD data.

— = no data submitted.

Unknown hospital	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Hospital 1	—	—	—	Y	Y	Y	Y	Y	Y
Hospital 2	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 3	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 4	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 5	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 6	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 7	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 8	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 9	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 10	—	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 11	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 12	Y	Y	Y	Y	Y	Y	Y	Y	Y

Unknown hospital	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Hospital 13	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 14	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 15	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 16	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 17	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 18	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 19	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 20	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 21	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 22	—	—	—	Y	Y	Y	Y	Y	Y
Hospital 23	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 24	—	—	Y	Y	Y	Y	Y	—	—
Hospital 25	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 26	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 27	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 28	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 29	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 30	—	—	—	—	—	Y	Y	Y	Y
Hospital 31	—	—	—	Y	Y	Y	Y	Y	Y
Hospital 32	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 33	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 34	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 35	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 36	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 37	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 38	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 39	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 40	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 41	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 42	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 43	—	—	—	Y	Y	Y	Y	Y	Y
Hospital 44	—	—	—	Y	Y	Y	Y	Y	Y
Hospital 45	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 46	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 47	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 48	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 49	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 50	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 51	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 52	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 53	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 54	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 55	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 56	—	—	Y	Y	Y	Y	Y	Y	Y

Unknown hospital	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Hospital 57	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 58	—	—	—	—	—	—	Y	Y	Y
Hospital 59	—	—	—	—	—	—	Y	Y	Y
Hospital 60	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 61	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 62	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 63	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 64	—	—	—	—	—	Y	Y	Y	Y
Hospital 65	—	—	—	Y	Y	Y	Y	Y	Y
Hospital 66	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 67	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 68	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 69	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 70	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 71	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 72	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 73	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 74	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 75	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 76	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 77	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 78	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 79	—	—	—	Y	Y	Y	Y	Y	Y
Hospital 80	—	—	—	—	—	—	Y	Y	Y
Hospital 81	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 82	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 83	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 84	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 85	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 86	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 87	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 88	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 89	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 90	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 91	Y	Y	Y	Y	Y	Y	Y	Y	—
Hospital 92	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 93	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 94	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 95	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 96	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 97	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 98	—	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 99	—	—	—	—	—	—	Y	Y	Y
Hospital 100	—	—	Y	Y	Y	Y	Y	Y	Y

Unknown hospital	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Hospital 101	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 102	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 103	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 104	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 105	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 106	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 107	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 108	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 109	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 110	—	—	—	Y	Y	Y	Y	Y	Y
Hospital 111	—	—	Y	Y	Y	Y	Y	Y	Y
Hospital 112	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 113	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 114	—	—	—	—	—	Y	Y	Y	—
Hospital 115	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 116	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 117	Y	Y	Y	Y	Y	Y	—	—	—
Hospital 118	Y	Y	Y	Y	Y	Y	—	—	—
Hospital 119	Y	Y	Y	Y	Y	Y	—	—	—
Hospital 120	Y	Y	Y	Y	Y	—	—	—	—
Hospital 121	Y	Y	Y	Y	Y	—	—	—	—
Hospital 122	Y	Y	Y	Y	Y	—	—	—	—
Hospital 123	Y	Y	Y	—	—	—	—	—	—
Hospital 124	Y	Y	Y	—	—	—	—	—	—
Hospital 125	Y	Y	Y	—	—	—	—	—	—
Hospital 126	Y	Y	Y	—	—	—	—	—	—
Hospital 127	Y	Y	Y	—	—	—	—	—	—
Hospital 128	Y	Y	Y	—	—	—	—	—	—
Hospital 129	Y	Y	Y	—	—	—	—	—	—
Hospital 130	Y	Y	Y	—	—	—	—	—	—
Hospital 131	Y	Y	Y	—	—	—	—	—	—
Hospital 132	—	—	Y	—	—	—	—	—	—
Hospital 133	—	—	Y	—	—	—	—	—	—
Hospital 134	—	—	Y	—	—	—	—	—	—
Hospital 135	Y	Y	Y	—	—	—	—	—	—
Hospital 136	Y	Y	Y	—	—	—	—	—	—
Hospital 137	Y	Y	Y	—	—	—	—	—	—
Hospital 138	Y	Y	—	—	—	—	—	—	—
Hospital 139	Y	Y	—	—	—	—	—	—	—
Hospital 140	Y	Y	—	—	—	—	—	—	—
Hospital 141	Y	Y	—	—	—	—	—	—	—
Hospital 142	Y	Y	—	—	—	—	—	—	—
Hospital 143	Y	Y	—	—	—	—	—	—	—
Hospital 144	Y	Y	—	—	—	—	—	—	—

Unknown hospital	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Hospital 145	Y	Y	—	—	—	—	—	—	—
Hospital 146	Y	Y	—	—	—	—	—	—	—
Hospital 147	Y	Y	—	—	—	—	—	—	—
Hospital 148	Y	Y	—	—	—	—	—	—	—
Hospital 149	Y	Y	—	—	—	—	—	—	—
Hospital 150	Y	Y	—	—	—	—	—	—	—
Hospital 151	Y	Y	—	—	—	—	—	—	—
Hospital 152	Y	Y	—	—	—	—	—	—	—
Hospital 153	Y	Y	—	—	—	—	—	—	—
Hospital 154	Y	Y	—	—	—	—	—	—	—
Hospital 155	Y	Y	—	—	—	—	—	—	—
Hospital 156	Y	Y	—	—	—	—	—	—	—
Hospital 157	Y	Y	—	—	—	—	—	—	—
Hospital 158	Y	Y	—	—	—	—	—	—	—
Hospital 159	Y	—	—	—	—	—	—	—	—
Hospital 160	Y	—	—	—	—	—	—	—	—
Hospital 161	Y	—	—	—	—	—	—	—	—
Hospital 162	Y	—	—	—	—	—	—	—	—
Hospital 163	Y	—	—	—	—	—	—	—	—
Hospital 164	Y	—	—	—	—	—	—	—	—
Hospital 165	Y	—	—	—	—	—	—	—	—
Hospital 166	Y	—	—	—	—	—	—	—	—
Hospital 167	Y	—	—	—	—	—	—	—	—
Hospital 168	Y	—	—	—	—	—	—	—	—
Hospital 169 withdrawn	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 170 withdrawn	—	—	—	—	—	—	Y	Y	Y
Hospital 171 withdrawn	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 172 withdrawn	Y	Y	Y	Y	Y	Y	Y	—	—
Hospital 173 withdrawn	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 174 withdrawn	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 175 withdrawn	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hospital 176									Y
Hospital 177									Y
Hospital 178									Y
Hospital 179									Y
Hospital 180									Y
Hospital 184									Y
Hospital 185									Y
Hospital 194									Y
Hospital 198									Y
Hospital 199									Y
Hospital 200									Y
Hospital 201									Y
Hospital 202									Y

Unknown hospital	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Hospital 203									Y
Hospital 204									Y
Hospital 205									Y
Hospital 206									Y
Hospital 207									Y
Hospital 208									Y
Hospital 210									Y
Hospital 211									Y
Hospital 212									Y
Hospital 213									Y
Hospital 214									Y
Hospital 215									Y
Hospital 216									Y
Hospital 218									Y
Hospital 219									Y
Hospital 220									Y
Hospital 221									Y
Hospital 222									Y
Hospital 223									Y
Hospital 224									Y
Hospital 225									Y
Hospital 226									Y
Hospital 227									Y
Hospital 228									Y
Hospital 229									Y
Hospital 230									Y
Hospital 231									Y
Hospital 232									Y
Hospital 233									Y
Hospital 234									Y
Hospital 235									Y
Hospital 236									Y
Hospital 237									Y
Hospital 238									Y

Appendix E: List of the Agency for Healthcare Research and Quality's Inpatient Quality and Patient Safety Indicators used in The Fraser Institute *Hospital Report Card*

The indicators measured in the *Hospital Report Card* are classified into three groups: those related to medical conditions, hospital procedures, and child birth. The indicators are further classified by type: death rates, volumes of procedures, utilization rates and, adverse events. It should be noted that the indicators may vary in their computation according to the version of the AHRQ software. Version 2.1 was used for FY 1997 to 2004 whereas version 3.1 was used for FY 2005. Logs of the changes made between software versions are available at http://www.qualityindicators.ahrq.gov/downloads/iqi/iqi_change_log.pdf and http://www.qualityindicators.ahrq.gov/downloads/psi/psi_change_log.pdf.

A. Conditions

Death Rates

- [1] **Acute myocardial infarction (AMI) mortality rate (QI 15)** Deaths from heart attacks. Lower rates are more desirable.
- [2] **Acute myocardial infarction (AMI) mortality rate (without transfers) (QI 32)** Deaths from heart attacks; excludes patients that were transferred from another short term hospital. Lower rates are more desirable.
- [3] **Congestive heart failure (CHF) mortality rate (QI 16)** Deaths due to heart failure. Lower rates are more desirable.
- [4] **Acute Stroke mortality rate (QI 17)** Deaths from acute strokes. Lower rates are more desirable.
- [5] **Gastrointestinal hemorrhage mortality rate (QI 18)** Deaths due to bleeding from the esophagus, stomach, small intestine or colon. Lower rates are more desirable.
- [6] **Hip fracture mortality rate (QI 19)** Deaths due to hip fractures. Lower rates are more desirable.
- [7] **Pneumonia mortality rate (QI 20)** Death due to a condition involving an infection in the lungs. Lower rates are more desirable.
- [8] **Death in low mortality DRG (PSI 2)** Deaths among patients that are considered unlikely to die in the hospital. Lower rates are more desirable.
- [9] **Failure to Rescue (PSI 4)** Deaths in patients that developed specified complications of care during hospitalization. Lower rates are more desirable.

Adverse Events

These indicators focus on preventable instances of harm to patients such as complications arising from surgery.

- [1] **Decubitus ulcer (PSI 3)** Pressure sores that develop when a patient lies on his or her back for extended periods. Lower rates are more desirable.
- [2] **Iatrogenic pneumothorax (PSI 6)** The collapse of a patient's lung inadvertently induced by a physician or medical treatment. Lower rates are more desirable.
- [3] **Selected infections due to medical care (PSI 7)** Cases of infection due to medical care, primarily those related to intravenous (IV) lines and catheters. Lower rates are more desirable.
- [4] **Transfusion reaction (PSI 16)** Patients with blood transfusion reactions. Lower rates are more desirable.

B. Procedures

Death Rates

- [1] **Esophageal resection surgery mortality rate (QI 8)** Deaths due to the surgical removal of the tube that connects the mouth to the stomach, often due to esophageal cancer. Lower rates are more desirable.
- [2] **Pancreatic resection surgery mortality rate (QI 9)** Deaths due to the surgical removal of the pancreas, an organ that secretes many important hormones such as insulin, in an attempt to cure pancreatic cancer. Lower rates are more desirable.
- [3] **Abdominal Aortic Artery (AAA) Repair mortality rate (QI 11)** Deaths due to surgery performed to repair the major artery that carries blood from the heart to the lower part of the body. Lower rates are more desirable.
- [4] **Coronary Artery Bypass Graft (CABG) mortality rate (QI 12)** Deaths due to surgery performed to allow blood to bypass a clogged artery and allow it to carry oxygen to the heart. Lower rates are more desirable.
- [5] **Craniotomy mortality rate (QI 13)** Deaths due to the surgical opening of the skull that is performed to remove a brain tumor, repair an aneurysm (ballooning of blood vessels), perform a biopsy or to relieve pressure inside the skull. Lower rates are more desirable.
- [6] **Hip replacement mortality rate (QI 14)** Deaths due to hip replacement surgery. Lower rates are more desirable.
- [7] **Percutaneous Transluminal Coronary Angioplasty (PTCA) mortality rate (QI 30)** Deaths due to a non-surgical procedure performed to open blockages in the arteries that carry blood to the heart. Lower rates are more desirable.

- [8] **Carotid endarterectomy mortality rate (QI 31)** Deaths due to a procedure to that removes blockages from arteries in the neck to reduce the chance of stroke and brain damage. Lower rates are more desirable.

Volume of Procedures

These indicators are calculated because they reflect procedures for which evidence shows that hospitals performing more of certain highly complex procedures may have better outcomes for those procedures. Providers exceeding these thresholds are considered high volume providers. Please see Appendix F for further details on Volume of Procedures and their Thresholds.

- [1] **Esophageal resection surgery volume (IQI 1)** Numbers of procedures involving the surgical removal of the tube that connects the mouth to the stomach, often due to esophageal cancer. Numbers above 6 are more desirable. Please see Appendix F for details on Threshold values.
- [2] **Pancreatic resection surgery volume (IQI 2)** Numbers of procedures involving the surgical removal of the pancreas in an attempt to cure pancreatic cancer. Numbers above 10 are more desirable. Please see Appendix F for details on Threshold values.
- [3] **Abdominal Aortic Artery (AAA) Repair volume (IQI 4)** Numbers of procedures to repair the major artery carrying blood from the heart to the lower part of the body. Numbers above 10 are more desirable. Please see Appendix F for details on Threshold values.
- [4] **Coronary Artery Bypass Graft (CABG) volume (IQI 5)** Numbers of surgeries performed to allow blood to bypass a clogged artery. Numbers above 100 are more desirable. Please see Appendix F for details on Threshold values.
- [5] **Percutaneous Transluminal Coronary Angioplasty volume (PTCA) (IQI 6)** Number of procedures performed to open blockages in the arteries that carry blood to the heart. Numbers above 200 are more desirable. Please see Appendix F for details on Threshold values.
- [6] **Carotid endarterectomy volume (IQI 7)** Number of procedures performed to remove blockages from arteries in the neck to reduce the chance of stroke and brain damage. Numbers above 50 are more desirable. Please see Appendix F for details on Threshold values.

Utilization Rates

These indicators are calculated because they examine procedures whose use varies significantly across hospitals and for which questions have been raised about overuse, underuse, or misuse. High or low rates for these indicators are likely to represent inappropriate or inefficient delivery of care.

- [1] **Laparoscopic cholecystectomy (QI 23)** Minimally invasive removal of the gall bladder, a small pear-shaped sac that stores and concentrates bile, which is needed for digestion. Higher rates are more desirable.

- [2] **Incidental appendectomy among elderly (QI 24)** Removal of the appendix at the time of another necessary abdominal surgery. This procedure is performed to eliminate the risk of future appendicitis (inflammation of the appendix). Incidental appendectomy is generally not recommended in the elderly because they have both a lower risk for developing appendicitis and a higher risk of complications after surgery (calculated for patients 65 years or older). Lower rates are more desirable.
- [3] **Bi-lateral cardiac catheterization (QI 25)** A diagnostic test performed to see if the blood vessels to the heart are narrowed or blocked. Lower rates are more desirable.

Adverse Events

These indicators focus on preventable instances of harm to patients such as complications arising from surgery.

- [1] **Foreign body left during procedure (PSI 5)** Foreign object left in a patient during a procedure. Lower rates are more desirable.
- [2] **Post-operative hip fracture (PSI 8)** Hip fracture after surgery. Lower rates are more desirable.
- [3] **Post-operative hemorrhage or hematoma (PSI 9)** Bleeding after surgery. Lower rates are more desirable.
- [4] **Post-operative physiologic and metabolic derangements (PSI 10)** Development of disorders that interfere with biochemical processes within the body including kidney failure and diabetes occurring in patients after an elective surgery. Lower rates are more desirable.
- [5] **Post-operative respiratory failure (PSI 11)** Development of respiratory failure occurring in patients after undergoing elective surgery. Lower rates are more desirable.
- [6] **Post-operative pulmonary embolism or deep vein thrombosis (PSI 12)**
These conditions occur when a blood clot (usually formed in one of the leg veins) becomes detached and lodges in the lung artery or one of its branches (pulmonary embolism) or lodges in a another part of the body (usually the leg; deep vein thrombosis). This indicator is calculated for patients who develop these conditions after undergoing surgery. Lower rates are more desirable.
- [7] **Post-operative sepsis (PSI 13)** Patients that undergo elective surgeries and subsequently develop a hospital-acquired infection. Lower rates are more desirable.
- [8] **Post-operative wound dehiscence (PSI 14)** Parting of the layers of a surgical wound. Either the surface layers separate or the whole wound splits open. Lower rates are more desirable.
- [9] **Accidental puncture or laceration (PSI 15)** Accidental cut or wound during procedure. Lower rates are more desirable.

C. Obstetric (Birth-Related)

Utilization Rates

These indicators examine procedures whose use varies significantly across hospitals and for which questions have been raised about overuse, under-use, or misuse. High or low rates for these indicators are likely to represent inappropriate or inefficient delivery of care.

- [1] **Cesarean delivery (QI 21)** Surgical removal of a baby through the mother's abdomen. Lower rates are more desirable.
- [2] **Vaginal birth after cesarean (VBAC), uncomplicated (QI 22)** Rate of vaginal births that occurred for mothers who had delivered previously by Cesarean section. Higher rates are more desirable.
- [3] **Primary cesarean delivery (QI 33)** Surgical removal of a baby through the mother's abdomen during the first birth inclusively. Lower rates are more desirable.
- [4] **Vaginal birth after cesarean (VBAC), all (QI 34)** Rate of vaginal births that occurred to mothers who had delivered previously by Cesarean section. Higher rates are more desirable.

Adverse Events

These indicators focus on preventable instances of harm to patients such as complications arising from surgery.

- [1] **Birth trauma (PSI 17)** Birth trauma for infants born alive in a hospital. Lower rates are more desirable. [1]
- [2] **Obstetric trauma—vaginal with instrument (PSI 18)** Cases of potentially preventable trauma (4th degree lacerations, other obstetric lacerations) during vaginal delivery with an instrument. Lower rates are more desirable.
- [3] **Obstetric trauma—vaginal without instrument (PSI 19)** Cases of potentially preventable trauma (4th degree lacerations, other obstetric lacerations) during vaginal delivery without an instrument. Lower rates are more desirable.
- [4] **Obstetric trauma—cesarean section (PSI 20)** Cases of potentially preventable trauma (4th degree lacerations, other obstetric lacerations) during Cesarean delivery. Lower rates are more desirable.
- [5] **Obstetric trauma with 3rd degree—vaginal with instrument (PSI 27)** Cases of potentially preventable trauma (3rd and 4th degree lacerations, other obstetric lacerations) during vaginal delivery with an instrument. Lower rates are more desirable.
- [6] **Obstetric trauma with 3rd degree—vaginal without instrument (PSI 28)** Cases of potentially preventable trauma (3rd and 4th degree lacerations, other obstetric lacerations) during vaginal delivery without an instrument. Lower rates are more desirable.
- [7] **Obstetric trauma with 3rd degree—cesarean section (PSI 29)** Cases of potentially preventable trauma (3rd and 4th degree lacerations, other obstetric lacerations) during Cesarean delivery. Lower rates are more desirable.

[1] It has been brought to our attention that, due to imperfect equivalencies between ICD-10 and ICD-9 coding for birth trauma, some injuries to scalp not resulting from substandard care may have been included in the "Birth Trauma-Injury to Neonate" indicator (PSI-17) in The Fraser Institute's *Hospital Report Card: Ontario 2006*. It should be noted that the Canadian Institute for Health Information (CIHI) does not distinguish among types of injuries to scalp in the conversion tables for matching ICD-10 to ICD-9 coding and some codes may be questionable in their depiction of quality of care.

In a concern for accurate reflection of quality of care, all data pertaining to birth trauma were removed from the 2006 edition of the *Hospital Report Card*. This includes observed rates, risk-adjusted rates, scores, and rankings for birth trauma for all Ontario hospitals and municipalities for FY2002 to FY2004 (the years for which ICD-10 coding was used to classify facility activities in Ontario). Note that birth trauma was not included in the HMI composite measure and thus does not affect the rankings of hospitals based on that measure.

The *Hospital Report Card: Ontario 2008* includes a revised version of this indicator. Though the revised indicator is less comprehensive than that used previously, it will unambiguously reflect substandard care.

Appendix F: Calculating the Score, Rank, Hospital Mortality Index, and Rank of Hospital Mortality Index

1. Score

Each institution was given a score from 0 to 100 for each indicator based on its risk adjusted rate. The basis for this scoring is described below, as it varied slightly between types of indicators

Volume Indicators

Each volume indicator is supported by evidence suggesting that providers performing more than a certain number of procedures have better patients' outcomes. The thresholds are listed below. Threshold 1 is the lowest reported threshold in the literature, while threshold 2 is the highest. Providers exceeding these thresholds are considered high volume providers.

Volume Indicator	Threshold 1	Threshold 2	Reference for Threshold 1	Reference for Threshold 2
Esophageal resection (IQI 1)	6	7	Patti MG, Corvera CU, Glasgow RE, et al. A hospital's annual rate of esophagectomy influences the operative mortality rate. <i>J Gastrointest Surg</i> 1998; 2 (2): 186–92.	Dudley RA, Johansen KL, Rand R, et al. Selective referral to high-volume hospitals: estimating potentially avoidable deaths. <i>JAMA</i> 2000; 283 (9): 1159–66.
Pancreatic resection (IQI 2)	10	11	Glasgow RD, Mulvihill SJ. Hospital volume influences outcome in patients undergoing pancreatic resection for cancer. <i>West J Med</i> 1996; 165 (5): 294–300.	Glasgow, Mulvihill, 1996.
Abdominal Aortic Aneurysm Repair (AAA) (IQI 4)	10	32	Hannan EL, Kilburn H, Jr., O'Donnell JF, et al. A longitudinal analysis of the relationship between in-hospital mortality in New York state and the volume of abdominal aortic aneurysm surgeries performed. <i>Health Serv Res</i> 1992; 27 (4): 517–42.	Kazmers A, Jacobs L, Perkins A, et al. Abdominal aortic aneurysm repair in Veterans Affairs medical centers. <i>J Vasc Surg</i> 1996; 23 (2): 191–200.
Coronary Artery Bypass Surgery (CABG) (IQI 5)	100	200	Eagle KA, Guyton RA, Davidoff R, et al. ACC/AHA Guidelines for Coronary Artery Bypass Graft Surgery: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1991 Guidelines for Coronary Artery Bypass Graft Surgery). American College of Cardiology/American Heart Association. <i>J Am Coll Cardiol</i> 1999; 34 (4): 1262–347.	Hannan EL, Kilburn H, Jr., Bernard H, et al. Coronary artery bypass surgery: the relationship between inhospital mortality rate and surgical volume after controlling for clinical risk factors. <i>Med Care</i> 1991; 29 (11): 1094–107.

Volume Indicator	Threshold 1	Threshold 2	Reference for Threshold 1	Reference for Threshold 2
Percutaneous Transluminal Coronary Angioplasty (IQI 6)	200	400	Ryan TJ, Bauman WB, Kennedy JW, et al. Guidelines for percutaneous transluminal coronary angioplasty. A report of the American Heart Association/American College of Cardiology Task Force on Assessment of Diagnostic and Therapeutic Cardiovascular Procedures (Committee on Percutaneous Transluminal Coronary Angioplasty). <i>Circulation</i> 1993; 88 (6): 2987–3007.	Hannan EL, Racz M, Ryan TJ, et al. Coronary angioplasty volume-outcome relationships for hospitals and cardiologists. <i>JAMA</i> 1997; 277 (11): 892–98.
Carotid endarterectomy (IQI 7)	50	101	Manheim LM, Sohn MW, Feinglass J, et al. Hospital vascular surgery volume and procedure mortality rates in California, 1982-1994. <i>J Vasc Surg</i> 1998; 28 (1): 45–46.	Hannan EL, Popp AJ, Tranmer B, et al. Relationship between provider volume and mortality for carotid endarterectomies in New York state. <i>Stroke</i> 1998; 29 (11): 2292–97. Dudley RA, Johansen KL, Brand R, et al. Selective referral to high-volume hospitals: estimating potentially avoidable deaths. <i>JAMA</i> 2000; 283 (9): 1159–66.

Source: IQI SPSS Software documentation, version 2.1, version 4.

The scores for each volume indicator were calculated in the following manner. If the volume of procedures of a hospital did not exceed Threshold 1, a score of 0 was given. If the volume of procedures of a hospital exceeded Threshold 1 but did not exceed Threshold 2, a score of 75 was given. If the volume of procedures of a hospital exceeded Threshold 2, a score of 100 was given.

All Other Indicators

Institutions were given a score of 0 to 100 on all other indicators. The scores reflect the relative positions of their risk adjusted rates. For example, if the range of rates across hospitals for one of the indicators was from 1.0% to 4.0%, a score between 0 and 100 was created where 1.0% = 0 and 4.0% = 100. If an institution demonstrated a rate of 3.0% (the threshold of the top 1/3 of the range) then the score was 67. The following describes the calculation of the score.

Where the rate is better when it is higher, the score is the absolute difference between the rate and the minimum of the range, divided by the range. Where the rate is better when it is lower, the score is the absolute difference between the rate and the maximum of the range, divided by the range.

2. Rank

All institutions were ranked on each indicator based on their scores, where the highest rank of 1 corresponds to the highest score out of 100. [1]

[1] Volume indicators were not ranked since they have threshold requirements.

3. Hospital Mortality Index (HMI)

The HMI was created to allow examination of the overall performance of a hospital or municipality across several mortality indicators. The mortality indicators selected to create the HMI were those indicators that successfully passed through the following filters.

[1] Sample size Not all institutions contained DAD data required for all indicators since not all institutions perform all procedures or treat patients with all the medical conditions analyzed in the *Hospital Report Card*. For an indicator to be included in the HMI, hospitals representing at least 75% of the patient sample for that year had to have measured data. For example, in 2005/06 an indicator had to contain at least 824,770 records in order to be included in the HMI. [2] This ensured an adequate number of hospitals for comparison.

[2] Size bias PSIs measure very rare outcomes (i.e. 1 adverse event in 1000 or more discharges). Since smaller institutions perform fewer procedures, they are less likely to see these adverse events and may have artificially lower PSI rates. Therefore, only 2 PSIs were used in the HMI: Death in Low Mortality DRGs (PSI 2) and Failure to Rescue (PSI 4), neither of which appeared to be affected unduly by this size bias on careful examination of the data. [3]

[3] Sample coverage Some indicators could only be calculated accurately in either the ICD-9-CCP or ICD-10-CA/CCI periods, but not both (please refer to Appendix G for further details). With the sole exception of IQI 15, only indicators that were used in both classifications were used for calculation of the HMI. [4]

Only eight mortality indicators passed these filters from FY 1997 to FY 2001 and nine from FY 2002 to FY 2005. The mortality indicators included in the HMI are: hip replacement mortality (IQI 14), congestive heart failure mortality (IQI 16), acute stroke mortality (IQI 17), gastrointestinal hemorrhage mortality (IQI 18), hip fracture mortality (IQI 19), pneumonia mortality (IQI 20), low mortality DRGS (PSI 2) [5] and failure to rescue rates (PSI 4). [6] Acute Myocardial Infarction mortality (IQI 15) is included from 2002/03 to 2005/06 only.

4. Rank of the Hospital Mortality Index (HMI)

All institutions were ranked based on their HMI value, where the highest rank of 1 corresponds to the highest score out of 100.

[2] The total number of patient records in 2005/06 was 1,099,694.

[3] To further control for the size bias, an institution with a rate for Failure to Rescue = 0 was omitted from the HMI (since it is unlikely that an institution would have a rate = 0).

[4] IQI 15 remained in the HMI since sufficient coverage existed for this indicator and since AMI mortality rates are very commonly used as a measure of mortality.

[5] PSI 2 is no longer risk-adjusted in version 3.1 of the AHRQ software. The observed rate, rather than the risk-adjusted rate, of this measure was used for computation of the 2005/06 HMI.

[6] The HMI is not a comprehensive rating of overall inpatient care in a hospital setting but is a broad measure of mortality rates, which are likely the most accurately recorded patient outcome.

Appendix G: Indicators Omitted from This Report

Intrinsic differences between ICD-9-CCP and ICD-10-CA/CCI resulted in several indicators being reported on in either data coded in ICD-9-CCP (DAD data from FY1997 to FY2001) or data coded in ICD-10-CA/CCI (DAD data from FY2002 to FY2005), but not both.

A. Indicators Not Calculated from Data Coded in ICD-10-CA/CCI (2002/03 to 2005/06)

[1] AAA Volume/Mortality (IQI 4/11)

Conversion of the required ICD-10-CA/CCI diagnosis and procedure codes to ICD-9-CM for calculation of IQI 4 & 11 did not produce accurate results. This was caused by intrinsic differences between the classifications.

[2] PTCA Volume/Mortality (IQI 6/30) (2002/03 only)

The rates for IQI 6 & 30 in FY2002, the first year for ICD-10 coding in Ontario, were outliers when compared to rates in FY2003 and FY2004.

[3] Incidental Appendectomy among Elderly Utilization Rate (IQI 24)

The numerator of IQI 24 is composed of incidental appendectomy procedure codes: Incidental appendectomy (471), Laparoscopic incidental appendectomy (4711), and Other incidental appendectomy (4719). No ICD-10-CA/CCI codes translate directly into the required ICD-9-CM procedure codes.

[4] Bilateral Cardiac Catheterization Utilization Rate (IQI 25)

The numerator of IQI 25 is composed of the number of simultaneous right and left heart catheterizations: Right/Left heart cardiac catheterization (3723). No ICD-10-CA/CCI codes translate directly into the required ICD-9-CM procedure code.

[5] Post-operative Hip Fracture (PSI 8)

Conversion of the required ICD-10-CA/CCI diagnosis codes to ICD-9-CM for PSI 8 did not produce accurate results. This was caused by intrinsic differences between the classifications.

[6] Post-operative Hemorrhage or Hematoma (PSI 9)

Conversion of the required ICD-10-CA/CCI diagnosis codes to ICD-9-CM did not produce accurate results. This was caused by intrinsic differences between the classifications.

[7] Post-operative Pulmonary Embolism or Deep Vein Thrombosis (PSI 12)

Conversion of the required ICD-10-CA/CCI diagnosis codes to ICD-9-CM did not produce accurate results. This was caused by intrinsic differences between the classifications.

[8] Post-operative Wound Dehiscence (PSI 14)

The numerator of PSI 14 is composed of the number of discharges with an ICD-9-CM code for reclosure of postoperative disruption of the abdominal wall (5461) in any secondary procedure field. No ICD-10-CA/CCI codes translate directly into the required ICD-9-CM procedure code.

**[9] Obstetric Trauma with 3rd Degree—Vaginal with Instrument (PSI 27),
Obstetric Trauma with 3rd Degree—Vaginal without Instrument (PSI 28),
Obstetric Trauma with 3rd Degree—cesarean section (PSI 29) (2005/06 only)**

These three indicators were dropped in versions 3.0 and 3.1 of the AHRQ software and are thus not calculated for FY 2005.

**B. Indicators Not Calculated from Data Coded
in ICD-9-CCP (FY1997 to FY2001)**

[1] Acute Myocardial Infarction Mortality Rate (IQI 15 & 32)

ICD-9-CM is a more specific and updated coding classification than ICD-9-CCP. This results in numerous (more specific) ICD-9-CM codes mapping to a single (general) ICD-9-CCP code. For example, in ICD-9-CCP there is a single code that denotes an acute myocardial infarction (AMI) (410), compared to 30 more specific codes contained in ICD-9-CM, as shown in the following table.

ICD-9-CCP to ICD-9-CM conversion table

ICD-9-CCP	ICD-9-CM
410 AMI	41000 AMI ANTEROLATERAL WALL EPISODE NOS
410 AMI	41001 AMI ANTEROLATERAL WALL INIT EPISODE
410 AMI	41002 AMI ANTEROLATERAL WALL SUBSEQ EPISODE
410 AMI	41010 AMI OTHER ANT WALL EPISODE UNSPEC
410 AMI	41011 AMI OTHER ANT WALL INIT EPISODE
410 AMI	41012 AMI OTHER ANT WALL SUBSEQUENT EPISODE
410 AMI	41020 AMI INFEROLATERAL WALL EPISODE NOS
410 AMI	41021 AMI INFEROLATERAL WALL INIT EPISODE
410 AMI	41022 AMI INFEROLATERAL WALL SUBSEQUENT EPISODE
410 AMI	41030 AMI INFEROPOSTERAL WALL EPISODE NOS
410 AMI	41031 AMI INFEROPOSTERAL WALL INITIAL EPISODE
410 AMI	41032 AMI INFEROPOSTERAL WALL SUBSEQUENT EPISODE
410 AMI	41040 AMI OTH INFERIOR WALL EPISODE NOS
410 AMI	41041 AMI OTHER INFERIOR WALL INITIAL EPISODE
410 AMI	41042 AMI OTHER INFERIOR WALL SUBSEQUENT EPISODE
410 AMI	41050 AMI OTHER LATERAL WALL EPISODE UNSPECIFIED
410 AMI	41051 AMI OTHER LATERAL WALL INITIAL EPISODE
410 AMI	41052 AMI OTHER LATERAL WALL SUBSEQUENT EPISODE

410 AMI	41060 TRUE POSTERIOR WALL AMI EPISODE NOS
410 AMI	41061 TRUE POSTERIOR WALL AMI INITIAL EPISODE
410 AMI	41062 TRUE POSTERIOR WALL AMI SUBSEQUENT EPISODE
410 AMI	41070 SUBENDOCARDIAL AMI EPISODE NOS
410 AMI	41071 SUBENDOCARDIAL AMI INITIAL EPISODE
410 AMI	41072 SUBENDOCARDIAL AMI SUBSEQUENT EPISODE
410 AMI	41080 AMI OTHER SPECIFIED SITE EPISODE NOS
410 AMI	41081 AMI OTHER SPECIFIED SITE INITIAL EPISODE
410 AMI	41082 AMI OTHER SPECIFIED SITE SUBSEQUENT EPISODE
410 AMI	41090 AMI UNSPECIFIED SITE EPISODE UNSPECIFIED
410 AMI	41091 AMI UNSPECIFIED SITE INITIAL EPISODE
410 AMI	41092 AMI UNSPECIFIED SITE SUBSEQUENT EPISODE

The following ICD-9-CM AMI diagnosis codes are required for calculation of AMI mortality rate (IQIs 15 & 32).

ICD-9-CM diagnosis codes and descriptions for AMI

41001 AMI Anterolateral, Initial	41051 AMI Lateral NEC, Initial
41011 AMI Anterior Wall, Initial	41061 True Post Infarct, Initial
41021 AMI Inferolateral, Initial	41071 Subendo Infarct, Initial
41031 AMI Inferopost, Initial	41081 AMI NEC, Initial
41041 AMI Inferior Wall, Initial	41091 AMI NOS, Initial

It is not possible to separate out the information required for IQIs 15 and 32 (codes in ICD-9-CM) from the DAD (coded in ICD-9-CCP code 410). Therefore, IQIs 15 & 32 were omitted from our analysis.

[2] Cesarean Delivery Utilization Rate/Primary Cesarean Delivery Utilization Rate & Vaginal Birth After Cesarean (VBAC), All/Uncomplicated Utilization Rate (IQI 21/33 & IQI 22/34)

The calculation of IQIs 21/33, & 22/34 are based on the DRGs in the following table.

DRG number and description table

DRG	Description
370	CESAREAN SECTION W CC
371	CESAREAN SECTION W/O CC
372	VAGINAL DELIVERY W COMPLICATION
373	VAG DELIVERY W/O COMPLICATION
374	VAG DELIV W STERIL OR DC
375	VAG DELIV W OTH OR PROC

These DRGs are calculated by the CMS Diagnosis Related Group, which itself is based on the ICD-9-CM coding classification, and are based on the patient's principle diagnosis.

ICD-9-CM is a more specific coding classification than ICD-9-CCP. This results in numerous (more specific) ICD-9-CM codes mapping to a single (general) ICD-9-CCP code. In all cases where this occurred, the ICD-9-CCP code was translated to the Unspecified/Not Otherwise Specified [1] ICD-9-CM code (please refer to Appendix J part B for further details on translating between ICD-9-CCP and ICD-9-CM).

When this translation was performed on the diagnosis codes required for DRGs 370-375, the CMS software produced DRG 469 (illogical primary diagnosis) instead. This is because the software does not recognize these “Unspecified/Not Otherwise Specified” codes in the primary diagnosis field. Since the definitions of IQIs 21, 22, 33, and 34 are dependent on DRGs 370-375, these indicators were omitted from our analysis.

[3] Obstetric Trauma—Vaginal Delivery with Instrument/Obstetric Trauma with 3rd Degree—Vaginal with Instrument (PSI 18/27)

The denominators of PSIs 18 & 27 are partially based on the DRGs in the following table.

DRG number and description table

DRG	Description
372	VAGINAL DELIVERY W COMPLICATION
373	VAG DELIVERY W/O COMPLICATION
374	VAG DELIV W STERIL OR DC
375	VAG DELIV W OTH OR PROC

These DRGs are calculated by the CMS Diagnosis Related Grouper and are based on the patient’s principle diagnosis.

ICD-9-CM is a more specific coding classification than ICD-9-CCP. This results in numerous (more specific) ICD-9-CM codes mapping to a single (general) ICD-9-CCP code. In all cases where this occurred, the ICD-9-CCP code was translated to the Unspecified/Not Otherwise Specified [2] ICD-9-CM code (please refer to Appendix J part B for further details on translating between ICD-9-CCP and ICD-9-CM).

When this translation was performed on the diagnosis codes required for DRGs 370-375, the CMS software produced DRG 469 (illogical primary diagnosis) instead. This is because the software does not recognize these “Unspecified/Not Otherwise Specified” codes in the primary diagnosis field. Since the definitions of PSIs 18 & 27 are dependent on DRGs 372-375, these indicators were omitted from our analysis.

[1] ICD-9-CM contains several conventions including “NOS” or “Not otherwise specified” (usually a code with a 4th digit 9 or 5th digit 0 for diagnosis codes). They are for use when the information in the medical record is insufficient to assign a more specific code.

[2] ICD-9-CM contains several conventions including “NOS” or “Not otherwise specified” (usually a code with a 4th digit 9 or 5th digit 0 for diagnosis codes). They are for use when the information in the medical record is insufficient to assign a more specific code.

[4] Obstetric Trauma—Vaginal Delivery without Instrument/Obstetric Trauma with 3rd Degree—Vaginal with Instrument (PSI 19/28)

The denominators of PSIs 19 & 28 are partially based on the DRGs in the following table.

DRG number and description table

DRG	Description
372	VAGINAL DELIVERY W COMPLICATION
373	VAG DELIVERY W/O COMPLICATION
374	VAG DELIV W STERIL OR DC
375	VAG DELIV W OTH OR PROC

These DRGs are calculated by the CMS Diagnosis Related Grouper and are based on the patient's principle diagnosis.

ICD-9-CM is a more specific coding classification than ICD-9-CCP. This results in numerous (more specific) ICD-9-CM codes mapping to a single (general) ICD-9-CCP code. In all cases where this occurred, the ICD-9-CCP code was translated to the Unspecified/Not Otherwise Specified [3] ICD-9-CM code (please refer to Appendix J part B for further details on translating between ICD-9-CCP and ICD-9-CM).

When this translation was performed on the diagnosis codes required for DRGs 370-375, the CMS software produced DRG 469 (illogical primary diagnosis) instead. This is because the software does not recognize these "Unspecified/Not Otherwise Specified" codes in the primary diagnosis field. Since the definitions of PSIs 19 & 28 are dependent on DRG 372-375, these indicators were omitted from our analysis.

[3] ICD-9-CM contains several conventions including "NOS" or "Not otherwise specified" (usually a code with a 4th digit 9 or 5th digit 0 for diagnosis codes). They are for use when the information in the medical record is insufficient to assign a more specific code.

[5] Obstetric Trauma—Cesarean Section/Obstetric Trauma with 3rd Degree—Cesarean Section (PSI 20/29)

The denominators of PSIs 20 & 29 are partially based on the DRGs in the following table:

DRG number and description table

DRG	Description
372	VAGINAL DELIVERY W COMPLICATION
373	VAG DELIVERY W/O COMPLICATION
374	VAG DELIV W STERIL OR DC
375	VAG DELIV W OTH OR PROC

These DRGs are calculated by the CMS Diagnosis Related Grouper and are based on the patient's principle diagnosis.

ICD-9-CM is a more specific coding classification than ICD-9-CCP. This results in numerous (more specific) ICD-9-CM codes mapping to a single (general) ICD-9-CCP code. In all cases where this occurred, the ICD-9-CCP code was translated to the Unspecified/Not Otherwise Specified [4] ICD-9-CM code (please refer to Appendix J part B for further details on translating between ICD-9-CCP and ICD-9-CM).

[4] ICD-9-CM contains several conventions including "NOS" or "Not otherwise specified" (usually a code with a 4th digit 9 or 5th digit 0 for diagnosis codes). They are for use when the information in the medical record is insufficient to assign a more specific code.

When this translation was performed on the diagnosis codes required for DRGs 370-375, the CMS software produced DRG 469 (Illogical primary diagnosis) instead. This is because the software does not recognize these “Unspecified/ Not Otherwise Specified” codes in the primary diagnosis field. Since the definitions of PSIs 20 & 29 are dependent on DRGs 372-375, these indicators were omitted from our analysis.

[6] Iatrogenic Pneumothorax (PSI 6)

The numerator of PSI 6 is composed of discharges with ICD-9-CM code of 5121 (Iatrogenic Pneumothorax) in any secondary diagnosis field. [5] As is shown in the table below, ICD-9-CM contains three codes related to conditions of the pneumothorax, while ICD-9-CCP contains only one.

ICD-9-CCP to ICD-9-CM conversion table

ICD-9-CCP	ICD-9-CM
512 Pneumothorax	5120 Spontaneous tension pneumothorax
512 Pneumothorax	5121 Iatrogenic pneumothorax
512 Pneumothorax	5128 Other spontaneous pneumothorax

[5] There are 16 diagnosis fields per patient in the DAD from 1997/98 to 2001/02 and 25 diagnosis fields per patient in the DAD from 2002/03 to 2005/06. The ICD diagnosis code in the primary field identifies the morbidity considered to be the most responsible for the patient during hospitalization. A secondary diagnosis field refers to any field that is not the primary diagnosis field.

Since it is not possible to isolate patients with ICD-9-CM code 5121 in the DAD data from CIHI, PSI 6 was omitted for data coded in ICD-9-CCP.

[7] Postoperative respiratory failure (PSI 11)

The numerator of PSI 11 is composed of discharges with the ICD-9-CM code for acute respiratory failure (51881) in any secondary diagnosis field. As is shown in the table below, ICD-9-CM contains four codes related to conditions of respiratory failure, while ICD-9-CCP contains only one.

ICD-9-CCP to ICD-9-CM conversion table

ICD-9-CCP	ICD-9-CM
7991 Respiratory Failure	51884 Acute and Chronic Respiratory Failure
7991 Respiratory Failure	51881 Acute Respiratory Failure
7991 Respiratory Failure	51883 Chronic Respiratory Failure
7991 Respiratory Failure	7991 Respiratory Arrest

Since it is not possible to isolate patients with ICD-9-CM code 7991 in the DAD data from CIHI, PSI 11 was omitted for data coded in ICD-9-CCP.

Appendix H: Municipalities and Corresponding Patient Forward Sortation Areas (FSAs)

Postal Codes were truncated to Forward Sortation Areas (FSAs) prior to The Fraser Institute accessing the dataset. All patient FSAs were grouped into corresponding municipalities as described by Canada Post for 2005/06 as follows. [1]

Municipality	FSA
ACTON	L7J
AJAX	L1S, L1T, L1Z
ALLISTON	L9R
AMHERSTBURG	N9V
ARNPRIOR	K7S
AURORA	L4G
AYLMER WEST	N5H
BARRIE	L4M, L4N
BELLEVILLE	K8N, K8P, K8R
BOLTON	L7E
BOWMANVILLE	L1B, L1C, L1E
BRACEBRIDGE	P1L
BRADFORD	L3Z
BRAMPTON	L6V, L6W, L6S, L6T, L6X, L6Y, L6Z, L7A, L6P, L6R
BRANTFORD	N3P, N3R, N3S, N3T, N3V
BROCKVILLE	K6T, K6V
BURLINGTON	L7L, L7N, L7R, L7S, L7T, L7M, L7P
CALEDON	L7C, L7K
CALEDONIA	N3W
CAMBRIDGE	N1P, N1R, N1S, N1T, N3C, N3E, N3H
CARLETON PLACE	K7C
CHATHAM	N7L, N7M
COBOURG	K9A
COLLINGWOOD	L9Y

[1] All FSAs containing a "0" as their second character were grouped into a "Rural" category (as described by Canada Post). All FSAs not described by Canada Post were placed in a residual group (i.e. "Other").

Municipality	FSA
CONCORD	L4K
CORNWALL	K6H, K6J, K6K
CUMBERLAND	K4C
DELHI	N4B
DOWNSVIEW	M3J, M3K, M3L, M3M, M3H, M3N
DRYDEN	P8N
DUNNVILLE	N1A
EAST GWILLIMBURY	L9N
ELLIOT LAKE	P5A
ELMIRA	N3B
ESPANOLA	P5E
ESSEX	N8M
ETOBICOKE	M9W , M9V, M8V, M8W, M9C, M8X, M9A, M9B, M8Y, M8Z
FERGUS	N1M
FORT ERIE	L2A
FORT FRANCES	P9A
GANANOQUE	K7G
GARSON	P3L
GEORGETOWN	L7G
GODERICH	N7A
GRAVENHURST	P1P
GREELY	K4P
GRIMSBY	L3M
GUELPH	N1C, N1E, N1G, N1H, N1K, N1L
HAMILTON	L9H, L8M, L8N, L8P, L8R, L8S, L8T, L8V, L8W, L8E, L8G, L8J, L9G, L9K, L9A, L9B, L9C, L8H, L8K
HANMER	P3P
HANOVER	N4N
HAWKESBURY	K6A
HUNTSVILLE	P1H

Municipality	FSA
INGERSOLL	N5C
INNISFIL	L9S
KAPUSKASING	P5N
KENORA	P9N
KESWICK	L4P
KINCARDINE	N2Z
KING CITY	L7B
KINGSTON	K7M, K7N, K7P, K7K, K7L
KINGSVILLE	N9Y
KIRKLAND LAKE	P2N
KITCHENER	N2J, N2L, N2T, N2V, N2A, N2C, N2B, N2G, N2H, N2K, N2E, N2M, N2N, N2R
LEAMINGTON	N8H
LINDSAY	K9V
LISTOWEL	N4W
LIVELY	P3Y
LONDON	N5Z, N6A, N6B, N5V, N5W, N5X, N5Y, N6M, N6J, N6K, N6P, N6G, N6H, N6C, N6E, N6L, N6N
MANOTICK	K4M
MAPLE	L6A
MARKHAM	L3P, L3R, L6C, L6G, L3S, L6B, L6E
MEAFORD	N4L
MIDLAND	L4R
MILTON	L9T
MISSISSAUGA	L5J, L5C, L5K, L5L, L4T, L4V, L5S, L5T, L5E, L5G, L5H, L5P, L5M, L4W, L4X, L4Y, L5N, L5W, L5A, L5B, L4Z, L5R, L5V
NAPANEE	K7R
NAVAN	K4B
NEW HAMBURG	N3A
NEWMARKET	L3X, L3Y
NIAGARA FALLS	L2E, L2G, L2H, L2J

Municipality	FSA
NORTH BAY	P1A, P1B, P1C
NORTH YORK	M3A, M3B, M3C
OAKVILLE	L6H, L6J, L6K, L6L, L6M
ORANGEVILLE	L9V, L9W
ORILLIA	L3V
OSHAWA	L1G, L1H, L1J, L1K, L1L
OTTAWA	K2K, K2L, K2M, K2W, K2H, K1C, K1E, K1W, K1Y, K1Z, K1A, K2A, K2B, K1B, K1G, K1H, K1X, K1J, K1K, K4A, K1L, K1M, K1N, K2S, K2T, K2V, K2C, K2E, K2G, K2J, K2R, K1P, K1R, K2P, K1S, K1T, K1V
OWEN SOUND	N4K
PARIS	N3L (previously sorted to Brantford)
PARRY SOUND	P2A
PEMBROKE	K8A, K8B
PENETANGUISHENE	L9M
PERTH	K7H
PETAWAWA	K8H
PETERBOROUGH	K9H, K9J, K9K, K9L
PICKERING	L1V, L1W, L1X, L1Y
PORT COLBORNE	L3K
PORT HOPE	L1A
PORT PERRY	L9L
PORT STANLEY	N5L
RENFREW	K7V
RICHMOND HILL	L4C, L4E, L4S, L4B
ROCKLAND	K4K
RUSSELL	K4R
SARNIA	N7S, N7T, N7V, N7W, N7X
SAULT STE MARIE	P6A, P6B, P6C
SCARBOROUGH	M1P, M1R, M1T, M1W, M1G, M1H, M1J, M1K, M1L, M1M, M1N, M1S, M1V, M1X, M1B, M1C, M1E
SIMCOE	N3Y

Municipality	FSA
SHOUBERTON	P8T
SMITHS FALLS	K7A
ST CATHARINES	L2M, L2N, L2W L2P, L2R, L2S, L2T, L2V
ST MARYS	N4X
ST THOMAS	N5P, N5R
STOUFFVILLE	L4A
STRATFORD	N4Z, N5A
STRATHROY	N7G
STURGEON FALLS	P2B
SUDBURY	P3A, P3B, P3C, P3E, P3G
THORNHILL	L3T, L4J
THUNDER BAY	P7C, P7E, P7J, P7K, P7A, P7B, P7G
TILLSONBURG	N4G
TIMMINS	P4N, P4P, P4R
TORONTO	M2P, M4A, M4B, M6L, M6M, M5W, M6J, M6K, M6R, M5L, M6N, M6P, M6G, M6H, M4L, M4M, M4C, M4E, M4J, M4K, M4N, M4P, M4R, M5P, M6C, M6E, M5R, M5S, M7A, M4G, M4H, M5M, M5N, M6A, M6B, M5K, M5X, M4X, M5A, M4Y, M4W, M4S, M4T, M4V, M5H, M5J, M5B, M5C, M5E, M5G, M6S
TRENTON	K8V
UXBRIDGE	L9P
VAL CARON	P3N
WALLACEBURG	N8A
WASAGA BEACH	L9Z
WELLAND	L3B, L3C
WESTON	M9N, M9P, M9R, M9L, M9M
WHITBY	L1M, L1N, L1P, L1R
WILLOWDALE	M2K, M2L, M2R, M2H, M2J, M2M, M2N
WINDSOR	N8N, N8P, N9K, N8S, N8T, N9E, N9J, N8X, N9A, N9B, N9C, N8R, N8V, N8W, N8Y, N9G, N9H
WOODBURGH	L4H, L4L
WOODSTOCK	N4S, N4T, N4V

Appendix I: Codes for Age

Age is coded somewhat differently in the DAD (Discharge Abstracts Database), grouper software (CMS- and 3M™ APR™ DRG Classification System for FY 1997 thru 2004 and CMS Grouper with Medicare Code Editor for FY 2005), and AHRQ IQI (Inpatient Quality Indicator) and PSI (Patient Safety Indicator) modules.

A. Age in DAD

[1] Age code. Denotes how the patient's age is recorded

- [a] Y = age in years. Patient is 2 years or older.
- [b] E = age is estimated in years. Patient is 2 years or older.
- [c] M = age in months. Patient is less than 2 years.
- [d] D = age in days. Patient is less than 31 days.
- [e] B = age recorded for Newborns/Stillborns.
- [f] U = age unknown.

[2] Age units. Denotes the age of patient at time of admission.

- [a] If "Age Code" = "B", "Age Units" is:
 - [i] NB = Newborn
 - [ii] SB = Stillbirth
 - [iii] U = Unknown
- [b] All other values in "Age Units" correspond to the age of the patient expressed as a numeric value (000-999). This information was used in conjunction with the "Age Code" field as follows:
 - [i] If the age of the patient is less than 31 days, the value is expressed in days.
 - [ii] If the age of the patient is less than 2 years, the value is expressed in months.
 - [iii] If the age of the patient is 2 years or more the value is expressed in years.

Note: In order to separate stillbirths from newborns (all are coded as "Age Code" = "B"), patients with "Age Code" = "B" were cross-referenced with the DAD field "Entry code" = "S". Stillbirths were omitted from analysis.

B. Age Requirements for the CMS- and 3M™ APR™ DRG Classification System software [1]

[1] AgeY. Age at admission in years (0–124)

- [a] Birth date must be \leq admit date

[2] AgeD. (1–365)

- [a] Used only when age in years = 0
- [b] If admit date = birth date, then the calculated age in days = 1

[1] Only age in years was required for the CMS Grouper with Medicare Code Editor.

In order to accommodate the differences in how the age of a patient is captured in the DAD and that required by the CMS- and 3M™ APR™ DRG Classification System software, the two DAD fields (“Age code” and “Age Units”) were split into the required “Age in years” and “Age in days” fields. Patients ≤ 31 days (corresponding to “D” in “Age code”) were separated into the “Age in days” field. The number of months from the DAD was multiplied by 30 days if a patient was 1 to 12 months old. Patients between 1 and 2 years were defined as “Age in years” = 1. Patients with “Age code = B” that were not stillbirths (denoted by “S” in the “Entry code” field) were defined as “Age in days” = 1.

C. Age Requirements for AHRQ IQI and PSI modules

The DAD data was translated as described above (for the CMS- and 3M™ APR™ DRG Classification System software) with the following exceptions.

- [1] Patients less than one year are placed in the “Ageday” category.
- [2] If admit date = birth date, then the calculated age in days = 0.

Appendix J: International Classification of Diseases (ICD) conversion tables

Note: The same methodological approach was applied to the Intervention codes (CCI).

In order to use the CMS- and 3M™ APR™ DRG Classification System software as well as the AHRQ IQI and PSI modules, all diagnoses and procedures were converted to ICD-9-CM codes preceding analysis. Data from the DAD were delivered in two coding classifications, ICD-9-CCP (1997/98 to 2001/02) and ICD-10-CA/CCI (2002/03 to 2005/06).

A. ICD-10-CA/CCI conversion methodology

The following modifications were made to our database.

[1] Conversion tables for ICD-10-CA/CCI to ICD-9-CM were purchased from CIHI and applied to the DAD database.

[2] The National Center for Health Statistics (NCHS) and the Centers for Medicare & Medicaid Services (CMS) have issued new diagnosis and procedure codes for the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) every year since 1986. New code assignments are the result of year-long efforts of the ICD-9-CM Coordination and Maintenance Committee, which is sponsored jointly by NCHS and CMS. The effective date for issuing new codes is the same every year, October 1. [1]

Until ICD-10-CA/CCI was adopted in Canada (in FY2002), many Canadian hospitals were using ICD-9-CM. As such, CIHI continually updated the ICD-9-CM codes produced by NCHS in Washington each year until 1999. Since the present study used data coded in ICD-10-CA/CCI for FY2002 to FY2005, the corresponding ICD-9-CM codes were updated. This information was extracted from the National Center for Health Statistics (NCHS).

[1] Source: <<http://www.cdc.gov/nchs/data/ICD-9/icdcnv06.pdf>>.

[3] Since converting ICD-10-CA/CCI to ICD-9-CM is a necessarily imperfect process as a result of changes in the way many diseases/conditions are handled, CIHI assigns grades to describe the quality of each conversion, where: [2]

- 1 = Good to excellent match; both coding systems are either identical or the ICD-10-CA/CCI terms are indexed to the ICD-9-CM.
- 2 = Fair match; the ICD-10-CA/CCI code is not indexed in the same manner in ICD-9-CM. An inclusion term may be present, which has influenced the choice but generally some default decision was made, with the typical default to the “other specified” category.
- 3 = Poor match. There is no specific code available; for example, the ICD-10-CA/CCI code represents a new concept that was not available in the previous classification.

[2] Source: Conversion Tables Fiscal 2003/04 and 2005/06 received from CIHI.

Only two ICD-10-CA/CCI codes analysed by the AHRQ IQI & PSI indicators are classified as a “3” conversion. They are:

- [1] S130 (Trauma ruptured cervical intervertebral disc) to 83900 (Cervical Vertebra Dislocation Unspecified). Required for calculating PSIs 2, 6, and 8.
- [2] G463 (Brain stem stroke syndrome) to 34489 (Other specified paralytic syndrome). Required for calculating PSI 3.

[4] As previously mentioned, ICD-10-CA/CCI is a more specific and updated coding classification than ICD-9-CM. Therefore, numerous ICD-10-CA/CCI codes can map to a single ICD-9-CM code. Alternatively, there may be some codes where there is no direct translation from ICD-10-CA/CCI to ICD-9-CM.

All ICD-9-CM codes that did not translate directly from ICD-10-CA were analysed individually with respect to which indicator(s) they appeared in and where the code was located (i.e. in the numerator, denominator, both, or in the exclusions of a given indicator).

In cases where CIHI provided no translation, the WHO’s *International Statistical Classification of Diseases and Related Health Problems*, 10th Revision, Tabular List of inclusions and four-character subcategories [3] and the Incidence and Prevalence Database ICD-9 and ICD-10 conversion [4] were used to determine whether other ICD-10-CCI codes translated to ICD-9-CM contained equivalent information to that required by the AHRQ indicator.

For example, 00322 (ICD-9-CM—Salmonella Pneumonia) is one of the codes required for calculation of the Pneumonia Mortality Rate (IQI 20). None of the ICD-10-CA/CCI codes listed in CIHI’s conversion table translates directly to 00322. However, there are two ICD-10-CA/CCI codes that would contain this information that do translate to ICD-9-CM codes.

[3] Available at <<http://www.who.int/classifications/apps/icd/icd10online/>>.

[4] Available at <<http://www.tdrdata.com>>.

ICD-10-CA to ICD-9-CM code conversion table

ICD-10-CA	ICD-9-CM
A022 Localized salmonella infections	00329 Other localized Salmonella infections
J170 Pneumonia in bacterial disease classified elsewhere	4848 Pneumonia in other infection diseases

Since 4848 is one of the ICD-9-CM codes analysed to calculate IQI 20, the information for Salmonella Pneumonia is already captured within the indicator. Additionally, since this indicator measures deaths due to pneumonia infection, using the information contained in A022 (Localized salmonella infections), the conversion to 00329 (Other localized Salmonella infections) would be inappropriate as it would include information about Salmonella infections that was not specific to Pneumonia infection.

This exercise was performed to ensure that the proper information contained within the ICD-10-CA/CCI codes was being captured by a given indicator, even in the absence of a direct ICD-10-CA to ICD-9-CM translation.

[5] As previously mentioned, the AHRQ indicators require CMS- and 3M™ APR™ DRGs to produce a risk adjusted rate for a given IQI. However, when the translations in the following table were performed, the CMS- and 3M™ APR™ DRG Classification System Groupers produced an error message indicating a mismatch between the diagnosis code and birth-weight combination. The error only occurred when, for example, P070 was converted to 76503 but with a birth-weight of less than 750g.

ICD-10-CA to ICD-9-CM code conversion table

ICD-10-CA	ICD-9-CM
P070 Extremely low birth weight; less than 999g	76503 Extreme immaturity 750-999g
P071 Other low birth weight; 1000–2499g	76518 Preterm infants 2000-2499g
P072 Extreme immaturity	76500 Immaturity, weight unspecified
P073 Other preterm infants	76510 Preterm infants, weight unspecified
P0590 Symmetric intrauterine growth restriction	76490 Fetal growth retarded, weight unspecified
P0591 Asymmetric intrauterine growth restriction	76490 Fetal growth retarded, weight unspecified
P0599 Unspecified intrauterine growth restriction	76490 Fetal growth retarded, weight unspecified

In order to avoid losing the information contained within these ICD-10-CA codes, the codes were translated as follows.

ICD-10-CA to ICD-9-CM code conversion table

ICD-10-CA	ICD-9-CM
P070 Extremely low birth weight	765.01 Extreme Immaturity <500g
	765.02 Extreme Immaturity 500-749g
	765.03 Extreme Immaturity 750-999g
P071 Other low birth weight; 1000-2499g	765.14 Preterm NEC 1000-1249g
	765.15 Preterm NEC 1250-1499g
	765.16 Preterm infant NEC 1500-1749 g
	765.17 Preterm NEC 1750-1999g
	765.18 Preterm infant NEC 2000-2499 g
P072 Extreme immaturity	765.01 Extreme Immaturity <500g
	765.02 Extreme Immaturity 500-749g
	765.03 Extreme Immaturity 750-999g
	765.04 Extreme Immaturity 1000-1249g

NEC = not otherwise classified/other.

ICD-10-CA	ICD-9-CM	
	765.05 Extreme Immaturity 1250-1499g	
	765.06 Extreme Immaturity 1500-1749g	
	765.07 Extreme Immaturity 1750-1999g	
	765.08 Extreme Immaturity 2000-2499g	
	765.09 Extreme Immaturity 2500+g	
	765.00 Extreme Immaturity Weight NOS	
P073 Other preterm infants		NOS = not otherwise specified/unspecific (weight is unknown or missing)
	765.10 Other preterm infants Weight NOS	
	765.16 Other preterm infants NEC 1500-1749 grams	
	765.18 Other preterm infants NEC 2000-2499 grams	
	765.19 Other preterm infants NEC 2500+ grams	
	765.11 Other preterm infants <500g	
	765.12 Other preterm infants 500-749g	
	765.13 Other preterm infants 750-999g	
	765.14 Other preterm infants 1000-1249g	
	765.15 Other preterm infants 1250-1499g	
	765.17 Other preterm infants 1750-1999g	
P0590 Symmetric intrauterine growth restriction		
	764.91 Fetal growth retarded <500g	
	764.92 Fetal growth retarded 500-749g	
	764.93 Fetal growth retarded 750-999g	
	764.94 Fetal growth retarded 1000-1249g	
	764.95 Fetal growth retarded 1250-1499g	
	764.96 Fetal growth retarded 1500-1749g	
	764.97 Fetal growth retarded 1750-1999g	
	764.98 Fetal growth retarded 2000-2499g	
	764.99 Fetal growth retarded 2500+g	
	764.90 Fetal growth retard weight NOS	
P0591 Asymmetric intrauterine growth restriction		
	764.91 Fetal growth retarded <500g	
	764.92 Fetal growth retarded 500-749g	
	764.93 Fetal growth retarded 750-999g	
	764.94 Fetal growth retarded 1000-1249g	
	764.95 Fetal growth retarded 1250-1499g	
	764.96 Fetal growth retarded 1500-1749g	
	764.97 Fetal growth retarded 1750-1999g	
	764.98 Fetal growth retarded 2000-2499g	
	764.99 Fetal growth retarded 2500+g	
	764.90 Fetal growth retard weight NOS	
P0599 Unspecified intrauterine growth restriction		
	764.91 Fetal growth retarded <500g	
	764.92 Fetal growth retarded 500-749g	
	764.93 Fetal growth retarded 750-999g	
	764.94 Fetal growth retarded 1000-1249g	

ICD-10-CA	ICD-9-CM
	764.95 Fetal growth retarded 1250-1499g
	764.96 Fetal growth retarded 1500-1749g
	764.97 Fetal growth retarded 1750-1999g
	764.98 Fetal growth retarded 2000-2499g
	764.99 Fetal growth retarded 2500+g
	764.90 Fetal growth retard weight NOS

[6] ICD-10-CA/CCI is a more specific and updated coding classification than ICD-9-CM. Therefore, numerous ICD-10-CA/CCI codes can map to a single ICD-9-CM code. Alternatively, some codes do not translate directly from ICD-10-CA/CCI to ICD-9-CM. The following table contains the ICD-9CM diagnosis codes required for calculating Congestive Heart Failure (IQI 16). The italicized codes (39891 to 40493) do not translate directly from ICD-10-CA/CCI to ICD-9-CM.

ICD-9-CM codes required for calculation of Congestive Heart Failure mortality rate (IQI 16)

Code	Description	Code	Description
<i>39891</i>	<i>RHEUMATIC HEART FAILURE</i>	42821	Acute Systolic Heart Failure
<i>40201</i>	<i>MAL HYPERT HRT DIS W CHF</i>	42822	Chronic Systolic Heart Failure
<i>40211</i>	<i>BENIGN HYP HRT DIS W CHF</i>	42823	Acute On Chronic Systolic Heart Failure
<i>40291</i>	<i>HYPERTEN HEART DIS W CHF</i>	4289	Heart Failure NOS
<i>40401</i>	<i>MAL HYPER HRT/REN W CHF</i>	42830	Diastolic Heart Failure NOS
<i>40403</i>	<i>MAL HYP HRT/REN W CHF&RF</i>	42831	Acute Diastolic Heart Failure
<i>40411</i>	<i>BEN HYPER HRT/REN W CHF</i>	42832	Chronic Diastolic Heart Failure
<i>40413</i>	<i>BEN HYP HRT/REN W CHF&RF</i>	42833	Acute On Chronic Diastolic Heart Failure
<i>40491</i>	<i>HYPER HRT/REN NOS W CHF</i>	42840	Systolic/Diastolic Heart Failure NOS
<i>40493</i>	<i>HYP HT/REN NOS W CHF&RF</i>	42841	Acute Systolic/Diastolic Heart Failure
4280	Congestive Heart Failure	42842	Chronic Systolic/Diastolic Heart Failure
4281	Left Heart Failure	42843	Acute/Chronic Systolic/Diastolic Heart Failure
42820	Systolic Heart Failure NOS		

Although a direct translation does not exist from an ICD-10-CA code to an ICD-9-CM code, equivalent information can be found in other ICD-10-CA/CCI codes. For example, Rheumatic Heart Failure (ICD-9-CM code 39891) information is contained in ICD-10-CA code I099 (Rheumatic heart disease, unspecified). However, since this is an “unspecified” code, information that is not specific to Chronic Heart Failure Mortality (IQI 16) will also be contained in this code.

For this reason, calculation of IQI 16 was restricted to codes: 4280, 4281, 42820, 42821, 42822, 42823, 4289, 42830, 42831, 42832, 42833, 42840, 42841, 42842 and 42843 for data coded in ICD-10-CA/CCI.

[7] The following ICD-9-CM codes are required for calculation of Acute Myocardial Infarction Mortality (IQIs 15 & 32).

ICD-9-CM codes required for calculation of Acute Myocardial Infarction mortality rate (IQIs 15 & 32)

Code	Description	Code	Description
41001	AMI Anterolateral, Initial	41051	AMI Lateral NEC, Initial
41011	AMI Anterior Wall, Initial	41061	True Post Infarct, Initial
41021	AMI Inferolateral, Initial	41071	Subendo Infarct, Initial
41031	AMI Inferopost, Initial	41081	AMI NEC, Initial
41041	AMI Inferior Wall Initial	41091	AMI NOS, Initial

Both IQIs 15 & 32 measure AMI mortality rates. The ICD-10-CA coding classification does not translate directly into any of these ICD-9-CM codes. In order to capture the information contained in ICD-10-CA codes for patients diagnosed with an AMI, the following ICD-10-CA codes were used for calculating AMI mortality rates.

ICD-10-CA to ICD-9-CM code conversion table

ICD-10-CA	ICD-9-CM
I210 Acute transmural MI of anterior wall	41010 AMI Other Anterior Wall, Episode NOS
I211 Acute transmural MI of inferior wall	41040 AMI Other Inferior Wall Episode NOS
I212 Acute transmural MI of other site	41080 AMI Other Specified Site Episode NOS
I213 Acute transmural MI of unspecified site	41090 AMI Unspecified, Episode Unspecified
I2140 Acute subendocardial MI of anterior wall	41070 Subendocardial AMI, Episode NOS
I2141 Acute subendocardial MI of inferior wall	41070 Subendocardial AMI, Episode NOS
I2142 Acute subendocardial MI of other sites	41070 Subendocardial AMI, Episode NOS
I2149 Acute subendocardial MI, unspecified site	41070 Subendocardial AMI, Episode NOS
I219 AMI unspecified	41090 AMI Unspecified, Episode Unspecified

[8] Human Immunodeficiency Virus Disease (ICD-9-CM code 042) is required for calculating Death in low mortality DRGs (PSI 2). ICD-10-CA/CCI contains this information as HIV disease (B24) which is converted to 0429 in ICD-9-CM by CIHI's conversion table. Therefore, all information on HIV required for calculation of PSI 2 was taken from ICD-10-CA/CCI code B24.

B. ICD-9-CCP conversion methodology

In order to use the CMS- and 3M™ APR™ DRG Classification System software as well as the AHRQ IQI and PSI modules, all diagnoses and procedures coded in ICD-9-CCP (FY1997 thru FY2001) were converted to ICD-9-CM codes preceding analysis. This process was undertaken for the *Hospital Report Card: Ontario 2006*, and a detailed description of how these translations were made is available in Appendix J, part B of that report.

Appendix K: Classification of Hospitals

Ontario's hospitals are classified as general hospitals, convalescent hospitals, hospitals for chronic patients, active treatment teaching psychiatric hospitals, active treatment hospitals for alcoholism and drug addiction, or regional rehabilitation hospitals, and are graded as Groups A through V. [1]. All data analysed in The Fraser Institute's *Hospital Report Card* were restricted to Hospitals in Groups A, B and C and are listed below.

[1] Source: Ministry of Health and Long-Term Care, Ontario. A complete list of hospital classifications are available at: <<http://www.health.gov.on.ca/english/public/contact/hosp/hospcode.html#groups>>.

Group A hospitals general hospitals providing facilities for giving instruction to medical students of any university, as evidenced by a written agreement between the hospital and the university with which it is affiliated, and hospitals approved in writing by the Royal College of Physicians and Surgeons for providing post-graduate education leading to certification or a fellowship in one or more of the specialties recognized by the Royal College of Physicians and Surgeons.

Group B hospitals general hospitals having not fewer than 100 beds.

Group C hospitals general hospitals having fewer than 100 beds.

Group A Hospitals—General/Teaching

CITY	HOSPITAL
HAMILTON	HAMILTON HEALTH SCIENCES CORPORATION Chedoke Hospital Site Hamilton General Hospital Site Henderson General Hospital Site McMaster University Medical Centre Site
HAMILTON	ST. JOSEPH'S HEALTHCARE, HAMILTON St. Joseph's Hospital Site
KINGSTON	KINGSTON GENERAL HOSPITAL
KINGSTON	RELIGIOUS HOSPITALLERS OF SAINT JOSEPH OF THE HÔTEL DIEU OF KINGSTON HÔTEL DIEU HOSPITAL
LONDON	LONDON HEALTH SCIENCES CENTRE South Street Site University Site Victoria—Westminster Site
LONDON	ST. JOSEPH'S HEALTH CARE, LONDON Parkwood Site St. Joseph's Health Centre Site Regional Mental Health Care , London Regional Mental Health Care , St. Thomas

CITY	HOSPITAL	
OTTAWA	CHILDREN'S HOSPITAL OF EASTERN ONTARIO	
OTTAWA	THE OTTAWA HOSPITAL / L'HÔPITAL D'OTTAWA Civic Campus General Campus The University of Ottawa Heart Institute Site [2]	[2] Operates under its own legislation but is not legally recognized as a public hospital.
TORONTO	MOUNT SINAI HOSPITAL	
TORONTO	ST. MICHAEL'S HOSPITAL St. Michael's Site	
TORONTO	SUNNYBROOK HEALTH SCIENCES CENTRE Orthopedic and Arthritic Hospital Site Sunnybrook Hospital Site	
TORONTO	THE HOSPITAL FOR SICK CHILDREN	
TORONTO	UNIVERSITY HEALTH NETWORK Ontario Cancer Institute/Princess Margaret Hospital Site Toronto General Hospital Site Toronto Western Hospital Site	
TORONTO	WOMEN'S COLLEGE HOSPITAL	

Group B Hospitals—General > 100 Beds

CITY	HOSPITAL
AJAX	ROUGE VALLEY HEALTH SYSTEM Ajax and Pickering Health Centre Site
BARRIE	THE ROYAL VICTORIA HOSPITAL OF BARRIE
BELLEVILLE	QUINTE HEALTHCARE CORPORATION Belleville Site
BRAMPTON	WILLIAM OSLER HEALTH CENTRE Brampton Site
BRANTFORD	THE BRANTFORD GENERAL HOSPITAL
BROCKVILLE	BROCKVILLE GENERAL HOSPITAL
BURLINGTON	JOSEPH BRANT MEMORIAL HOSPITAL CORPORATION
CAMBRIDGE	CAMBRIDGE MEMORIAL HOSPITAL
CHATHAM	ST. JOSEPH'S HEALTH SERVICES ASSOCIATION OF CHATHAM, INC.
CHATHAM	THE PUBLIC GENERAL HOSPITAL SOCIETY OF CHATHAM

CITY	HOSPITAL
COBOURG	THE NORTHUMBERLAND HEALTH CARE CORPORATION Cobourg Site
CORNWALL	CORNWALL COMMUNITY HOSPITAL McConnell Avenue Site Second Street Site
GUELPH	THE GUELPH GENERAL HOSPITAL
KENORA	LAKE OF THE WOODS DISTRICT HOSPITAL
KITCHENER	GRAND RIVER HOSPITAL CORPORATION Kitchener-Waterloo Health Centre Site
KITCHENER	ST. MARY'S GENERAL HOSPITAL
LINDSAY	THE ROSS MEMORIAL HOSPITAL
MARKHAM	MARKHAM STOUFFVILLE HOSPITAL
MISSISSAUGA	THE CREDIT VALLEY HOSPITAL
MISSISSAUGA	TRILLIUM HEALTH CENTRE Mississauga Site
NEWMARKET	SOUTHLAKE REGIONAL HEALTH CENTRE
NIAGARA FALLS	NIAGARA HEALTH SYSTEM Greater Niagara General Site Ontario Street Site
NORTH BAY	NORTH BAY GENERAL HOSPITAL Scollard Site Maclaren Site
OAKVILLE	HALTON HEALTHCARE SERVICES CORPORATION Oakville Site
ORANGEVILLE	HEADWATERS HEALTH CARE CENTRE Orangeville Site
ORILLIA	ORILLIA SOLDIERS' MEMORIAL HOSPITAL
OSHAWA	LAKERIDGE HEALTH CORPORATION Oshawa Site
OTTAWA	HÔPITAL MONTFORT
OTTAWA	QUEENSWAY CARLETON HOSPITAL
OWEN SOUND	GREY BRUCE HEALTH SERVICES Owen Sound Site
PEMBROKE	PEMBROKE REGIONAL HOSPITAL INC.
PETERBOROUGH	PETERBOROUGH REGIONAL HEALTH CENTRE PRHC Hospital Drive Site PRHC Rogers Street Site

CITY	HOSPITAL
RICHMOND HILL	YORK CENTRAL HOSPITAL
ST. CATHARINES	NIAGARA HEALTH SYSTEM St. Catharines General Site
ST. THOMAS	THE ST. THOMAS ELGIN GENERAL HOSPITAL
SARNIA	LAMBTON HOSPITALS GROUP Sarnia General Site Charlotte Eleanor Englehart Site
SAULT STE. MARIE	SAULT AREA HOSPITAL Sault Area Hospital Site The Plummer Memorial Public Hospital Site
SIMCOE	NORFOLK GENERAL HOSPITAL
STRATFORD	STRATFORD GENERAL HOSPITAL
SUDBURY	HÔPITAL RÉGIONAL DE SUDBURY REGIONAL HOSPITAL Laurentian Site Memorial Site St. Joseph's Health Centre Site
THUNDER BAY	THUNDER BAY REGIONAL HEALTH SCIENCES CENTRE
TIMMINS	TIMMINS AND DISTRICT HOSPITAL / L'HÔPITAL DE TIMMINS ET DU DISTRICT
TORONTO	HUMBER RIVER REGIONAL HOSPITAL Church Street Site Finch Avenue Site Keele Street Site
TORONTO	ROUGE VALLEY HEALTH SYSTEM Centenary Health Centre Site
TORONTO	THE SCARBOROUGH HOSPITAL General Division Site Grace Division Site
TORONTO	WILLIAM OSLER HEALTH CENTRE Etobicoke Site
TORONTO	THE TORONTO EAST GENERAL HOSPITAL
TORONTO	ST. JOSEPH'S HEALTH CENTRE
TORONTO	NORTH YORK GENERAL HOSPITAL General Division Site Branson Division Site
WELLAND	NIAGARA HEALTH SYSTEM Welland Hospital Site

CITY	HOSPITAL
WINDSOR	HÔTEL DIEU GRACE HOSPITAL Hôtel Dieu Site Grace Site
WINDSOR	WINDSOR REGIONAL HOSPITAL Metropolitan Site Western Site
WOODSTOCK	WOODSTOCK GENERAL HOSPITAL

Group C Hospitals – General < 100 Beds

CITY	HOSPITAL
ALEXANDRA	GLENGARRY MEMORIAL HOSPITAL
ALLISTON	THE STEVENSON MEMORIAL HOSPITAL
ALMONTE	ALMONTE GENERAL HOSPITAL
ARNPRIOR	THE ARNPRIOR AND DISTRICT MEMORIAL HOSPITAL
ATIKOKAN	ATIKOKAN GENERAL HOSPITAL
ATTAWAPISKAT	JAMES BAY GENERAL HOSPITAL Attawapiskat Site
BANCROFT	QUINTE HEALTHCARE CORPORATION North Hastings Site
BARRY'S BAY	ST. FRANCIS MEMORIAL HOSPITAL ASSOCIATION
BLIND RIVER	BLIND RIVER DISTRICT HEALTH CENTRE/PAVILLON SANTÉ DU DISTRICT DE BLIND RIVER
BOWMANVILLE	LAKERIDGE HEALTH CORPORATION Bowmanville Site
BRACEBRIDGE	SOUTH MUSKOKA MEMORIAL HOSPITAL CORPORATION
BURK'S FALLS	HUNTSVILLE DISTRICT MEMORIAL HOSPITAL Burk's Falls Site
CAMPBELLFORD	CAMPBELLFORD MEMORIAL HOSPITAL
CARLETON PLACE	THE CARLETON PLACE AND DISTRICT MEMORIAL HOSPITAL
COLLINGWOOD	THE COLLINGWOOD GENERAL AND MARINE HOSPITAL
CHAPLEAU	CHAPLEAU SERVICES DE SANTÉ DE CHAPLEAU HEALTH SERVICES Chapleau General Site
CHESLEY	SOUTH BRUCE GREY HEALTH CENTRE Chesley Site

CITY	HOSPITAL
CLINTON	THE CLINTON PUBLIC HOSPITAL
COCHRANE	THE LADY MINTO HOSPITAL
DEEP RIVER	DEEP RIVER AND DISTRICT HOSPITAL
DRYDEN	DRYDEN REGIONAL HEALTH CENTRE
DUNNVILLE	HALDIMAND WAR MEMORIAL HOSPITAL
DURHAM	SOUTH BRUCE GREY HEALTH CENTRE Durham Site
ELLIOT LAKE	ST. JOSEPH'S GENERAL HOSPITAL ELLIOT LAKE
EMO	See FORT FRANCES
ENGLEHART	ENGLEHART AND DISTRICT HOSPITAL INC.
ESPANOLA	ESPANOLA GENERAL HOSPITAL
EXETER	SOUTH HURON HOSPITAL ASSOCIATION
FERGUS	THE GROVES MEMORIAL COMMUNITY HOSPITAL
FORT ALBANY	JAMES BAY GENERAL HOSPITAL Fort Albany Site
FORT ERIE	NIAGARA HEALTH SYSTEM Douglas Memorial Hospital Site
FORT FRANCES	RIVERSIDE HEALTH CARE FACILITIES INC. La Verendrye Hospital and Health Centre Site Emo Site Rainy River Site
GEORGETOWN	WILLIAM OSLER HEALTH CENTRE Georgetown Site
GERALDTON	GERALDTON DISTRICT HOSPITAL
GODERICH	ALEXANDRA MARINE AND GENERAL HOSPITAL OF GODERICH
GRIMSBY	WEST LINCOLN MEMORIAL HOSPITAL
HAGERSVILLE	THE WEST HALDIMAND GENERAL HOSPITAL
HALIBURTON	HALIBURTON HIGHLANDS HEALTH SERVICES CORPORATION Haliburton Site
HANOVER	HANOVER AND DISTRICT HOSPITAL
HAWKESBURY	HÔPITAL GÉNÉRAL DE HAWKESBURY & DISTRICT GENERAL HOSPITAL INC.
HEARST	HÔPITAL NOTREDAME HOSPITAL (HEARST)
HORNEPAYNE	HORNEPAYNE COMMUNITY HOSPITAL

CITY	HOSPITAL
HUNTSVILLE	HUNTSVILLE DISTRICT MEMORIAL HOSPITAL Huntsville Site
INGERSOLL	THE ALEXANDRA HOSPITAL INGERSOLL
IROQUOIS FALLS	ANSON GENERAL HOSPITAL
KAPUSKASING	SENSENBRENNER HOSPITAL
KEMPTVILLE	KEMPTVILLE DISTRICT HOSPITAL
KINCARDINE	SOUTH BRUCE GREY HEALTH CENTRE Kincardine Site
KIRKLAND LAKE	KIRKLAND AND DISTRICT HOSPITAL
LEAMINGTON	LEAMINGTON DISTRICT MEMORIAL HOSPITAL
LION'S HEAD	LION'S HEAD GREY BRUCE HEALTH SERVICES Lion's Head Site
LISTOWEL	THE LISTOWEL MEMORIAL HOSPITAL
LITTLE CURRENT	MANITOULIN HEALTH CENTRE Little Current Site
MANITOUWADGE	MANITOUWADGE GENERAL HOSPITAL
MARATHON	WILSON MEMORIAL GENERAL HOSPITAL
MARKDALE	GREY BRUCE HEALTH SERVICES Markdale Site
MATHESON	BINGHAM MEMORIAL HOSPITAL
MATTAWA	MATTAWA GENERAL HOSPITAL INC.
MEAFORD	GREY BRUCE HEALTH SERVICES Meaford Site
MIDLAND	HURONIA DISTRICT HOSPITAL
MILTON	HALTON HEALTHCARE SERVICES CORPORATION Milton Site
MINDEMOYA	MANITOULIN HEALTH CENTRE Mindemoya Site
MINDEN	HALIBURTON HIGHLANDS HEALTH SERVICES CORPORATION Minden Site
MOUNT FOREST	NORTH WELLINGTON HEALTH CARE CORPORATION Mount Forest Site
NAPANEE	LENNOX AND ADDINGTON COUNTY GENERAL HOSPITAL
NEWBURY	FOUR COUNTIES HEALTH SERVICES CORPORATION

CITY	HOSPITAL
NEW LISKEARD	TEMISKAMING HOSPITAL
NIAGARA ON THE LAKE	NIAGARA HEALTH SYSTEM Niagara on the Lake Hospital Site
NIPIGON	NIPIGON DISTRICT MEMORIAL HOSPITAL
PALMERSTON	NORTH WELLINGTON HEALTH CARE CORPORATION Palmerston Site
PARIS	THE WILLETT HOSPITAL
PARRY SOUND	WEST PARRY SOUND HEALTH CENTRE
PERTH	PERTH AND SMITH FALLS DISTRICT HOSPITAL Great War Memorial Hospital Site
PETROLIA	LAMBTON HOSPITALS GROUP Charlotte Eleanor Englehart Site
PICTON	QUINTE HEALTHCARE CORPORATION Picton Site
PORT COLBORNE	NIAGARA HEALTH SYSTEM Port Colborne General Site
PORT PERRY	LAKERIDGE HEALTH CORPORATION Port Colborne Site
RAINY RIVER	See FORT FRANCES
RED LAKE	THE RED LAKE MARGARET COCHENOUR TOWNSHIP MEMORIAL HOSPITAL CORPORATION
RENFREW	RENFREW VICTORIA HOSPITAL
RICHARD'S LANDING	SAULT AREA HOSPITAL Richard's Landing Site
ST. MARYS	ST. MARYS MEMORIAL HOSPITAL
SEAFORTH	SEAFORTH COMMUNITY HOSPITAL
SIOUX LOOKOUT	SIOUX LOOKOUT MENO-YA-WIN HEALTH CENTRE 5th Avenue Site 7th Avenue Site
SMITH FALLS	PERTH AND SMITH FALLS DISTRICT HOSPITAL
SMOOTH ROCK	SMOOTH ROCK FALLS HOSPITAL CORPORATION FALLS
SOUTHAMPTON	GREY BRUCE HEALTH SERVICES Southampton Site
STRATHROY	STRATHROY MIDDLESEX GENERAL HOSPITAL
STURGEON FALLS	HÔPITAL GÉNÉRAL DE NIPISSING OUEST/THE WEST NIPISSING GENERAL HOSPITAL

CITY	HOSPITAL
TERRACE BAY	THE MCCAUSLAND HOSPITAL
THESSALON	SAULT AREA HOSPITAL Thessalon Site
TILLSONBURG	TILLSONBURG DISTRICT MEMORIAL HOSPITAL
TRENTON	QUINTE HEALTHCARE CORPORATION Trenton Site
UXBRIDGE	UXBRIDGE LAKERIDGE HEALTH CORPORATION Uxbridge Site
WALKERTON	SOUTH BRUCE GREY HEALTH CENTRE Walkerton Site
WALLACEBURG	SYDENHAM DISTRICT HOSPITAL
WAWA	LADY DUNN HEALTH CENTRE
WIARTON	GREY BRUCE HEALTH SERVICES Warton Site
WINCHESTER	WINCHESTER DISTRICT MEMORIAL HOSPITAL
WINGHAM	WINGHAM AND DISTRICT HOSPITAL